

SSER

Task: Allegation A-336

Ref. No.: 4-84-A-47a

Characterization: It is alleged that skewed angles were not taken into account by Tompkins-Beckwith (T-B) in the specification of weld size for pipe supports having members joined at various angles.

Assessment of Allegation: During the LP&L Quality Assurance (QA) system turnover audit of the low pressure safety injection system from April 26 to June 2, 1982, undersized pipe support welds were identified. The findings are documented in the LP&L Site Audit Report WS3-82-40, dated June 4, 1982. Ebasco Nonconformance Report (NCR) W3-4010, dated June 28, 1982, was subsequently issued to direct T-B to reinspect 4,552 pipe supports for the purpose of documenting each support's actual physical configuration.

Ebasco Site Support Engineering utilized this configuration data to evaluate the adequacy of the as-found condition of the welds in accordance with the requirements of American Welding Society (AWS) Structural Welding Code AWS D1.179, Appendix B, "Effective Throats of Fillet Welds in Skewed T-Joints." Ebasco also issued Revision No. 7 to Field Change Request (FCR) No. MP-1153 which contained a welding guideline table that was a tabulation of required weld sizes for various dihedral angles developed from the equivalent fillet weld leg size factors contained in the AWS standard. The installation of supports subsequent to the issuance of the FCR was performed in accordance with the provisions of the welding guideline table.

The NRC staff verified compliance with AWS requirements for skewed-weld designs by randomly inspecting documentation and as-built conditions in a number of supports. A support in the component cooling water system was also selected specifically for verifying its design details. NRC's review of the calculation package indicated compliance with the AWS standard.

NRC reviewed the Ebasco procedure used to review the records generated by T-B prior to turnover to LP&L. This document, QAIRG3 No. 11-H, contains a Hanger Technical Review Checklist which states, as attribute No. 14, that, "Skew T-weld joint criteria must be verified to FCR-MP-1553." Based on the items reviewed, the NRC staff has concluded that skewed angle welds have been properly taken into account, either in response to the NCR or in the implementation of the FCR. NRC discussed its findings with the allegor, and he agreed and expressed satisfaction with the resolution.

The NRC staff concluded that this allegation has neither safety significance nor generic implications.

Potential Violations: None.] 4

Actions Required: None.

References

1. LP&L Site Audit Report No. W35-82-40, June 4, 1982.
2. Nonconformance Report No. W3-4010, June 28, 1982.
3. AWS Structural Welding Code, AWS D1.179, Appendix B, "Effective Throats of Fillet Welds in Skewed T-Joints."
4. Field Change Request No. MP-1553, Revision No. 7.
5. QAIRG3 No. 11-H.

Statement Prepared By:

J. I. Tapia

Date _____

Reviewed By:

Team Leader

Date _____

Reviewed By:

Site Team Leader(s)

Date _____

Approved By:

Task Management

Date _____

Document Name:
SSER A-336

Requestor's ID:
PATTYN

Author's Name:
J. I. Tapia

Document Comments:

✓ 4
FINAL
Rev. 2
6.19.84

FINAL SSER ROUTING

A-336

Revision :	0	1	2	3
Denny Crutchfield	<i>DMC 6/14</i>			
Jim Gagliardo	✓			

FINAL

was 6/8

FINAL SSER ROUTING

Revision :	0	1	2	3
Denny Crutchfield				
Jim Gagliardo	<i>✓</i>			

Document Name:
SSER A-336

Requestor's ID:
PATTYN

Author's Name:
J. I. Tapia

Document Comments:

FINAL
6.19.84
Rev. 2

SSER

✓
4

Task: Allegation A-336

Ref. No.: 4-84-A-47a

Characterization: It is alleged that skewed angles were not taken into account by Tompkins-Beckwith (T-B) in the specification of weld size for pipe supports having members joined at various angles.

Assessment of Allegation: During the LP&L Quality Assurance (QA) system turnover audit of the Low pressure safety injection system from April 26 to June 2, 1982, undersized pipe support welds were identified. The findings are documented in the LP&L Site Audit Report WS3-82-40, dated June 4, 1982. Ebasco Nonconformance Report (NCR) W3-4010, dated June 28, 1982, was subsequently issued to direct T-B to reinspect 4,552 pipe supports for the purpose of documenting each support's actual physical configuration.

Ebasco Site Support Engineering utilized this configuration data to evaluate the adequacy of the as-found condition in accordance with the requirements of American Welding Society (AWS) Structural Welding Code AWS D1.179, Appendix B, "Effective Throats of Fillet Welds in Skewed T-Joints." Ebasco also issued Revision No. 7 to Field Change Request (FCR) No. MP-1153 which contained a welding guideline table that was a tabulation of required weld sizes for various dihedral angles developed from the equivalent fillet weld leg size factors contained in the AWS standard. The installation of supports subsequent to the issuance of the NCR was performed in accordance with the provisions of the welding guideline table.

The NRC staff verified compliance with AWS requirements for skewed-weld designs by randomly selecting a support in the component cooling water system and verifying its design. NRC's review of the calculation package indicated compliance with the AWS standard.

NRC reviewed the Ebasco procedure used to review the records generated by T-B prior to turnover to LP&L. This document, QAIRG3 No. 11-H, contains a Hanger Technical Review Checklist which states, as attribute No. 14, that, "Skew T-weld joint criteria must be verified to FCR-MP-1553." Based on the items reviewed, the NRC staff has concluded that skewed angle welds have been properly taken into account, either in response to the NCR or in the implementation of the FCR. NRC discussed its findings with the allegor, and he agreed and expressed satisfaction with the resolution.

The NRC staff concluded that this allegation has neither safety significance nor generic implications.

Potential Violations: None.

4

Actions Required: None.

Document Name:
SSER A-336

Requestor's ID:
CONNIE

Author's Name:
J. I. Tapia

Document Comments:

~~FINAL~~
was
6/16/84

~~RAFI~~
was
8/16/84

✓
4

SSER

Task: Allegation A-336

Ref. No.: 4-84-A-47a

Characterization: It is alleged that skewed angles were not taken into account by Tompkins-Beckwith (T-B) in the specification of weld size for pipe supports having members joined at various angles.

Assessment of Allegation: During the LP&L Quality Assurance (QA) system turnover audit of the low pressure safety injection system from April 26 to June 2, 1982, undersized pipe support welds were identified. The findings are documented in the LP&L Site Audit Report WS3-82-40, dated June 4, 1982. Ebasco Nonconformance Report (NCR) W3-4010, dated June 28, 1982, was subsequently issued to direct T-B to reinspect 4,552 pipe supports for the purpose of documenting each support's actual physical configuration.

Ebasco Site Support Engineering utilized this configuration data to evaluate the adequacy of the as-found condition in accordance with the requirements of American Welding Society (AWS) Structural Welding Code AWS D1.179, Appendix B, "Effective Throats of Fillet Welds in Skewed T-Joints." Ebasco also issued Revision No. 7 to Field Change Request (FCR) No. MP-1153 which contained a welding guideline table that was a tabulation of required weld sizes for various dihedral angles developed from the equivalent fillet weld leg size factors contained in the AWS standard. The installation of supports subsequent to the issuance of the NCR was performed in accordance with the provisions of the welding guideline table.

The NRC staff verified compliance with AWS requirements for skewed-weld designs by randomly selecting a support in the component cooling water system and verifying its design. NRC's review of the calculation package indicated compliance with the AWS standard.

NRC reviewed the Ebasco procedure used to review the records generated by T-B prior to turnover to LP&L. This document, QAIRG3 No. 11-H, contains a Hanger Technical Review Checklist which states, as attribute No. 14, that, "Skew T-weld joint criteria must be verified to FCR-MP-1553." Based on the items reviewed, the NRC staff has concluded that skewed angle welds have been properly taken into account, either in response to the NCR or in the implementation of the FCR. NRC discussed its findings with the allegor, and he agreed and expressed satisfaction with the resolution.

The NRC staff concluded that this allegation has neither safety significance nor generic implications.

Potential Violations: None. ⁴

Actions Required: None.

References

1. LP&L Site Audit Report No. W35-82-40, June 4, 1982.
2. Nonconformance Report No. W3-4010, June 28, 1982.
3. AWS Structural Welding Code, AWS D1.179, Appendix B, "Effective Throats of Fillet Welds in Skewed T-Joints."
4. Field Change Request No. MP-1553, Revision No. 7.
5. QAIRG3 No. 11-H.

Statement Prepared By:

J. I. Tapia

Date _____

Reviewed By:

Team Leader

Date _____

Reviewed By:

Site Team Leader(s)

Date _____

Approved By:

Task Management

Date _____

✓4
FILE
A-336

SSER

Task: Allegation A-336

Ref. No.: 4-84-A-47a

Characterization: It is alleged that skewed angles were not taken into account by Tompkins-Beckwith (T-B) in the specification of weld size for pipe supports having members joined at various angles.

Assessment of Allegation: During the LP&L Quality Assurance (QA) system turnover audit of the low pressure safety injection system from April 26 to June 2, 1982, undersized pipe support welds were identified. The findings are documented in the LP&L Site Audit Report WS3-82-40, dated June 4, 1982. Ebasco Nonconformance Report (NCR) W3-4010, dated June 28, 1982, was subsequently issued to direct T-B to reinspect 4,552 pipe supports for the purpose of documenting each support's actual physical configuration.

Ebasco Site Support Engineering utilized this configuration data to evaluate the adequacy of the as-found condition ^{AS THE WELDS} in accordance with the requirements of American Welding Society (AWS) Structural Welding Code AWS D1.179, Appendix B, "Effective Throats of Fillet Welds in Skewed T-Joints." Ebasco also issued Revision No. 7 to Field Change Request (FCR) No. MP-1153 which contained a welding guideline table that was a tabulation of required weld sizes for various dihedral angles developed from the equivalent fillet weld leg size factors contained in the AWS standard. The installation of supports subsequent to the issuance of the NCR was performed in accordance with the provisions of the welding guideline table.

INSPECTING DOCUMENTATION AND AS-BUILT CONDITIONS IN A NUMBER OF SUPPORTS.
The NRC staff verified compliance with AWS requirements for skewed-weld designs by randomly ~~selecting~~ ^{selecting} a support in the component cooling water system ^{WAS ALSO} and verifying its design. ^{SELECTED} NRC's review of the calculation package indicated ^{SPECIFICALLY} compliance with the AWS ^{FOR} standard. ^{DETAILS.}

NRC reviewed the Ebasco procedure used to review the records generated by T-B prior to turnover to LP&L. This document, QAIRG3 No. 11-H, contains a Hanger Technical Review Checklist which states, as attribute No. 14, that, "Skew T-weld joint criteria must be verified to FCR-MP-1553." Based on the items reviewed, the NRC staff has concluded that skewed angle welds have been properly taken into account, either in response to the NCR or in the implementation of the FCR. NRC discussed its findings with the allegor, and he agreed and expressed satisfaction with the resolution.

The NRC staff concluded that this allegation has neither safety significance nor generic implications.

Potential Violations: None.] 4

Actions Required: None.

References

1. LP&L Site Audit Report No. W35-82-40, June 4, 1982.
2. Nonconformance Report No. W3-4010, June 28, 1982.
3. AWS Structural Welding Code, AWS D1.179, Appendix B, "Effective Throats of Fillet Welds in Skewed T-Joints."
4. Field Change Request No. MP-1553, Revision No. 7.
5. QAIRG3 No. 11-H.

Statement Prepared By: J. I. Tapia
Date

Reviewed By: Team Leader
Date

Reviewed By: Site Team Leader(s)
Date

Approved By: Task Management
Date

Document Name:
SSER A-336

Requestor's ID:
CONNIE

Author's Name:
J. I. Tapia

Document Comments:

FINAL
acc 6/16/84



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

June 13, 1984

Docket No. 50-382

Mr. J. M. Cain
President & Chief Executive Officer
Louisiana Power and Light Company
317 Baronne Street
New Orleans, Louisiana 70160

Dear Mr. Cain:

SUBJECT: WATERFORD 3 REVIEW

On April 2, 1984, the staff began an intensive review effort largely conducted onsite, designed to complete those issues necessary for the staff to reach its licensing decision on Waterford Unit 3. These issues covered a number of areas including allegations of improper construction practices at the facility. As we indicated to you, the staff would promptly notify you of issues that could potentially affect the safe operation of the plant.

We have recently identified the items listed in the enclosure that have potential safety implications for which we require additional information. It should be noted that they are being provided to you before the NRC staff publication of its SSER which will document its assessment of the significance of these and all of the other issues examined. The issues in the enclosure represent an extensive staff audit of information related to the plant.

As a result, you are requested to propose a program and schedule for a detailed and thorough assessment of the concerns. This program plan and implementation schedule will be evaluated by the staff before consideration of issuance of an operating license for Waterford 3. This program plan should include and address the cause of each of these potential problems identified; the generic implications and the root cause of the concern on

D. CRUICKSHANK 314

DENNY,

10/24

ATTACHED PER YOUR REQUEST, IS A
COPY OF MY FILES ON THE WATERFORD EFFORT
FOR USE IN RESPONDING TO FOIA REQUEST

JACK STRONINGER

488-1126

84#6210344

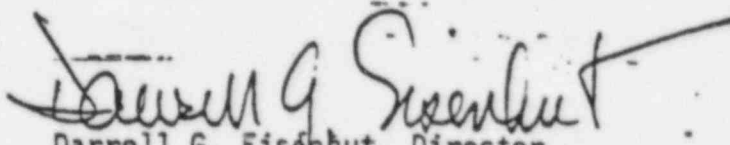
Mr. J. M. Cain

- 2 -

June 13, 1984

other safety-related systems, programs or areas; and the collective significance of these deficiencies. Your program plan should include the proposed LP&L action to assure that such problems will be precluded from occurring in the future.

Sincerely,

A handwritten signature in dark ink, appearing to read "Darrell G. Eisenhower", is written over a horizontal line.

Darrell G. Eisenhower, Director
Division of Licensing
Office of Nuclear Reactor Regulation

Enclosure:
As stated

cc w/enclosure:
See next page

Mr. J. M. Cain

- 3 -

June 13, 1984

Mr. R. S. Leddick
Vice President - Nuclear Operations
Louisiana Power & Light Company
142 Delaronde Street
New Orleans, Louisiana 70174

W. Malcolm Stevenson, Esq.
Monroe & Leman
1432 Whitney Building
New Orleans, Louisiana 70130

Mr. E. Blake
Shaw, Pittman, Potts and Trowbridge
1800 M Street, NW
Washington, DC 20036

Mr. Gary L. Groesch
2257 Bayou Road
New Orleans, Louisiana 70119

Mr. F. J. Drummond
Project Manager - Nuclear
Louisiana Power and Light Company
142 Delaronde Street
New Orleans, Louisiana 70174

Mr. K. W. Cook
Nuclear Support and Licensing Manager
Louisiana Power & Light Company
142 Delaronde Street
New Orleans, Louisiana 70174

Luke Fontana, Esq.
824 Esplanade Avenue
New Orleans, Louisiana 70116

Stephen M. Irving, Esq.
535 North 6th Street
Baton Rouge, Louisiana 70802

Resident Inspector/Waterford NPS
P. O. Box 822
Killona, Louisiana 70066

Mr. Jack Fager
Middle South Services, Inc.
P. O. Box 61000
New Orleans, Louisiana 70161

Regional Administrator - Region IV
U. S. Nuclear Regulatory Commission
611 Ryan Plaza Drive
Suite 1000
Arlington, Texas 76012

Carole H. Burstein, Esq.
445 Walnut Street
New Orleans, Louisiana 70118

POTENTIAL SAFETY IMPLICATIONS1. Inspection Personnel Issues

As a part of the NRC staff's review, the credentials of quality assurance and quality control inspectors were examined. Included in this effort were the verification of previous job experience and qualifications and certification of personnel as inspectors.

The following items were found: -----

- (1) NRC reviewed inspector certifications for 37 of the 100 Mercury QC inspectors, including certifications for all Level III personnel. Twelve inspector certifications were found questionable due to insufficient education or experience.
- (2) The certification records of 38 Tompkins-Beckwith (T-B) QC inspectors were selected at random and reviewed. Fourteen inspector certifications were found questionable due to insufficient education or experience.
- (3) A 30% sample by the staff of inspector certifications of the Mercury QC work force revealed that no verification of past employment was documented. A sample by the staff of inspector certifications of the Tompkins-Beckwith QC work force produced similar results.

The safety significance of these findings is that unqualified inspectors may have inspected safety-related systems, thereby rendering verification of the quality of these systems indeterminate. LP&L shall: (1) verify the professional credentials of 100% of the site QA/QC personnel, including supervisors and managers, (2) reinspect the work performed by inspectors found unqualified, and (3) verify the proper certification of the remaining site QA/QC personnel to ANSI N45.2.6-1973.

2. Missing N1 Instrument Line Documentation

The staff examined the documentation concerning installation of safety-related N1 instrument lines. Part of that review dealt with the situation where there is a change of design classification for systems. As a result of the staff review it was determined that communications between LP&L and Ebasco prompted a revision to be written by Ebasco to an LP&L drawing to clarify the "class break" for N1 instrument lines. The revision imposed ASME Class requirements for all installations between the process piping and the instruments for instrument lines installed after April 7, 1982. Prior to the revision a class break was defined to show the location where ASME class stopped and ANSI B31.1 applied.

Although ANSI B31.1 does not relate to records retention, 10 CFR 50 Appendix B does require special process controls, traceability, installation and inspection records. Therefore, for locally mounted N1 instruments, even though they were installed prior to April 7, 1982,

these records could not be located. Examples of the instruments lines with no supporting installation and inspection records for zones classified as ANSI B31.1 are LT-SI-0305B; LT-SI-0305D; PS-CH-0224X; PS-CH-0224Y and PS-CH-0224Z.

Examples of the type of deficient data are weld reports, welder identification, weld filler material, base material and weld inspection results.

The NRC staff concluded that based upon the lack of quality records, for instrumentation installation to B31.1 the requirements of 10 CFR 50, Appendix B and the related other QA program elements may not have been complied with.

The lack of documentation to demonstrate the quality of installation of these safety related lines calls into question the acceptability of these installed components.

LP&L shall; (1) Provide the missing documentation required by 10 CFR 50 Appendix B for the B31.1 instrumentation for local mounted instruments; (2) Review other design changes and documentation for all safety-related N1 instrumentation systems to assure all system installations were properly documented and inspected; and (3) If the documentation cannot be located, action must be taken to assure affected portions of safety-related system comply with NRC requirements.

3. Instrumentation Expansion Loop Separation

As a part of its review of NCRs the staff identified a concern in NCR W3-7702. This NCR was written as a result of Mercury OCR Package 1782. Drawing 172-L-012-C Revision 4 had a handwritten note on it identifying two lines DPR-RC-9116 SMB (HP) and DPT-RC-9116 SMA (HP) where the separation criteria had been violated. The violation occurs where these instrument lines from different trains leave the tube tracks and form an expansion loop before returning to the continuation of the tube track. Lack of separation could result in failure of redundant lines that could prevent a safety function.

LP&L shall correct the separation criteria violation found in System 52A. They shall also provide a program for review of other safety-related systems for separation criteria violations and take the necessary corrective actions.

4. Lower Tier Corrective Actions Are Not Being Upgraded to NCRs

The staff reviewed the Corrective Action system to verify if lower tier corrective action documents were being properly upgraded to NCRs as required by 10 CFR Part 50, Appendix B Criteria XV and XVI. Specifically the staff looked at a number of Field Change Requests (FCRs), Design Change Notices (DCNs), and Engineering Deficiency Notices (EDNs) selected

from printouts of safety-related equipment and systems document issuance logs. The selected documents were reviewed for content and basis for issuance (i.e., before the fact design change or after the fact nonconformance). Finally a walkdown was performed to verify proper identification and change control completion. In addition
----- Tompkins-Beckwith (T-B) Discrepancy Notices (DNs) were reviewed.

As a result of its review the staff found that the following issues.

- a. Field Change Requests - Sixty-three FCRs and 21 revisions to FCRs were evaluated. It appears as though 35 should have been NCRs and another 4 reflected conditions that may have warranted an NCR. The list below provides examples of FCRs that should have been NCRs....

F-MP-1818	F-AS-1631
F-AS-3698	F-E-3089
F-AS-3648	F-MP-2138
F-AS-2338	F-MP-2151
F-MP-1434	F-E-2288

- b. Design Change Notices - Fourteen DCNs and 5 revisions to DCNs were reviewed. It appears as though 4 of those should have been upgraded to NCRs. Listed below are examples of these.

DCN-703 and Revision 1
DCN-1C-478
DCN-ME-30
DCN-E-790

It appears as though the problems identified in DCN-703 are related to FCR-MP-2138 and may have been reportable under 10 CFR Parts 21 or 50.55(e).

- c. Engineering Discrepancy Notice (EDNs) - Seventy-six EDNs were reviewed for proper identification and control. Of those 76, it appears as though 51 of those should have been NCRs. Examples of these are listed below.

EDN-EC-1476
EDN-E-1548
EDN-EC-1502
EDN-EC-1479

In addition during the review, another 35 were "voided" with no action taken. The voiding action was performed by a clerk. Examples of voided EDNs are as follows:

EDN-EC-0630
EDN-EC-1175
EDN-EC-1176
EDN-EC-1140

- d. Tompkins-Beckwith - The staff reviewed a sample of the handling of information requests and Discrepancy Notices by Ebasco. As a result of that review it appeared that a number of these items should have been upgraded to NCRs. Examples of these are listed below.

W-6519	W-5755
W-6183	W-742
W-6322	W-5917
W-3656*	W-381
W-1876	W-5824*
W-4112	W-5047
W-5692	W-5416
W-6243	W-5916
W-6349	W-2105
W-728	W-4968*
W-4648*	W-4969*

The asterisked (*) items all related to incorrect heat numbers being entered incorrectly or clerical errors being made on rod slips.

In summary, the staff found that the QA program requirements for nonconformance identification, control and proper action do not appear to have been complied with.

LP&L shall review all FCRs, DCNs EDNs, and T-B DNs to assure that proper corrective action was taken, including an adequate review by QA. This action shall include the steps required by 10 CFR 50, Appendix B, Criterion XVI, Corrective Action, and for Construction Deficiency Reporting, 50.55(e). Also included in this review shall be the examination of improper voiding of all other design changes or discrepancies notices that affected safety-related systems or that were misclassified as non-safety related.

5. Vendor Documentation - Conditional Releases

As a part of the staff review of the QA program, the staff evaluated the Ebasco vendor QA program. In assessing this program, the staff specifically looked at the receipt inspection program and the conditional release system.

As a result of its evaluation, the staff found certain deficiencies with the handling of conditional certification of equipment (C of E) for Combustion Engineering supplied equipment. For example, one conditional C of E for the reactor vessel and internals was issued because as-built drawings, material certifications, and the fabrication plans had not been forwarded when the equipment was delivered to LP&L in 1976. The missing documents were sent to Ebasco sometime in 1978, according to the Ebasco quality records supervisor, but were apparently lost prior to being placed in the Ebasco document control system. The conditional

certification of equipment was found when a check of all files was made in April or May 1984. The missing documents have been requested from CE, and a deficiency report was issued and placed on a master deficiency list. This problem has existed since July 20, 1976.

The safety significance of this is that problems with the vendor QA records could affect installed safety related equipment. L&L shall examine their records and determine if all conditional certifications of equipment have been identified, reviewed, and promptly resolved.

6. Dispositioning of Nonconformance and Discrepancy Reports

The staff conducted a review of Ebasco nonconformance reports (NCRs) randomly selected from the Ebasco QA vault and the NCR tracking system. The selected NCRs were reviewed for content, compliance with procedures, accuracy, completeness of the disposition and final closure. Of the NCRs reviewed it is the staff's judgement that approximately one third contained questionable dispositions. Other NCRs were found still open.

The implied safety significance is that improperly dispositioned NCRs or lack of NCR closure could place the quality of installation in question.

For example, Ebasco NCR W3-5564 identifies that welds were painted before the final weld inspection was performed. The NCR was closed out with a letter stating that the final inspection will be performed to inspect only for undersizing and lack of weld material where installation drawing calls for weld material. No paint was to be removed therefore the inspector could not inspect for welding defects.

The NCRs reviewed by the staff dealt with a wide variety of issues. The following is a list of example Ebasco NCRs that the staff feels contain questionable dispositions or exceeded closure time requirements.

Ebasco W3 NCRs

NCR-7139	NCR-7177	NCR-3912	NCR-7182	NCR-5563
NCR-7181	NCR-7184	NCR-6159	NCR-6723	NCR-3919
NCR-7547	NCR-6221	NCR-1650	NCR-6511	NCR-6623
NCR-4219	NCR-5586	NCR-7432	NCR-7180	NCR-4137
NCR-6165	NCR-4088	NCR-7099	NCR-6786	NCR-6597
NCR-7533	NCR-7179	NCR-7140	NCR-5565	

The staff also found similar type problems related to Mercury NCRs in that the dispositions were questionable; supporting documentation could not be located; rework appears to have not been accomplished; NCRs were not processed; a sufficient basis was not provided; and closure basis was inadequate.

The following NCRs fall into these categories:

Mercury NCRs

180	420	528	568	625
255	429	540	591	656
268	438	554	594	658
363	487	560	595	
380	491	565	614	

Additionally during this review the staff found problems with Ebasco discrepancy reports (DRs) in that it appears some DRs should have been elevated to NCRs; closure references were incorrect or inappropriate; closure action was improper; documentation was inaccurate; closure was via a DR, should have been an NCR; disposition failed to address the discrepancy; and the disposition of "use-as-is" had insufficient basis.

The following DRs fall into these categories:

Ebasco DRs Related to Turnover Packages

Q2-CS-1C-27	BD-1C-1143
Q2/3-FW/1C-851	Q1-RC-LWS-RC-2
Q2-SI-1C-89	LW3-RC-29
QMC-APQ-P47E	Q2-LW3-SI-10F/E
CH-1C-342	CC-1C-6

The staff concludes that some Ebasco and Mercury NCRs and Ebasco DRs were questionably dispositioned and that LP&L shall (1) Propose a program that assures that all NCRs and DRs are appropriately upgraded and adequately dispositioned and corrective action completed, and (2) correct any problem detected.

7. Backfill Soil Densities

The staff found that records are missing for the in-place density test of backfill in Area 5 (first 5' starting at Elevation -41.25'). These documents are important because the seismic response of the plant is a function of the soil densities.

LP&L shall (1) Conduct a review of all soil packages for completeness and technical adequacy and locate all records and provide closure on technical questions, or (2) conduct a review of all soil packages for completeness and technical adequacy and where soil volumes cannot be verified by records as meeting criteria, perform and document actual soil conditions by utilizing penetration tests or other methods, or (3) Justify by analysis that the soil volumes with missing records, or technical problems as defined after the records review, are not critical in the structural capability of the plant under seismic loads.

8. Visual Examination of Shop Welds During Hydrostatic Testing

The staff's review of hydrostatic tests conducted by Tompkins-Beckwith (T-B) for their installed ASME Class 1 and Class 2 piping systems found a lack of proof of the visual inspection of all shop welds during the tests. Inspection of all welds for leakage is required by the ASME Code and is essential to ensure the structural integrity of the piping system. LP&L shall provide documented evidence that shop welds were indeed inspected during the hydro tests. If the appropriate inspection documents do not exist or cannot be located, LP&L shall submit a statement attesting to shop weld inspection by the responsible personnel of LP&L or Ebasco who had witnessed the hydro tests.

9. Welder Certification

The staff reviewed the records for the installation of the supports for certain of the instrumentation cabinets in the Reactor Containment Building (RCB). The review included an examination of procurement records for the support material, weld rod control documents, welder certification records, and QC inspection records.

Based on the staff review it appears that documentation is missing on the support welds and it is not clear that the welders were certified for all of the weld positions used. Thus the quality of the supports for the instrument cabinets are indeterminate.

LP&L shall attempt to locate the missing documents and determine if the welders were appropriately certified. If the documentation cannot be located, appropriate action must be taken to assure the quality of the cabinet supports.

10. Inspector Qualifications (J. A. Jones and Fegles)

The NRC staff reviewed the qualification and certifications of QC inspectors in the civil/structural area. The review included the qualifications of four Ebasco inspectors, five J. A. Jones inspectors and eight Fegles inspectors. The inspector qualifications were compared against the requirements of ANSI N45.2.6 and the contractor's procedures.

The staff found that four of the five J. A. Jones inspectors and two of the eight Fegles inspectors failed to meet the applicable certification requirements related to relevant experience. Since these inspectors were involved in the inspection of safety-related activities, the fact that they may not have been qualified to perform such inspections, renders the quality of the inspected construction activities as indeterminate.

LP&L shall review all inspector qualifications and certifications for J. A. Jones and Fegles against the project requirements and provide the information in such a form that each requirement is clearly shown to have been met by each inspector. If an inspector is found to not meet the qualification requirements, the licensee shall then review the records to determine the inspections made by the unqualified individuals and provide a statement on the impact of the deficiencies noted on the safety of the project.

11. Cadwelding

The staff reviewed the Cadweld activities related to the deficiencies identified in NCR-W3-6234. The staff is concerned that the applicant has provided only limited data (in other than the raw form) to the NRC on the statistics of the Cadweld testing program conducted during construction. The data provided stated that for the base mat 3,673 splices were made with 81 tests run, showing an average strength of 95,397 psi with a range of 60,750 - 107,051 psi. For the entire project the applicant has stated that 14,293 splices were made of which 591 were tested with 6 of those failing to meet tensile requirements. It is noted that the above NCR has been reopened as a result of the CAT inspection and all issues have not been resolved.

LP&L shall provide the Cadweld data for the project in such a form that it can be readily compared to the acceptance criteria used for the Waterford 3 project. This will require breaking down the Cadweld data by building or structural element such as the base mat, NPIS walls that are not part of RAB or FHB, containment interior structures etc. Additionally, the data should be broken down by test program type (production or sister), bar size, bar position and cadwelder. Data shall be provided in each category on total splices made, visual rejects, production tests and failures, and sister tests and failures. Data shall also be provided on welder qualification and requalification including dates.

Based on discussions with LP&L representatives the NRC staff has been informed that efforts in this area are underway, but this information is needed for staff review.

12. Main Steamline Framing Restraints

As part of the NRC staff's review, the installation and inspection of the main steamline framing restraints above the steam generators was examined to determine if the as-built drawings reflect the actual installation. The NRC staff found no problems with as-built conditions, but found that several bolted connections had not been inspected (or documented) for the framing. The failure to perform (or document) the inspections render the quality of these framing restraints as indeterminate.

Based on discussions with LP&L representatives the staff was informed that the subject inspections are in progress. LP&L shall complete the inspections of the restraints and make the documentation of such inspections available to the staff.

13. Missing NCRs

During the NRC's review of Ebasco's NCR Processing System the card index file of NCRs was examined and the staff noted that there are missing reports in the consecutively numbered NCRs. Specifically W3-27, 814, 859, 981, 1053, 1102, 1109, 1228, 1349, and 1438 are missing from your card index file. Others were also noted to be missing from the Ebasco QA vault.

LP&L shall (1) obtain the missing NCRs, explain why these NCRs were not maintained in the filing system, review them for proper voiding, and (2) assure that when an issue is raised to an NCR, it is then properly filed for tracking and closure.

14. J. A. Jones Speed Letters and EIRs

During the Ebasco QA review of J. A. Jones speed letters and engineering information requests, several items that could affect plant safety were noted. Based on its sample of these actions, the staff does not expect that any of these items will significantly affect plant safety. Nevertheless, the applicant should complete the actions identified in these reviews and issues raised shall be resolved promptly.

15. Welding of "D" Level Material Inside Containment

The staff reviewed the welding of "D" level material for containment attachments. The containment spray system structural component welds were chosen for specific detailed review. The welds on the containment spray piping supports were checked for weld rod traceability and welder identification and certification. The applicant was unable to produce the documentation sought for the staff review.

The applicant shall (1) locate the documentation and verify the adequacy of the information, or (2) perform a material analysis and NDE work, or (3) rework the welds. The staff shall be promptly informed of the applicant's approach and the documentation shall be made available for staff review.

16. Surveys and Exit Interviews of QA Personnel

In a memorandum dated January 3, 1984, R. S. Leddick, LP&L Vice President for Nuclear Operations, directed that the LP&L Quality Assurance (QA) personnel conduct interviews of the on-site contractor QA personnel to elicit any concerns the contractor staff may have regarding the quality of construction of Waterford-Unit 3. That memorandum also indicated that exit interviews would be similarly conducted with the contractor personnel prior to their leaving the Waterford 3 project. A total of 407 such interviews were conducted beginning in January 1984. Individual responses were sent to the specific employee(s) who raised the concern.

Exit interviews with the contractor QA employees (resigned, transferred, or terminated) began on January 16, 1984. A compilation of the concerns raised during those interviews were forwarded for followup on May 22, 1984.

The NRC staff reviewed all of the questionnaire forms and responses to the questions identified by the LP&L QA staff. In some cases, the NRC review identified additional potential issues, beyond those identified by LP&L, and responses that did not address the intent of the concerns. Nevertheless, the staff found that the majority of the concerns raised are being or have been addressed as part of all of the other NRC review efforts associated with Waterford 3.

As a result of the staff review, it is not evident that the survey and exit interviews have been vigorously pursued by LP&L to investigate the issues raised for safety significance, root cause, and generic implications. For example, the exit interviews began in January and are continuing. However, the process of reviewing the content of those interviews did not begin until late May 1984. For some of the interviews, additional information should have been obtained from the person interviewed but the interviewers did not indicate on the form whether or not they sought additional facts. Finally for a number of areas, issues or potential problems were acknowledged but it is not clear that any followup action occurred.

The NRC staff is concerned that the LP&L program to investigate issues does not promptly and thoroughly examine the specific areas and the programmatic implications of them. Other successful programs have utilized independently staffed groups to assess each issue raised and formally report to senior utility management on their findings and recommended corrective actions. These elements are not evident in the LP&L process. As a result, LP&L should develop and implement a formal program for handling issues raised by individuals. One of the first tasks to be dealt with by the program should be the review of the responses previously provided to the QA survey and during the exit interviews.

17. QC Verification of Expansion Anchor Characteristics

A review of Mercury Construction Procedure SP-666, Revision 8, "Drilled-In Expansion Type Anchors in Concrete for Category I Structures," revealed that it does not require QC verification of many characteristics necessary to ensure proper installation of concrete expansion anchors. These characteristics include:

- Spacing between adjacent anchors
- Spacing between an anchor and the edge of a concrete surface
- Spacing between an anchor and an embedded plate
- Minimum anchor embedment depth
- Grouting of unused/abandoned holes in the concrete
- Mounting plate size
- Size of holes in mounting plates and hole distance from plate edges

Although most of the above characteristics are addressed in Section 6.1 "installation," they are not included within Section 6.2 "Inspection," as items requiring QC verification. In addition, QC Inspection Report Form 277A, Rev. May 1982, "Equipment Installation (Anchors)," does not list these attributes as inspection points.

Therefore, Procedure SP-666 should be revised to include all necessary inspection attributes, and a reinspection program should be initiated. This program should be of sufficient size and scope to indicate whether these concrete anchors, in general, are able to perform their intended function. Detailed results should be made available to the NRC staff for review.

18. Documentation of Walkdowns of Non-Safety Related Equipment

A review of the design and evaluation of the non-safety instrument air piping, tubing, and their supports indicated that the general recommendations of Regulatory Guide 1.29, "Seismic Design Classification" were considered. This non-safety equipment is installed in areas with safety related equipment, such as the containment and auxiliary building areas. From the information provided relative to this system, it is apparent that the potential for system failure was considered in the design.

Also a number of procedures and controls were implemented to further assure that these non-safety related components would not affect safety related equipment. However, the followup documentation of the final walkdowns did not list the reviewed equipment in detail and therefore it could not be concluded that the instrument air piping and tubing (and their supports) had been adequately addressed regarding potential physical damage to safety-related equipment.

Therefore, documentation should be provided that clearly shows what equipment was reviewed during the walkdowns and on what bases it was concluded that the installation was acceptable.

19. Water in Basemat Instrumentation Conduit

In examining the safety significance of the allegations, the NRC staff performed system walkdowns as a means of verifying the as-built conditions. During one of those walkdowns, the staff noted that there was water in an electrical conduit that penetrated the basemat. If the seals in that conduit should fail there is a potential direct path for ground water to flood the auxiliary building basement. LP&L should review all conduit that penetrates the basemat and terminates above the top of the basemat to assure that these potential direct access paths of water are properly sealed.

20. Construction Materials Testing (CMT) Personnel Qualification Records

The Inquiry Team effort included a review of the disposition of the generic problem identified during the LP&L Task Force verification relative to GEO Construction Testing (GEO) documentation for personnel qualifications in the area of CMT.

The utility should conduct a review of supporting documentation for GEO corrective action stated in Attachment 6 of NCR W3-F7-116 (Ebasco W3-6487). This review should focus on the identification of CMT personnel placed in GEO Categories 1, 2 or 3 who were apparently qualified solely on written statements by other individuals attesting to the individuals training and qualifications. For such individuals, the applicant should pursue any new information or evaluations which could provide further assurance in support of the actual past work experience and training referenced by the written statements.

21. LP&L QA Construction System Status and Transfer Reviews

The Inquiry Team assessment of the Ebasco QA disposition of LP&L QA Construction documentation and walk-through hardware findings for a sample of the sixty-seven systems transferred to LP&L operations resulted in NRC questions on the adequacy of Ebasco and LP&L QA Construction disposition of those findings. As a result of the NRC questions LP&L and Ebasco QA initiated a review to ensure that all LP&L QA Construction findings were adequately dispositioned. Ebasco QA had identified 15 systems or subsystems (Nos. 18-3, 36-1, 36-3, 43B, 43B9, 46C, 46E, 46H, 55A, 59, 69B, 71B2, 72A, and 91E) where the LP&L findings may not have been properly dispositioned during the transfer of these systems to LP&L operations.

Based on the above, LP&L is requested to complete the review of all significant LP&L status and transfer review findings, such as undersized welds and other hardware walk-through and documentation findings. This review should ensure that these findings have been properly closed out or identified to LP&L operations for their closeout. For any LP&L open findings not properly identified on the status or transfer letters to LP&L operations, LP&L should determine whether this condition adversely affected the testing conducted for those systems.

22. Welder Qualifications (Mercury) and Filler Material Control (Site Wide) ---

The staff reviewed inprocess weld records for the installation of instrumentation systems by Mercury Company. Systems reviewed included Reactor Coolant, Safety Injection, Component Cooling Water, Main Steam, Main Feed, and Charging Water. The staff selected welders from these records and reviewed their qualifications to the welding process used during the time frame of actual welding.

Based on the staff's review it appears that some Mercury welders were not qualified. Problems included: welders not qualified to the correct welding procedure; welders qualified for a specific process, even though they were not tested for that process; and actual dates on qualification records appeared questionable, the welder may have welded prior to being tested. The staff concludes that there are questions relative to the Mercury welder qualification status.

Also during this review the staff evaluated the controls being used to control filler material. The staff found that the requirements for "rebaking" of low hydrogen electrodes did not meet the requirement of the ASME and AWS Codes. The Codes require low hydrogen electrodes to be rebaked at temperatures of 450° to 800°F for two hours. The site practice for all site contractors was to rebake at 200°F for eight hours. Justification for this Code deviation has not been provided by LP&L .

LP&L shall (1) Attempt to locate the missing documentation and determine if the welders were properly qualified, or (2) If the documentation to support proper qualification cannot be located, LP&L shall propose a program to assure the quality of all welds performed by questionably qualified welders.

LP&L shall also provide engineering justification for the allowance of "rebake" temperatures and holding times that differ from the requirements of the ASME and AWS Codes.

23. QA Program Breakdown Between Ebasco and Mercury

The staff review included evaluation of the implementation of the QA programs of LP&L, Ebasco, and Mercury. The staff performed a followup on the previous 1982 NRC review that resulted in NRC enforcement action and a civil penalty. The most recent staff review indicated that LP&L, Ebasco, and Mercury did not followup on the corrective action commitments made to the NRC.

Additionally LP&L, Ebasco, and Mercury failed to audit the entire QA program as required (LP&L only performed one-third of their scheduled audits for a five year period). The audits that were conducted identified some problems, however the required corrective actions were not completed. Management audits, performed by outside consultants, identified problems and concerns that LP&L also failed to take corrective action on.

The results of the NRC task force effort indicate that an overall breakdown of the QA program occurred. Most problems identified by the NRC had been previously identified by the QA programs of LP&L, Ebasco, and Mercury. But the failure to determine root cause and the lack of corrective action allowed the problem to persist.

LP&L shall provide an assessment of the overall QA program and determine the cause of the breakdown, together with corrective action to prevent recurrence. This overall assessment is necessary to provide assurance that the QA program can function adequately when the plant proceeds into operations.