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MIDDLE SOUTH UTILITIES SYSTEM

J.M. CAIN
President

October 31, 1984

50-382

W3B84-0807

Director of Nuclear Reactor Regulation
ATTN: Mr. Darrell G. Eisenhut, Director
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

SUBJECT: Waterford 3 SES
Partial Response to Items
from Waterford Review Team

REFERENCES: 1) Letter, D.G. Eisenhut to J.M. Cain, "Waterford 3 Review," dated June 13, 1984

2) Letter W3P84-3086, J.M. Cain to D.G. Eisenhut, "Request for Operating License," dated October 31, 1984

Dear Mr. Eisenhut:

The purpose of this letter is to submit LP&L responses to Issues 1, 6, 10 and 20 as set forth in your June 13, 1984 letter (Reference 1). These responses follow the approaches set forth in the revised Program Plans enclosed with this letter. Also enclosed is a supplement to the response to Issue 13. The supplement covers unprocessed Mercury NCRs and is provided in accordance with our commitment in the inital response to Issue 13. In addition we are submitting our assessment of the Collective Significance of the twenty-three issues.

Additional information on these issues will be provided, as indicated in the responses to these issues. We expect to submit the additional information by November 21, 1984. The responses as presently submitted include sufficient information to support safety analyses presented as part of the licensing program plan (Reference 2).

The submittals have been reviewed and verified by LP&L QA in accordance with procedure QASP 19-13. The designated subcommittee of the Waterford Safety Review Committee also has reviewed the adequacy of the responses for resolving the issues raised. The subcommittee scope of responsibility does not include independent validation of the facts.

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The Task Force has indicated by separate correspondence (enclosed) that it is satisfied with the logic of the submittals. However, it has not yet completed its independent validation of the facts. The Task Force has committed to notifying me and the NRC immediately should it find significant deviations in the course of its validation. In the event of such notification, LP&L will amend individual responses as may be necessary.

We request that you commence actions you deem necessary to lead to the resolution of these individual issues.

Sincerely,

James M. Cain

J.M. Cain

JMC:DA:pbs

Attachments

cc: Mr. R Leddick

Mr. D.E. Dobson

Mr. R.F. Burski

Mr. K.W. Cook

Mr. T.F. Gerrets

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Mr. L. Constable
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NUS-W3-A745
October 31, 1984

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

Reference: 1. Letter from D. G. Eisenhut, Director, Division of Licensing, USNRC to J. M. Cain, President and Chief Executive Officer, LP&L, Waterford 3 Review, June 13, 1984

2. Letter from D. M. Crutchfield, Assistant Director for Safety Assessment, Division of Licensing, USNRC to J. M. Cain, President and Chief Executive Officer, LP&L, Missing or Voided Mercury Company NCR's, September 19, 1984

Dear Mr. Cain:

We understand that you plan to submit LP&L responses to the NRC covering Issues 1, 6, 10 and 20 identified in reference 1. We also understand that you plan to submit a supplement to Issue 13 which addresses the NRC request in reference 2, for additional information on missing or voided Mercury Company NCR's. In addition we understand you are submitting your assessment of the Collective Significance of the twenty-three issues identified in references 1 and 2.

The Task Force has no objection to this course of action. We have studied these issues and find the logic stated in the LP&L responses to be adequate. You should note that the Task Force has not yet completed its independent validation of the facts presented in the responses. We will notify you and the NRC immediately if we find significant deviations in the course of our continuing validation effort. Of course, as you know, our work on all 23 issues and their collective significance is continuing. As of this date we have submitted formal reports on eight of the issues.

Sincerely,

Robert L. Ferguson by L. L. Humphreys

Robert L. Ferguson
Chairman
UNC Nuclear Industries

L. L. Humphreys

Larry L. Humphreys
President
UNC Operations Division

LLH/cn
cc

ISSUE: 1 DATE: 10/31/84

TITLE:

Inspection Personnel Issues

DESCRIPTION OF ISSUE:

Verify the proper certification of site QA/QC personnel or requalify the work performed by these personnel.

LP&L APPROACH TO RESOLUTION:

A verification program has been established to review the professional credentials of 100% of the site QA/QC personnel, including supervisors and managers who performed safety related functions at Waterford III during its construction. The discussions that follows applies to all contractors except J.A. Jones, Fegles, and GEO (CMT), which are addressed in Issues 10 and 20. Criteria for certification or qualification of QA/QC personnel will be based on ANSI N45.2.6-1973 and SNT-TC-1A for QC inspection personnel and contractor QA program requirements for QA personnel. Priority has been placed on dispositioning of potential deficiencies for contractors required to support safety evaluations on systems required for fuel load.

In addition, background investigations will be performed for personnel in all groups. If certification of an individual can not be verified appropriate site nonconformance documentation will be initiated to document evaluation of safety significance and corrective actions, including reinspections of work performed as necessary.

For Ebasco, LP&L and other site construction related QA/QC personnel remaining on site, a reverification of proper qualification is being accomplished in accordance with ANSI-N45.2.6-1973. LP&L operations Quality Control personnel will be reverified in accordance with ANSI N-45.2.6-1978 as committed to in FSAR section 17.2. Quality Control functions currently being undertaken as part of the inspections in progress are being performed by personnel reverified as qualified under ANSI-N45.2.6-1973.

WORK INSTRUCTIONS AND PROCEDURES EMPLOYED:

COMPANY	PROCEDURE NUMBER	TITLE
Ebasco	QAI No. 32	Instructions for Verifications of QA/QC Personnel Qualifications
LP&L	QASP 19.12	Review of Contractor QA/QC Personnel Qualification Verification
	QASP 19.13	Response Validation

ORGANIZATIONS INVOLVED:

ORGANIZATION	FUNCTIONS PERFORMED	PERSONNEL QUALIFICATION/TRAINING REQUIREMENTS
Ebasco	1. Verification Education/Experience of QA/QC personnel (except LP&L and Ebasco).	1. Training Requirements to QAI-32.
	2. a. Review program requirements of all contractors, review and collect data (except LP&L and Ebasco) and identify inspectors whose qualifications are not verifiable against ANSI N45.2.6-1973, SNT-TC-1A and QA Program requirements for QA personnel.	2. Ebasco's Quality Resources Training Manual-1 (QRTM-1) delineates the requirements for qualifying records reviewer. QAI-14, "Training and Qualification Requirements for Quality Assurance Records Personnel" endorses QRTM-1 and requires all reviewers have training on procedures they are reviewing to. For qualification/certification files, training requirements are QAI-32 and ANSI N45.2.6.
	b. Determine, to the extent feasible, inspections performed by personnel whose qualifications are not verifiable.	
	c. Disposition quality documentation generated by LP&L in item 5 below.	
LP&L	1. Audit Ebasco's implementation of QAI-32.	1. a. Indoctrination/training to LP&L and Ebasco procedures, ANSI N45.2.6-1973 and 1978, ANSI N45.2.23-78, SNT-TC-1A-75, and interpretations.
		b. Orientation as to task objective, organizations, and associated responsibilities and duties.
		c. OJT for three days to assure knowledge, understanding, and proficiency demonstration.

ORGANIZATIONS INVOLVED: CONT'D

ORGANIZATION	FUNCTIONS PERFORMED	PERSONNEL QUALIFICATION/TRAINING REQUIREMENTS
LP&L (Continued)		d. Individuals selected have inspection related experience and/or were involved in the training/certification or review of inspection personnel. e. Personnel involved in this process have not worked for Ebasco or any of the contractors under review.
	2. Review all LP&L and Ebasco as well as those verified by Ebasco.	2. Same as item (1).
	3. Sample Education/Experience verification of contractors performed by Ebasco.	3. Same as items (1).
	4. Perform final management determination of the qualifications of individuals who are potentially unqualified.	4. Review Board-Three senior LP&L QA personnel qualified to ANSI N45.2.23 (1978).
	5. Initiate suitable quality documentation in cases where inspections were performed by personnel where qualification could not be verified.	5. LP&L lead auditor who is qualified to ANSI N45.2.23 (1978).
	6. Make final determination on dispositioning of quality documentation mentioned in 4. above by Ebasco.	6. LP&L QA and Project Management
	7. Validate response per QASP 19.13 to assure positive statements of fact are substantiated.	7. Validation will be performed under the direct supervision of the LP&L lead auditor who is qualified to ANSI N45.2.23 (1978).

ORGANIZATIONS INVOLVED: CONT'D

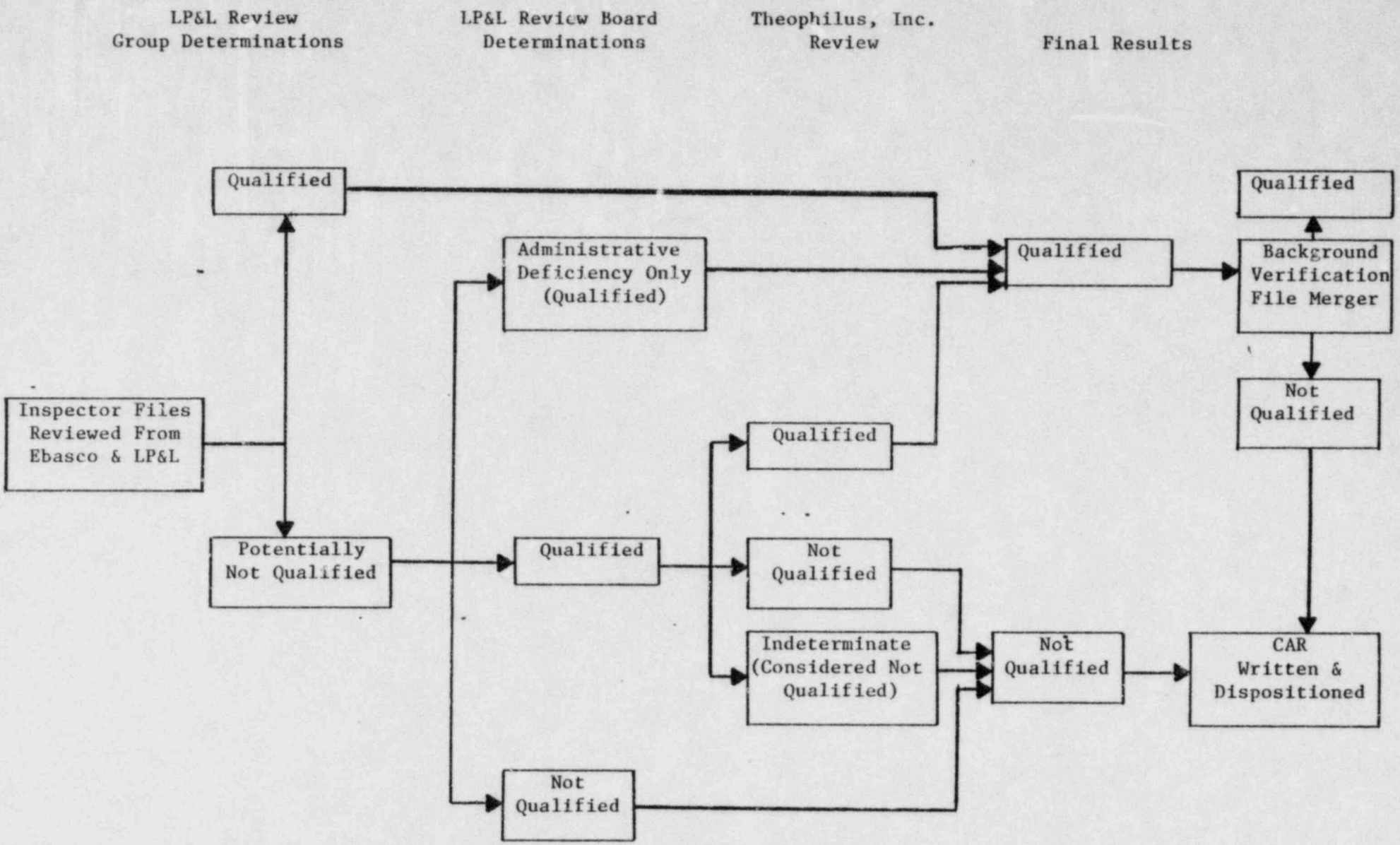
ORGANIZATION	FUNCTIONS PERFORMED	PERSONNEL QUALIFICATION/TRAINING REQUIREMENTS
Theophilus, Inc.	1. The purpose of the Theophilus, Inc. assessment was to provide a totally independent evaluation of the qualification of inspectors determined to be potentially not qualified by the LP&L Review Group and potentially qualified by the LP&L Review Board.	1. Previous experience with regard to performing regulatory inspections in the area of inspection and testing personnel. Previous qualification to ANSI N45.2.23-1978.

ATTACHMENTS:

1. Flow Chart - Inspector Qualification Review

ATTACHMENT 1

FLOW CHART-INSPECTOR QUALIFICATION REVIEW



ISSUE: 6 DATE: 10/31/84

TITLE:

Dispositioning of Non-conformance and Discrepancy Reports

DESCRIPTION OF ISSUE:

Some Ebasco and Mercury NCRs and Ebasco DRs were questionably dispositioned and LP&L shall propose a program to assure all NCRs and DRs are appropriately upgraded, adequately dispositioned and corrective action completed and that any problems detected are corrected.

LP&L APPROACH TO RESOLUTION:

First, the specific Ebasco and Mercury NCRs and Ebasco DRs cited by the NRC will be evaluated for proper disposition, implementation of corrective action, appropriate documentation, and proper closure. To date, though some minor deficiencies have been identified, no physical rework has been required.

Second, a program review of Ebasco NCRs closed prior to February, 1984 was started by LP&L in February, 1984 to assess the validity of the disposition, the review for reportability per 10CFR50.55(e) or 10CFR21, and proper closure. Approximately 115 of the more than 7100 NCRs reviewed have been identified as having deficiencies in the above attributes. These are being evaluated. The deficiencies that have thus far been evaluated have no safety significance.

Third, an indepth verification has been conducted by LP&L on a random sample of 124 of the above noted potentially deficient Ebasco NCRs to assure that the hardware and/or software corrective action had been completed. This included an evaluation of documentation for the required corrective action. Approximately forty-five NCRs were identified as having minor deficiencies. The deficiencies that have thus far been evaluated have no safety significance.

Fourth, an additional set of approximately 530 Ebasco NCRs closed since February, 1984 have been reviewed by LP&L for proper disposition, adequate documentation to support the required corrective action, required software changes completed and proper closure. To date, one deficiency has been identified that involves physical rework. This deficiency has been evaluated and has no safety significance.

Fifth, a review of Mercury NCR's will be performed as follows: a) A sample of NCRs that were dispositioned rework/repair or reject for reportability per 10CFR50.55(e), b) NCR dispositioned Use-As-Is to assure they were upgraded to Ebasco NCRs, c) a random sample of sixty-five (65) NCRs that were dispositioned rework/repair for proper disposition, adequate documentation of corrective actions required, and proper closure.

Finally, a random sample of 230 Mercury and 230 T-B DRs have been reviewed to verify proper closure.

WORK INSTRUCTIONS AND PROCEDURES EMPLOYED:

COMPANY	PROCEDURE NUMBER	TITLE
Ebasco	QAI-33	Instruction for Reporting Deficiency Report Sheets
LP&L	QASP 19.13 WI-L-6.1	Response Validation Nonconformance Report Review

ORGANIZATIONS INVOLVED:

ORGANIZATION	FUNCTIONS PERFORMED	PERSONNEL QUALIFICATION/TRAINING REQUIREMENTS
Ebasco	1) Review of NCRs cited in concern	1) The review was performed by QA Engineers under the supervision of the Lead QA Engineer.
	2) Review of DRs cited in Concern	2) The review was performed by Engineers under the supervision of the QAIRG QA Engineer.
	3) Review random sample of Mercury and T-B DRs.	3) Same as item 2.
	4) Review random sample of Mercury NCRs.	4) The review was performed by QA Document Reviewers under the supervision of the EC-QA Manager.
LP&L	1) LP&L QA engineers performed a review of Ebasco dispositioned NCR's in accordance with Work Instruction "Non-Conformance Report Review". This review included: 1) Performing and documenting special reviews of specified NCR's. 2) Documenting and processing potential deficiencies through resolution and closure, and 3) Field verification of selected NCR's.	1) Review conducted by the LP&L lead auditor who is qualified to ANSI N45.2.23-1978.

ORGANIZATIONS INVOLVED: (Continued)

ORGANIZATION	FUNCTIONS PERFORMED	PERSONNEL QUALIFICATION/TRAINING REQUIREMENTS
	2) Validation per QASP 19.13 will consist of but not limited to the following: Validate that Ebasco reviewed the nonconforming conditions and provided justification where necessary for the dispositioning of the NCR.	2) Validation was performed under the direct supervision of the LP&L lead auditor who is qualified to ANSI N45.2.23-1978.
	3) Verify that objective evidence exists to support statements of fact made in the response.	3) Same as Item 2.

ATTACHMENTS:

1) Process Flow Chart - Nonconformance Report Review

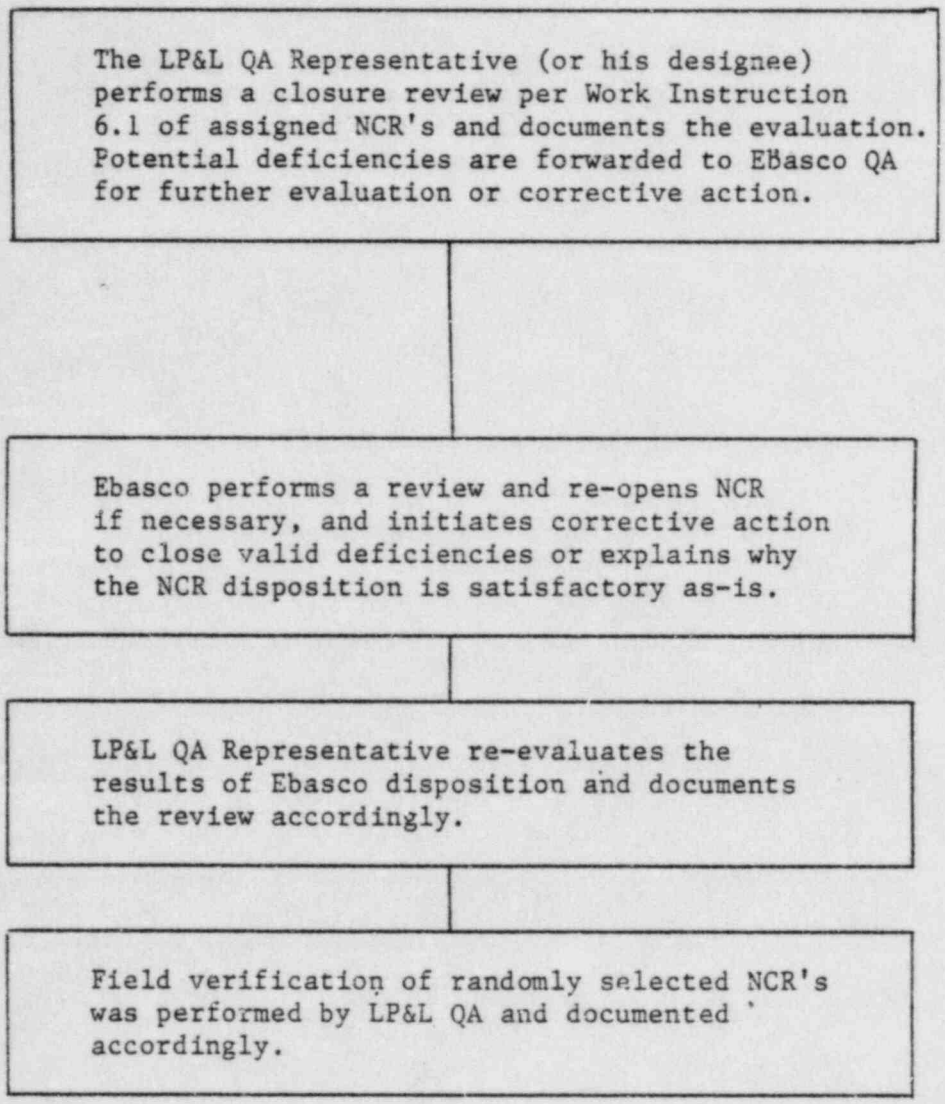
2) Process Flow Chart - Specific NCR Review

3) Process Flow Chart - Mercury NCR Review

4) Process Flow Chart - Review of DRS

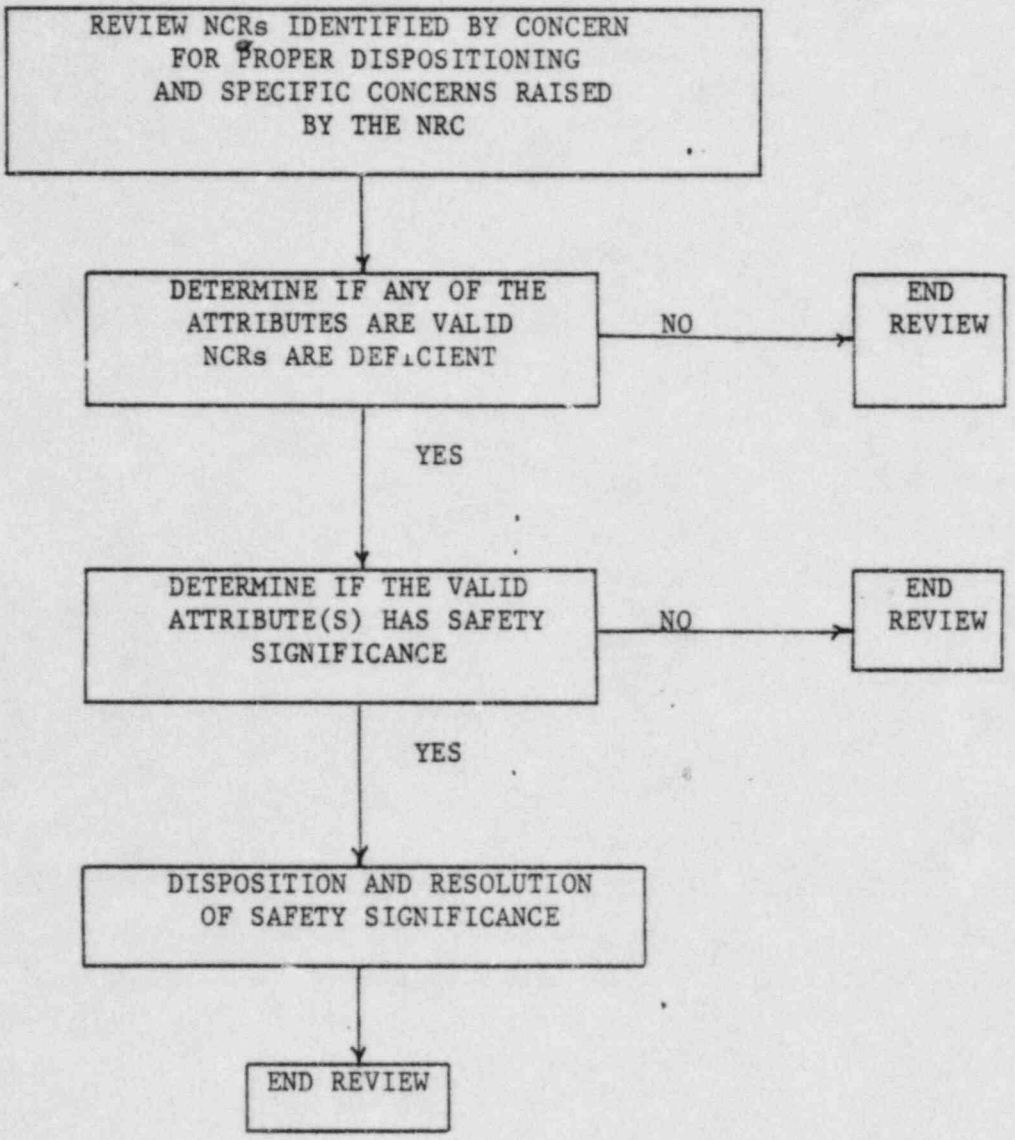
ATTACHMENT 1

PROCESS FLOW CHART
LP&L NON-CONFORMANCE REPORT REVIEW



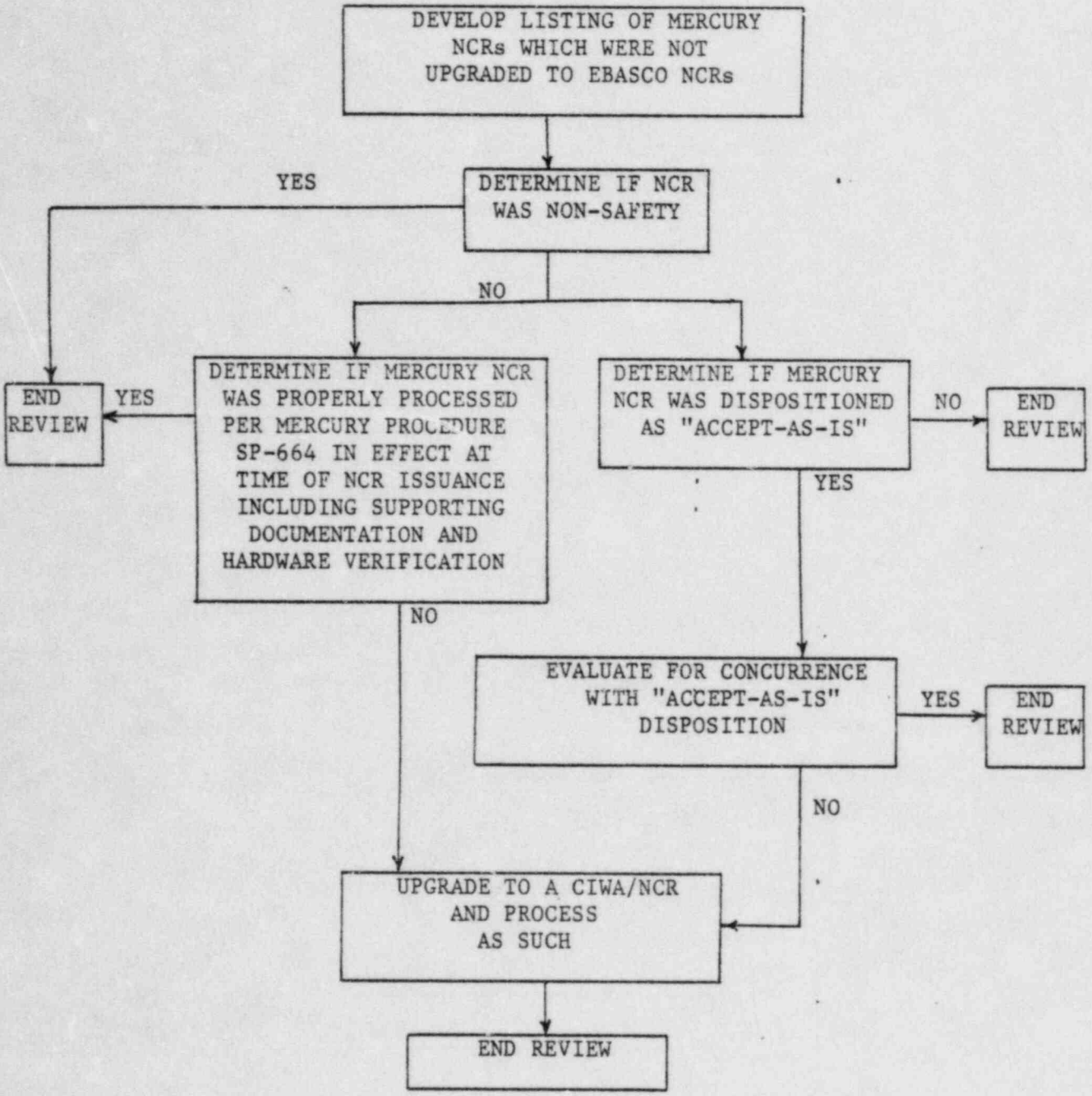
ATTACHMENT 2

PROCESS FLOW CHART-
SPECIFIC NCR REVIEW



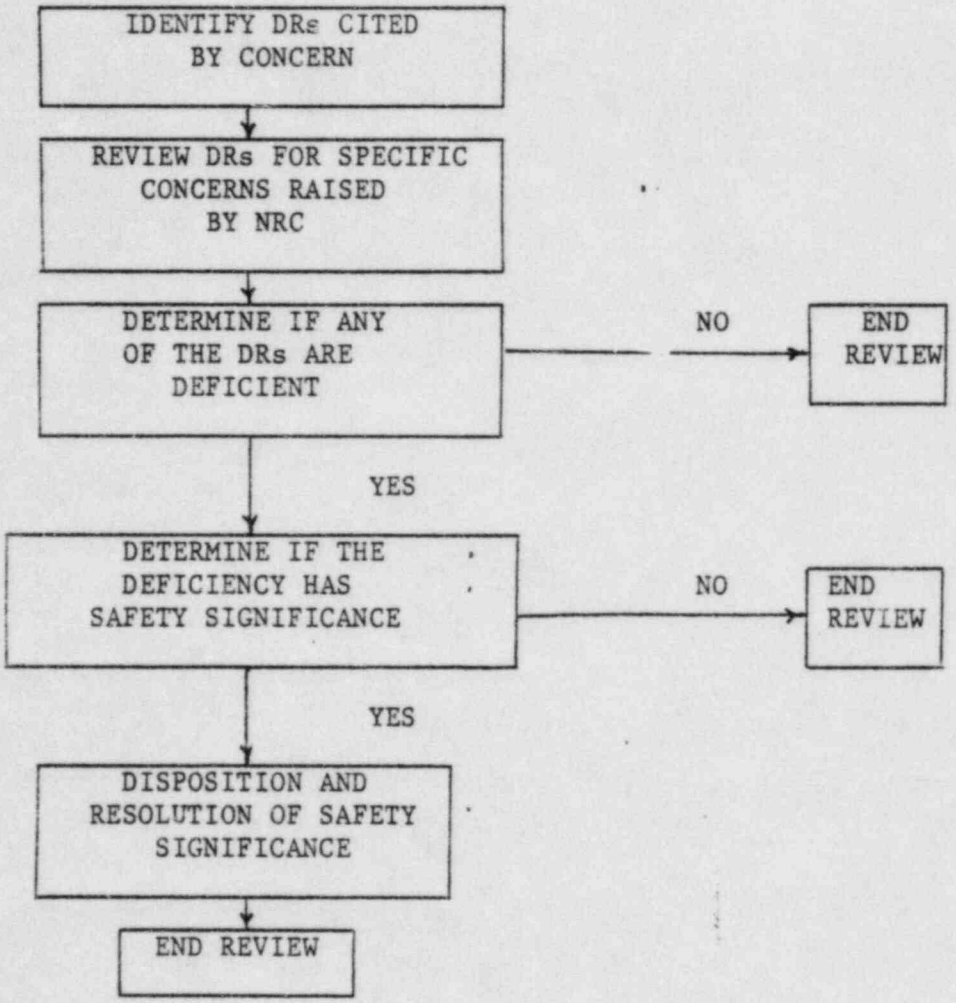
ATTACHMENT 3

PROCESS FLOW CHART-
MERCURY NCR REVIEW



ATTACHMENT 4

PROCESS FLOW CHART-
REVIEW OF DRs



ISSUE: 10 DATE: 10/31/84

TITLE:

Inspector Qualification (J.A. Jones and Fegles)

DESCRIPTION OF ISSUE:

Verify the proper certification of QA/QC personnel and evaluate the impact of any deficiencies found.

LP&L APPROACH TO RESOLUTION:

A verification program has been established to review the professional credentials of 100% of the site QA/QC personnel for J.A. Jones and Fegles, including supervisors and managers who performed safety related functions at Waterford III during its construction. Criteria for certification or qualification of QA/QC personnel will be based on ANSI N45.2.6-1973 and SNT-TC-1A for QC inspection personnel and construction QA program requirements for QA personnel.

In addition, background investigations have been performed for all QA/QC personnel. If qualification on an individual cannot be verified, appropriate site nonconformance documentation will be initiated to document evaluation of safety significance and corrective actions, including reinspection of work performed as necessary.

WORK INSTRUCTIONS AND PROCEDURES EMPLOYED:

COMPANY	PROCEDURE NUMBER	TITLE
Ebasco	QAI No. 32	Instructions for Verifications of QA/QC Personnel Qualifications.
LP&L	QASP 19.12	Review of Contractor QA/QC Personnel Qualification Verification.
	QASP 19.13	Response Validation

ORGANIZATIONS INVOLVED:

ORGANIZATION	FUNCTIONS PERFORMED	PERSONNEL QUALIFICATION/TRAINING REQUIREMENTS
Ebasco	(1) Verify Education/Experience of QA/QC personnel.	(1) Training Requirements to QAI-32.
	(2) a. Review program requirements of J.A. Jones and Fegles, and identify inspectors whose qualifications are not verifiable against ANSI N45.2.6-1973, SNT-TC-1A and QA program requirements for QA personnel.	(2) Ebasco's Quality Resources Training Manual-1 (QRTM-1) delineates the requirements for qualifying records reviewer. QAI-14, "Training and Qualification Requirements for Quality Assurance Records Personnel" endorses QRTM-1 and requires all reviewers have training on procedures they are reviewing to. For qualification/certification files training requirements are QAI-32 and ANSI N45.2.6.
	b. Determine, to the extent feasible, inspections performed by personnel whose qualifications are not verifiable.	
	c. Disposition Quality Documentation generated by LP&L in item (5) below.	
LP&L	(1) Audit Ebasco's implementation on QAI-32.	(1) (a) Indoctrination/training to LP&L and Ebasco procedures, ANSI N45.2.6-1973 and 1978, ANSI N45.2.23-78, SNT-TC-1A-75 and interpretations.
		(b) Orientation as to task objectives, organizations, and associated responsibilities and duties.
		(c) OJT for three days to assure knowledge, understanding, and proficiency demonstration.
		(d) Individuals selected have inspection related and/or were involved in the training/certification or review.

ORGANIZATIONS INVOLVED: (Continued)

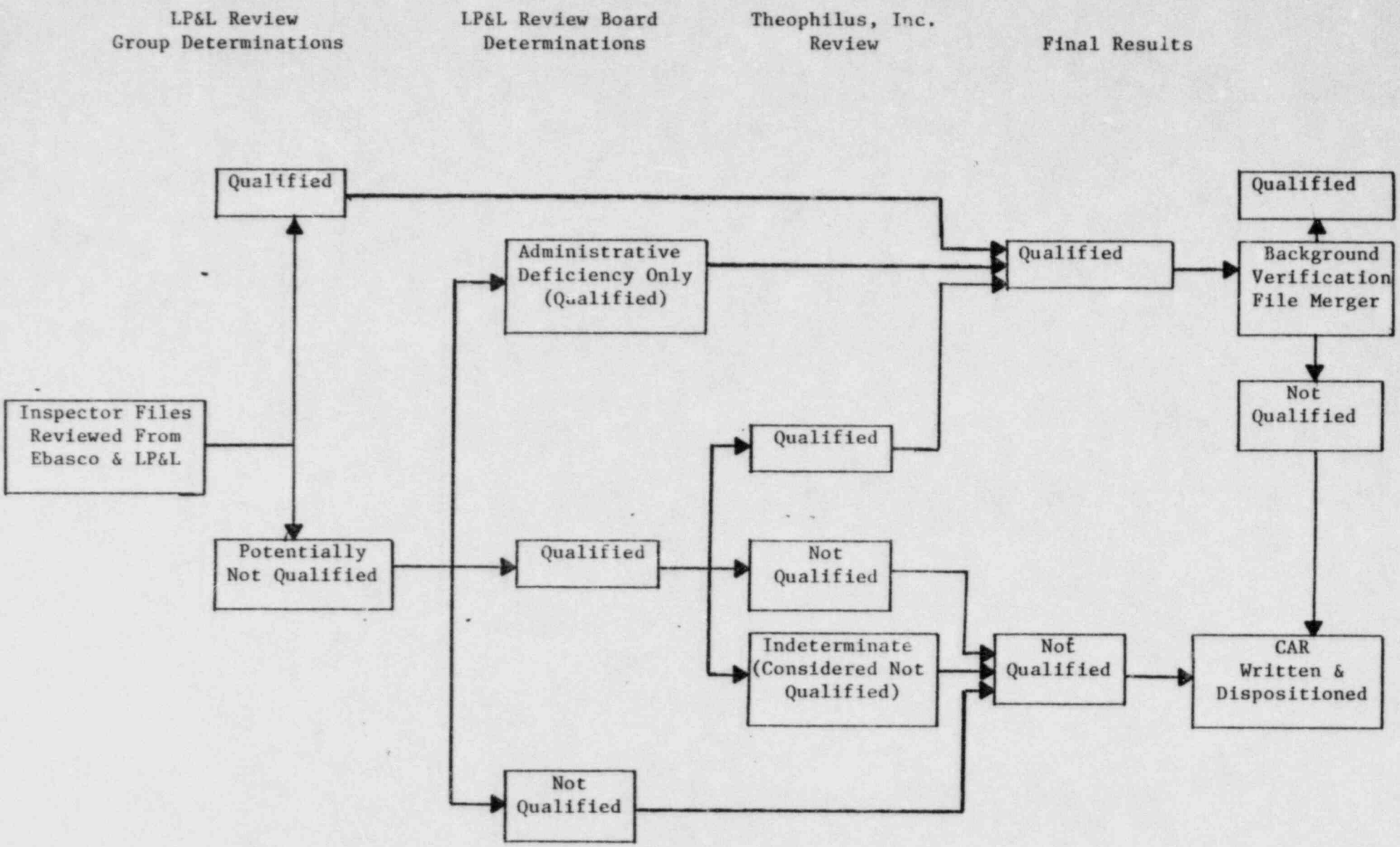
ORGANIZATION	FUNCTIONS PERFORMED	PERSONNEL QUALIFICATION/TRAINING REQUIREMENTS
		(1) (e) Personnel involved in this process have not worked for Ebasco, J.A. Jones, or Fegles.
	(2) Review all those verified by Ebasco.	(2) See Item 1 above.
	(3) Sample Education/Experience verification of J.A. Jones and Fegles performed by Ebasco.	(3) See Item 1 above.
	(4) Perform final management determination of the qualifications of individuals who are potentially unqualified.	(4) Review Board - Three Senior LP&L QA personnel qualified to ANSI N45.2.23 (1978).
	(5) Initiate suitable quality documentation in cases where inspections were performed by personnel where qualifications could not be verified.	(5) LP&L lead auditor who is qualified to ANSI N45.2.23 (1978).
	(6) Make final determination on dispositioning of quality documentation mentioned in (4) above by Ebasco.	(6) LP&L QA and Project Management.
	(7) Validate response per QASP 19.13 to assure positive statements of fact are substantiated.	(7) Validation will be performed under the direct supervision of the LP&L lead auditor who is qualified to ANSI N45.2.23 (1978).
Theophilus, Inc.	(1) The purpose of the Theophilus, Inc. assessment was to provide a totally independent evaluation of the qualification of inspectors determined to be potentially not qualified by the LP&L Review Group and potentially qualified by the LP&L Review Board.	(1) Previous experience with regard to performing regulatory inspections in the area of inspection and testing personnel. Previous qualification to ANSI N45.2.23-1978.

ATTACHMENTS:

1. Flow Chart - Inspector Qualification Review

ATTACHMENT 1

FLOW CHART-INSPECTOR QUALIFICATION REVIEW



ISSUE: 20 DATE: 10/31/84

TITLE:

Construction Materials Testing (CMT) Personnel Qualification Records.

DESCRIPTION OF ISSUE:

Verify the proper certification of construction materials testing personnel.

LP&L APPROACH TO RESOLUTION:

GEO has been contacted to assist in providing additional background information or justification for qualification of QA/QC personnel identified as part of NCR W3-F7-116.

A verification program has been established to review the professional credentials of 100% of the GEO CMT site QA/QC personnel, including supervisors and managers who performed safety related functions at Waterford III during its construction. Criteria for certifications or qualification of QA/QC personnel will be based on ANSI N45.2.6-1973 and SNT-TC-1A for QC inspection personnel and construction QA program requirements for QA personnel.

In addition background investigations will be performed for personnel in all groups. If qualification of an individual can not be verified, appropriate site nonconformance documentation will be initiated to document evaluation of safety significance and corrective actions, including reinspection of work performed as necessary.

For GEO QC Inspectors remaining on site, a reverification is being completed of proper qualification in accordance with ANSI-N45.2.6-1973.

WORK INSTRUCTIONS AND PROCEDURES EMPLOYED:

COMPANY	PROCEDURE NUMBER	TITLE
Ebasco	QAI No. 32	Instructions for Verifications of QA/QC Personnel Qualifications.
LP&L	QASP 19.12	Review of Contractor QA/QC Personnel Qualification Verification.
	QASP 19.13	Response Validation

ORGANIZATIONS INVOLVED:

ORGANIZATION	FUNCTIONS PERFORMED	PERSONNEL QUALIFICATION/TRAINING REQUIREMENTS
Ebasco	1) Verify Education/Experience of QA/QC personnel.	1) Training requirements to QAI-32.
	2a) Review program requirements of GEO, review and collect data and identify inspectors whose qualifications are not verifiable against ANSI N45.2.6-1973. SNT-TC-1A and QA program requirements for QA personnel.	2) Ebasco's Quality Resources Training Manual-1 (QRTM-1) delineates the requirements for qualifying records reviewer. QAI-14, "Training and Qualification Requirements for Quality Assurance Records Personnel" endorses QRTM-1 and requires all reviewers have training on procedures they are reviewing to. For qualification/certification filed training requirements are QAI-32 and ANSI N45.2.6.
	b) Determine, to the extent feasible, inspections performed by personnel whose qualifications are not verifiable.	
	c) Disposition quality documentation generated by LP&L in item (5) below.	
LP&L	1) Audit Ebasco's implementation of QAI-32.	1) (a) Indoctrination/training to LP&L & Ebasco procedures, ANSI N45.2.6-1973 & 1978, ANSI N45.2.23-78 SNT-TC-1A-75 & interpretations.
		(b) Orientation as to task objectives, organizations, and associated responsibilities and duties.

ORGANIZATIONS INVOLVED: (CONT'D)

ORGANIZATION	FUNCTIONS PERFORMED	PERSONNEL QUALIFICATION/TRAINING REQUIREMENTS
LP&L	Cont'd	(c) OJT for three days to assure knowledge, understanding, and proficiency demonstration. (d) Individuals selected have inspection related and/or were involved in the training/certification or review of inspection personnel types. (e) Personnel involved in this process have not worked for Ebasco or GEO.
	2) Review all those verified by Ebasco.	2) See Item 1 above.
	3) Sample Education/Experience verification of GEO performed by Ebasco.	3) See Item 1 above.
	4) Perform final management determination of the qualifications of individuals who are potentially unqualified.	4) Review Board - Three Senior LP&L QA personnel qualified to ANSI N45.2.23 (1978).
	5) Initiate suitable quality documentation in cases where inspections were performed by personnel where qualifications could not be verified.	5) LP&L Lead Auditor who is qualified to ANSI N45.2.23 (1978).
	6) Make final determination on dispositioning of quality documentation mentioned in 4) above by Ebasco.	6) LP&L QA and Project Management.
	7) Validate response per QASP 19.13 to assure positive statements of fact are substantiated.	7) Validation will be performed under the direct supervision of the LP&L Lead Auditor who is qualified to ANSI N45.2.23 (1978).

ORGANIZATIONS INVOLVED: (CONT'D)

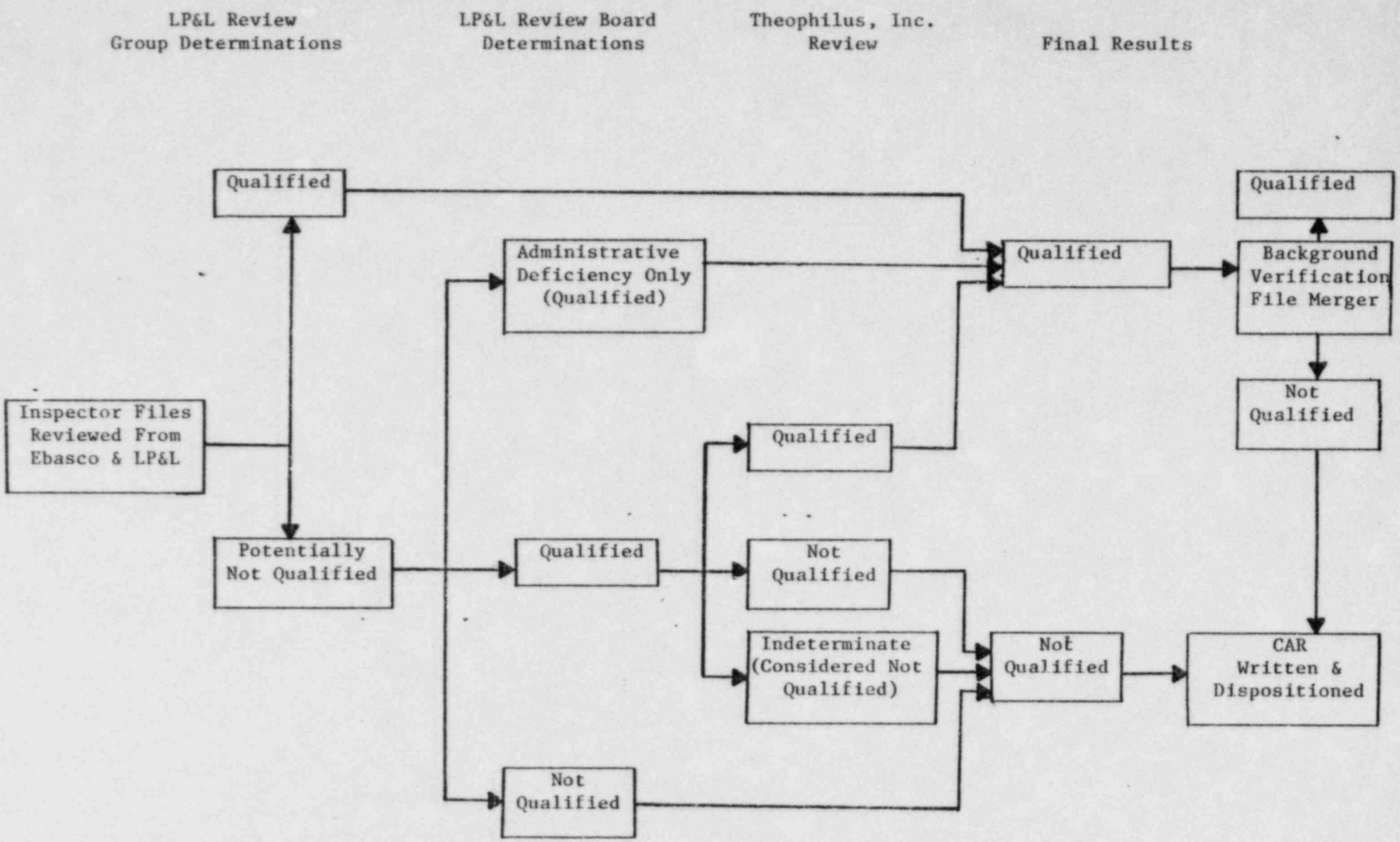
ORGANIZATION	FUNCTIONS PERFORMED	PERSONNEL QUALIFICATION/TRAINING REQUIREMENTS
Theophilus, Inc.	1. The purpose of the Theophilus, Inc. assessment was to provide a totally independent evaluation of the qualification of inspectors determined to be potentially not qualified by the LP&L Review Group and potentially qualified by the LP&L Review Board.	1. Previous experience with regard to performing regulatory inspections in the area of inspection and testing personnel. Previous qualification ANSI N45.2.23-1978.

ATTACHMENTS:

1. Flow Chart - Inspector Qualification Review

ATTACHMENT 1

FLOW CHART-INSPECTOR QUALIFICATION REVIEW



RESPONSE

ITEM NO: 1

TITLE: Inspection Personnel Issues

NRC DESCRIPTION OF CONCERN:

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 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 indeterminant. 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.

DISCUSSION:

A verification program was implemented to review the professional credentials of 100% of the site QA/QC personnel who may have performed safety-related functions at Waterford 3, concentrating on inspection personnel and including supervisors, managers and remaining QA/QC personnel.

This verification program included the QA/QC personnel of all site organizations which performed safety related functions. Personnel from the following organizations will be addressed in this response:

(1) LP&L
(2) Ebasco
(3) American Bridge,
(4) B&B Insulation
(5) Chicago Bridge & Iron
(6) Combustion Engineering
(7) Fischbach and Moore
(8) GEO (NDE)
(9) Gulf Engineering
(10) Mercury Company of Norwood
(11) Nisco
(12) Nooter
(13) Sline
(14) Tompkins-Beckwith
(15) Waldinger

The responses to Issues No. 10 and 20 discuss inspector qualifications for Fegles, GEO (CMT) and J.A. Jones QA/QC personnel.

The program, which is being performed under the overall direction of LP&L, consists of three major elements:

- Collection and verification of personnel data.
- Evaluation of qualifications against specified standards.
- Dispositioning of deficiencies resulting from cases where inspections and tests were conducted by personnel whose qualifications against the appropriate standards could not be confirmed.

Collection and Verification of Personnel Data

Most of the contractors which performed safety related work on Waterford 3 have demobilized. Personnel data was collected from various sources, including site files, contractor home office files, personal contact with individuals or supervisors and through a background verification program.

Personnel data for LP&L QA/QC personnel was compiled under the supervision of LP&L. Personnel data for Ebasco QA/QC personnel and that of the QA/QC personnel of other site contractors was compiled under the supervision of Ebasco.

Efforts were made to verify the education and work experience of 100% of the site QA/QC personnel by researching Waterford 3 contractor records and by contacting schools, former employers and others. The background verification effort for site subcontractor personnel was a joint LP&L/Ebasco effort. LP&L performed the verification of the backgrounds of its own employees and of Ebasco employees. Ebasco personnel were used to some extent in this effort under overall LP&L control. LP&L also audited and sampled the background verification performed by Ebasco. While the success rate of this effort was good, there were cases where confirmatory information was not obtainable. In such cases, the judgement of the LP&L Review Board, as described below, was used to rule on the reliability of the available information.

Evaluation of Qualifications to Specified Standards

QA/QC personnel data were evaluated in order to classify individuals as either having verified qualifications or not. Training, education and work experience were the qualifications of primary concern. These qualifications were verified against the following criteria:

(1) Inspectors - ANSI N45.2.6-1973

(2) NDE Personnel - ANST SNT-TC-1A 1968 or 1975, as appropriate.

(3) Other QA/QC Personnel - QA Program requirements

(4) Operational QC Personnel - Regulatory Guide 1.58 Rev. 1 (ANSI N45.2.6-1978)

Initial qualification determinations for Ebasco and LP&L QA/QC personnel were performed by an LP&L review group. Initial qualification determinations for QA/QC personnel of other contractors were performed first by Ebasco and then separately by the LP&L review group. In order to control the consistency of these determinations, approved procedures were utilized. Determinations related primarily to balancing education, experience and training factors.

The LP&L review group qualification determinations were rendered in two categories: "qualified" and "potentially not qualified". "Potentially not qualified" determinations were referred to an LP&L Review Board comprised of senior LP&L QA personnel. The Review Board determinations were further reviewed by a consultant very familiar with inspector qualification and related standards. This process resulted in a final determination for all QA/QC personnel as either "qualified" or "unqualified".

In addition to the redundant reviews indicated above, LP&L has specifically requested the NUS/UNC Pre-Licensing Issues Task Force to verify the qualifications to applicable standards of all LP&L QA/QC personnel and to sample Ebasco QA/QC personnel.

The qualification review process is described in QASP 19.12 and QAI-32. The following points further clarify the process:

1. The meaning of the term "unqualified" must be amplified. In some cases determinations were made that, based on verified data, individuals' backgrounds did not warrant qualification to ANSI N45.2.6-1973. In other cases, however, individuals were considered "unqualified" as an expedient in reaching resolution to the concern. This occurred in cases in which:

   a. Research of records, inquiries to past employees, contact with schools and verification of training received was either not possible or could not be concluded in a reasonable period of time.

   b. Apparent discrepancies existed between background information provided by some individuals and that obtained in the verification process, and resolution could not be achieved on a timely basis. Minor discrepancies were excused; however, significant discrepancies generally rendered any other significant but unverified data as suspect.

2. In the process used, being judged as "unqualified" to ANSI N45.2.6-1973 did not automatically render the individual's work as invalid. For example, an individual may not have the education and experience qualifications for all inspection work, yet be fully competent through specific training or other means to perform the particular tasks assigned to him, which might have been very simple and repetitive in nature. Such an individual potentially satisfies ANSI requirements, which ultimately require that an individual's qualifications be sufficient to provide reasonable assurance that the individual can competently perform a particular task. Whether or not the individual is technically qualified, the individuals' work can be deemed valid.

3. During the construction period, some contractors made undocumented judgements with respect to the need for eye examinations for inspection personnel. Such judgements were based on the level of visual acuity or color perception required to achieve competent inspections. Such judgements were also made as part of the verification program and disposition process and will be documented. It is noted that such judgements are specifically suggested in ANSI N45.2.6-1978. This factor was not deemed disqualifying.

4. Some individuals were classified as inspectors but performed no safety related inspections. To the extent such individuals were identified, they were excluded from the overall inspector population.

Disposition of Deficiencies

For each contractor which performed safety related work, the LP&L Review Board compiled a list of "unqualified" inspector personnel, and Corrective Action Requests (CAR) were written to formally track and disposition potential deficiencies. Disposition of such documents may require research into inspections performed by individuals, further research into an individual's background, reinspection, engineering evaluation, analysis of previous reinspections or proof tests (NDE, hydrostatic tests), statistical analyses or rework in order to assure acceptability of the plant components inspected by the personnel in question. Determination of the method of dispositioning is on a case by case basis.

For most contractors who performed safety related work, the disposition of deficiencies generally has not required a large degree of reinspection. In the case of Mercury, substantial reinspection was initiated, particularly the N1 instrumentation tubing installation. The N1 instrumentation has been found acceptable with no significant rework identified. In other isolated cases, reinspection was also deemed appropriate. To date, such reinspected installations have been found acceptable and no rework has been required.

Included in Attachment 1 are the verification program results for Mercury, Tompkins-Beckwith, NISCO, GEO (NDE), American Bridge, Chicago Bridge & Iron and Combustion Engineering QC inspectors and explanations of how resultant deficiencies were resolved. Limited background verification efforts remain for these contractors' personnel. Should completion of the verification cause a change in the results, the response will be amended accordingly. Supplements to this response for the remaining contractor personnel, including QA personnel for all contractors, will be provided as they are completed.

Remaining Site QA/QC Personnel

The qualifications of personnel currently performing QA/QC functions on site are being verified under the verification program.

CAUSE:

ANSI N45.2.6-1973 allows substitution for education and experience levels by noting that "... education and experience requirements specified for the various levels should not be treated as absolute when other factors provide reasonable assurance that a person can competently perform a particular task." Waterford 3 contractors, to varying degrees, employed such substitutions in certifying the qualifications of their QA/QC personnel. However, the verification program revealed that verification of background data was not adequate or documented, documentation of the justification for substitution was sometimes not provided or lacked depth, and/or was not always totally in accord with contractor procedures or the ANSI Standards, as currently interpreted.

GENERIC IMPLICATIONS:

This issue has been treated generically. The scope of the verification program included 100% of the QA/QC personnel of all site contractors who performed safety related work.

With regard to future work, qualification and certification of inspectors (including NDE personnel) will be administered through strict compliance with LP&L Nuclear Operations Procedures which meet the requirements of Regulatory Guide 1.58 Rev. 1 (ANSI N45.2.6-1978) and SNT-TC-1A-1975, as applicable.

SAFETY SIGNIFICANCE:

The results, to date, of the effort employed in responding to this issue further confirm the many other methods (including independent (ANI, etc.) inspection, nondestructive testing, prerequisite/preoperations/integrated testing, and special analyses) employed at Waterford 3 to gain adequate confidence that the Waterford 3 systems, structures, and components will perform satisfactorily in service.

Satisfactory disposition of corrective action documentation, generated as a result of the verification program, will provide adequate assurance that the installed structures, systems and components will perform satisfactorily in service.

CORRECTIVE ACTION PLAN/SCHEDULE:

Actions required to disposition corrective action documentation generated as a result of the verification program are in progress. To date, no items of safety significance have been identified. Priority attention has been given to completion and dispositioning of QC (inspector) issues, since actual inspections have a more direct bearing on the quality of the constructed plant. Non-inspector personnel qualification issues, and the inspectors for the remaining contractors, will be addressed in supplements to this response. It is currently anticipated that the dispositions of QA/QC personnel qualification issues will be completed by November 21, 1984.

ATTACHMENTS:

Verification Program Results and Disposition of Deficiencies, by Contractor.

REFERENCES:

1. QASP 19.12, Review of Contractor QA/QC Personnel Qualification Verification
2. QAI-32, Instructions for Verification of QA/QC Personnel Qualifications

ATTACHMENT 1

SITE ORGANIZATIONS WHICH PERFORMED SAFETY RELATED WORK *

INDEX

A. LP&L

B. Ebasco

C. American Bridge

D. B&B Insulation

E. Chicago Bridge & Iron

F. Combustion Engineering

G. Fischbach and Moore

H. GEO (NDE)

I. Gulf Engineering

J. Mercury Company of Norwood

K. Nisco

L. Nooter

M. Sline

N. Tompkins - Beckwith

O. Waldinger

* Fegles, GEO (CMT) and J.A. Jones are included in Items No. 10 and 20.

ATTACHMENT 1

A. LP&L

1. On-Site Dates: April 1975 to present

2. Scope of Work:

Owner

3. Scope of Inspection:

a. Construction Phase - Reinspection of selected construction activities.
b. Startup Phase - Inspection of designated startup activities.
c. Operations Phase - Inspection during:
    1) Maintenance
    2) Modifications
    3) Repair
    4) Material Receiving
    5) Storage Activities

4. QA Program Requirements:

a. INSPECTORS
    1) Construction Phase
        a) ANSI N45.2.6 - 1973
        b) QASP 2.12 "QA Section Qualification and Certification of Inspection Personnel"
    2) Startup Phase
        a) ANSI N45.2.6 - 1978(Regulatory Guide 1.58, Revision 1, September 1980)
    3) Operations Phase
        a) ANSI N45.2.6 - 1978(Regulatory Guide 1.58, Revision 1, September 1980)
        b) QI-010-001 "Inspector Qualification"

b. AUDITORS
    1) Construction Phase
        a) ANSI N45.2.23 - 1978(Used as guide only)
        b) QASP 2.3 "Qualification and Certification of Audit Personnel"
    2) Startup Phase
        a) ANSI N45.2.23 - 1978(Regulatory Guide 1.146-1980)
        b) QASP 2.3 "Qualification and Certification of Audit Personnel"
    3) Operations Phase
        a) ANSI N45.2.23 - 1978(Regulatory Guide 1.146-1980)
        b) QASP 2.3 "Qualification and Certification of Audit Personnel"

5. Inspector Qualification and Dispositioning of Deficiencies:

(In Progress)

ATTACHMENT 1

B. EBASCO

1. On-Site Dates: April 1972 to present.

2. Scope of Work:

   a. Architect/Engineer
   b. Construction Management
   c. Installation and Construction

3. Scope of Inspection:

   a. Receiving Inspection
   b. Surveillance of Contractor activities
   c. Inspection of Ebasco installation and construction (all disciplines)
   d. Independent QC inspection of construction activities through 1977.

4. QA Program Requirements/Contractual Commitments:

   a. QAE Personnel - Basic Site Orientation or QA and Safety Orientation
   b. Quality Management/Supervisors - Basic Site Orientation or QA and Safety Orientation.
   c. QA Auditors - Ebasco Procedure QA G.3, "Qualification of QA Audit Personnel". Qualification requirements are based on education, nuclear experience, related Engineering, or manufacturing experience and professional credentials.
   d. QA Records Reviewers - Ebasco Procedure QAI-14, "Training and Qualification Requirements for Quality Assurance Records Personnel". Qualification requirements are high school graduate or G.E.D., QA Indoctrination, procedural training, and on-the-job training.
   e. Nondestructive Testing Personnel - SNT-TC-1A and Ebasco Procedure NDE-1, "Ebasco Service Incorporated Procedure for Training, Examination, and Certification of Nondestructive Examination Personnel".
   f. QC Personnel - ANSI N45.2.6, 1973 and Ebasco Procedure ASP-I-3, "Indoctrination and Training".

tor Qualification and Dispositioning of Deficiencies:

ss)

ATTACHMENT 1

C. AMERICAN BRIDGE

1. On-Site Dates: March 1977 to May 1980

2. Scope of Work:

Erection of main and miscellaneous structural steel in the following areas; reactor building, reactor auxiliary building, fuel handling building, cooling tower area, turbine generator area, circulating water system and construction trestle.

3. Scope of Inspection:

a. Receiving inspection (upon receipt from Ebasco warehouse).
b. Fit-up, in-process, and final visual inspection of welds on structural steel.
c. Inspection of high strength bolting, including torque inspection.
d. Inspection of installation of expansion type concrete anchors.
e. Calibration of inspection and testing equipment.
f. Housekeeping inspection.

4. QA Program Requirements/Contractual Commitments:

a. QA Personnel except Auditors - ANSI N45.2.6 and Procedure 14, "Personnel Training and Qualification".
b. QA Auditors - ANSI N45.2.23, Quality Assurance Manual Section 1.18 and Procedure 8, "Audit Procedure".
c. QC Inspectors - ANSI N45.2.6 and Procedure 14, "Personnel Training and Qualification".

5. Inspector Qualification and Dispositioning of Deficiencies:

All American Bridge QC inspectors are determined to have been qualified.

ATTACHMENT 1

D. B&B INSULATION

1. On-Site Dates: April 1982 to Present

2. Scope of Work:

   a. Installation of penetration, radiation shields, fire stops, and air seals.
   b. Installation of ventilation equipment providing ventilation for curing penetration seal materials.
   c. Installation of flexible boot seals.
   d. Seal internal conduit seals.
   e. Drill holes in flange of HVAC penetration for sealing material.
   f. Installation of protective envelop for cable tray, conduit, cable airdrop and junction boxes.

3. Scope of Inspection:

   a. Material Receiving Inspection
   b. Inspection performed on Electrical Cable Tray and Conduits are as follows:
      1. Penetration Seals Inspection
      2. Cable Tray Wrap Inspection
      3. Fire Protection Inspection

4. QA Program Requirements/Contractual Commitments:

   a. QA Personnel - No procedural requirements for qualification.
   b. QC Inspectors - B&B Procedure QCP-0010, "Certification of Inspection and Examination Personnel", which meets the intent of ANSI N45.2.6.

5. Inspector Qualification and Dispositioning of Deficiencies:

   (In Progress)

ATTACHMENT 1

E. CHICAGO BRIDGE & IRON

1. On-Site Dates: June 1976 to April 1978

2. Scope of Work:

   a. Erect Steel Containment Vessel complete with all appurtenances, equipment hatches, personnel locks and penetrations.
   b. Post-weld heat treat Steel Containment Vessel.
   c. Test Steel Containment Vessel.
   d. Purchase Order includes applicable NDE.
   e. Purchase Order, also covers design, fabrication, delivery, and handling of Steel Containment Vessel.

3. Scope of Inspection:

   a. Receiving inspection.
   b. Visual inspection of welds; fit-up, in-process, and final weld.
   c. Perform and evaluate NDE of welds (MT or LP and RT, as applicable).
   d. Dimensional inspection.
   e. Witness and evaluate site testing within CB&I work scope.
   f. Assure calibration of jobsite M&TE is performed within CB&I work scope.
   g. Test of Steel Containment Vessel includes Soap Bubble Tests, Overhead Pressure Test, Leak Plate Tests (including personnel locks) and operational testing.

4. QA Program Requirements/Contractual Commitments:

   a. QA Personnel - CBI Procedure TIP-1, "Training Indoctrination and Qualification Program". This procedure references CBI's QA manual Appendix C for auditors and Appendix J for NDE personnel. NDE personnel are certified to SNT-TC-1A requirements.
   b. QC Personnel - CBI Procedure TIP-1, "Training Indoctrination and Qualification Program".

5. Inspector Qualification and Dispositioning of Deficiencies:

   All Chicago Bridge & Iron QC Inspectors are determined to have been qualified.

ATTACHMENT 1

F. COMBUSTION ENGINEERING

1. On-Site Dates: March 1982 to January 1984

2. Scope of Work:

   a. Provide Reactor Vessel Internals installation assistance.
   b. Perform related work.
   c. Related work includes installation procedures, technical direction, MFR., services and drawings, provide QA personnel, alignment meets requirements of C-E reactor vessel internals installation manual.

3. Scope of Inspection:

   a. Work by contractor subject to inspection and testing by Owners Testing Lab.
   b. Administrative functions by contractors.

4. QA Program Requirements/Contractual Commitments:

   a. All QA/QC Personnel - Training to CE Avery Division QA Program, Standards, Specifications, Codes, QA responsibilities and documentation.
   b. QA Auditors - Orientation and training, examination, on-the-job training, and maintain proficiency through active participation.
   c. Records Control Personnel - QC Software training, time requirements are based on level of certification.
   d. Inspector Personnel - Visual Inspection SNT-TC-1A and Dimensional and Mechanical ANSI N45.2.6.

5. Inspector Qualification and Dispositioning of Deficiencies:

   All Combustion Engineering QC inspectors are determined to have been qualified.

ATTACHMENT 1

G. FISCHBACH AND MOORE

1. On-Site Dates: May 1977 to December 1983

2. Scope of Work:

   a. Installed safety and non-safety equipment, accessories, raceways, cable and non-vendor furnished interconnection between equipment, connections to all equipment, accessories and devices.
   b. Installed seismic and non-seismic conduit, tray and box supports (AWS D1.1).
   c. Installed expansion anchors and bolting of structural steel.

3. Scope of Inspections:

   a. Material Receiving inspection.
   b. Support fit-up and final visual inspection.
   c. Inspection of installation of equipment.
   d. Inspection of routing and connection of trays and conduit.
   e. Inspection of routing and termination of cable.
   f. Inspection for proper bolting (Torque and tension testing).
   g. Megger/continuity testing of cable and equipment.

4. QA Program Requirements/Contractual Commitments:

   a. QA Personnel - 10CFR50 Appendix B and ANSI N45.2.
   b. QA Auditors Personnel - Documented experience of previous auditing, orientation, and training in QA program, procedures, and activities to be audited.
   c. Inspector Personnel - ANSI N45.2.6 and Fischbach & Moore Procedure QAP-101W3, "Personnel Qualification and Certification".

5. Inspector Qualification and Dispositioning of Deficiencies:

   (In Progress)

ATTACHMENT 1

H. GEO (NDE)

1. On-Site Dates: May 1977 to Present

2. Scope of Work:

   a. Performance of Nondestructive examination of items and welds designated by the Client.
   b. Process and evaluate test results.
   c. Prepare reports.
   d. Identify defects.

3. Scope of Inspection:

   a. Nondestructive examination methods include but are not limited to: Radiography, Magnetic Particle, Ultrasonic, Liquid Penetrant, and Lead Detection.
   b. Client has final acceptance or rejection of welds.
   c. Although leak detection was included in GEO scope of work, GEO was not required to perform any tests.

4. QA Program Requirements/Contractual Commitments:

   a. QA Personnel except Auditors - No Procedural requirements for qualification.
   b. QA Auditors - GEO Procedure 5.2, "Qualification and Certification of Audit Personnel" which references ANSI N45.2.23.
   c. Nondestructive Examination Personnel - SNT-TC-1A and GEO Procedure GEO-2.3, "Qualification and Certification of NDE Personnel".

5. Inspector Qualification and Dispositioning of Deficiencies:

   The verification program identified one (1) GEO (NDE) individual who performed radiography tasks and whose qualifications were determined as not meeting the requirements of SNT-TC-1A. Corrective Action Report EQA84-14 was initiated to track the disposition of this deficiency.

   It has been determined that the individual in question performed only field radiography work and was not involved in interpretation of radiographs. Had field radiographs by this individual been defective, this would have been obvious and would have been detected during the interpretation of the radiography, which was performed by personnel whose qualifications in accordance with SNT-TC-1A have been verified.

ATTACHMENT 1

I. GULF ENGINEERING

1. On-Site Dates: January 1977 to November 1983

2. Scope of Work:

   a. Install ASME III Safety Class I, II, III, and Non-safety related (B31.1) equipment tank, pressure vessels, etc.
   b. Install ASME III Class III piping systems.
   c. Install Seismic Class I supports.
   d. Hydrostatic/Pneumatic testing on all systems erected.

3. Scope of Inspection:

   a. Material Receiving Inspection.
   b. Fit-Up and Final Visual for structural welds.
   c. Fit-Up and Final Visual for pipe welds.
   d. Insulation Resistance Testing Inspection - PR-9.2.
   e. Grouting Inspection PR-11.1.

4. QA Program Requirements/Contractual Commitments:

   a. QA Personnel with exception of Auditors - Gulf Engineering QA Manual Section 20, Indoctrination and Training, Gulf Procedures PR 17.0 and 20.0, "Indoctrination and Training".
   b. QA Auditors - ANSI N45.2.23 and Gulf Procedure PR 18.0, "Auditing".
   c. QC Inspectors - ANSI N45.2.6 and the Gulf Program requirements listed in (a).

5. Inspector Qualification and Dispositioning of Deficiencies:

   (In Progress)

ATTACHMENT 1

J. MERCURY COMPANY OF NORWOOD

1. On-Site Dates: September 1978 to November 1983

2. Scope of Work:

   a. Intall ASME III P2 and P3 local instrument racks, cabinets, and tubing systems.
   b. Install seismic Class I supports and tubetrack.
   c. Install non-seismic/non-safety instrument air system.
   d. Install non-seismic supports.
   e. Hydrostatic or air test all tubing erected.

3. Scope of Inspection:

   a. Receiving Inspection
   b. Dimensional Inspection
   c. Structural Inspections
   d. Pressure Test Performance
   e. Welding Inspection
   f. Piping and Tubing Inspection
   g. Installed Equipment Inspection

4. QA Program Requirements/Contractual Commitments:

   a. QA Engineering Personnel - Mercury Procedure QCP-3070, "Personnel Indoctrination and Training".
   b. Quality Managers/Supervisors - Mercury Procedure QCP-3070, "Personnel Indoctrination and Training".
   c. Quality Assurance Auditors - Mercury Procedure QCP-3060, Qualification of "QA Program Audit Personnel" which satisfies the requirements of ANSI N-45.2.23.
   d. QA Records Reviewers - Mercury procedure QCP-3070, "Personnel Indoctrination and Training".
   e. Nondestructive Testing Personnel - Mercury employed no NDE personnel.
   f. QC Personnel - ANSI N45.2.6 and Mercury Procedure QCP-3050, "Qualification of Inspection, Examination and Test Personnel".

5. Inspector Qualification and Dispositioning of Deficiencies:

Using conservative standards as defined in the basic response, preliminary results indicate that a significant number of Mercury inspectors did not fully meet the criteria of ANSI N45.2.6-1973. The final results of the review of Mercury inspector qualifications will be provided in a supplemental response. Corrective Action Request EQA84-15 was initiated to track the disposition of this deficiency.

Disposition of CAR EQA84-15 is based upon the extensive reinspections of Mercury work against established installation criteria and upon extensive testing and engineering evaluation of the as-built installations. Based on these factors, LP&L has a high degree of confidence in the ability of the installation within the scope of Mercury's responsibility to perform its intended safety functions and support safe plant operation. In light of the extensive verification, this conclusion is justified even if a substantial number of Mercury inspectors do not satisfy qualification requirements.

Attachment No. J-1 provides a matrix of inspection and NDE tests performed as part of the in-process installation activities in Mercury's work scope. The various reinspection, test and engineering verification activities are also tabulated in relation to the impacted Mercury installations.

Attachment No. J-2 is a description of several of the verification activities additionally considered in this assessment.

Attachment No. J-3 is an assessment of safety significance with respect to the findings identified in the N1 installation reinspections recently completed by LP&L.

The figure contained in Attachment J-4 represents Mercury's work scope pictorially for the categories of installations described above.

Mercury's construction activities which are affected by QC inspector qualifications have been categorized as follows:

A. N1 Installations

N1 installation include tubing, instrumentation and related hardware which perform a function required to mitigate the consequences of a design basis accident and allow the operator to safely shutdown the plant.

B. N2 Installation

N2 installations include tubing, instrumentation and related hardware required to maintain pressure boundary integrity that do not perform a direct plant safety function.

C. Seismic Category I Instrumentation Supports, Tube Track, and Instrumentation Stands

These installations are required to withstand a safe shutdown earthquake and thus assure the integrity of N1 and N2 installations.

D. Primary Sampling Piping and Related Supports/Restraints

These installations consist of Seismic Category 1 pipe supports and ASME Class 2 piping.

Verification activities independent of the initial in-process inspections are discussed in relation to each category of Mercury installation.

A. N1 Instrumentation

Due to its importance to safe plant operations, N1 instrumentation has undergone the most extensive re-verifications of any Mercury installation category. These verification activities are summarized as follows:

1. Reinspections

Reinspections performed in relation to N1 instrumentation include the following:

a. N1 Reinspection Program

As a result the LP&L Review of NRC Issue No. 1 regarding Mercury QC qualifications, LP&L deemed it prudent to undertake a further extensive reinspection of Mercury work. Accordingly, LP&L procedure QASP 19.15 was established to reinspect the sensing lines and associated hardware (e.g. tube track, support, etc.) for the N1 instrument installations, which perform a safety-related function and provide a pressure boundary. The reinspection is complete and no discrepancies impacting plant safety were found. This reinspection covered most of the installation attributes which are subject to in-process QC inspections.

Certain attributes such as anchor bolt torquing and weld fitup inspection were not included since reverification cannot be performed without destroying existing installations. Such attributes, however, were subjected to many in-process inspections and subsequent documentation reviews as is evidenced by the numerous NCRs which were dispositioned in these areas. The adequacy of Mercury anchor bolt installations was further later verified by Ebasco based on the corrective action required to close NCR 5864. This NCR required tension test verification of 108 Mercury installed anchor bolts.

An evaluation of the reinspection findings was performed for safety significance. The evaluation results and inspection findings are discussed in detail in Attachment J-3. It has been concluded that, while deviations from established installation criteria were identified, none were judged to be safety significant. Further, in relation to the quantity of items reinspected, the number of identified discrepancies is small.

b. LP&L QA Inspection of Redundant N1 Instrumentation Impulse Lines for Mechanical Separation

This reinspection was performed under direct LP&L supervision in accordance with LP&L Procedure QASP 19.9. The inspection required the reverification of mechanical separation requirements for redundant N1 instrumentation installations. As a result of this program, 2 out of 82 instrument installations inspected were reworked to assure proper mechanical separation.

c. SCD 57 Correction Action Program

This reinspection effort commenced in July, 1982, and subsequently involved the reinspection of all N1 and N2 instrumentation installed in full or in part prior to July 1982. Although these reinspections may have been performed by some of the QC inspectors whose credentials are currently suspect, this is mitigated by the fact that Ebasco Engineering participated in the tubing installation walkdowns. LP&L QA and Startup also participated in many of the walkdowns.

d. Selective Reinspection Programs Impacting N1 Installation

Various reinspection programs were initiated by LP&L and Ebasco QA in relation to established review programs in the 1982-1983 time frame. These reinspections impacted N1 Instrumentation, and are described as follows:

i) Ebasco QA Records Review Program Reinspections

During the records review process a limited number of reinspections were performed in order to reverify specific attributes related to tubing installations. Refer to Attachment No. J-2 for more detail.

ii) LP&L QA Turnover Status Review

A limited number of field verifications were conducted by LP&L QA as part of a system turnover status review. These field verifications established a satisfactory level of confidence that the as-installed conditions were reflective of the approved installation details. Refer to Attachment No. J-2 for more detail.

2. Testing

Various NDE and testing programs have been implemented which provide additional assurance with respect to the adequacy of N1 installations. These programs are summarized as follows:

a. Pressure Boundary Tests

In general, N1 and ASME Class 2 and 3 tubing installations were integrity tested in accordance with code requirements. Certain N1 HVAC installations were exempted from integrity testing. In addition to Mercury QC inspectors, ASME integrity tests were witnessed by Ebasco, LP&L Startup and QC personnel, and in the case of Class 2 installation, the Mercury ANI representative.

b. Non-Destructive Testing

N1 ASME Class 2 installations welds were subjected to liquid penetrant tests which were performed by an independent contractor (GEO).

c. Hot Functional Preoperational Testing

During Pre-Core Hot Functional Testing, N1 instrumentation was placed in service under normal plant operating conditions. The integrity of these installations was verified under thermal growth and pressure conditions by LP&L. Instrumentation loop functionality under plant startup and normal process flow conditions was also verified. These same systems will again be tested during Post Core Hot Functional Testing, prior to initial criticality.

B. N2 Installations

N2 installations were subjected to many of the same reverification programs. The major LP&L programs which did not involve N2 installations are the N1 instrumentation reinspection conducted by LP&L (Item A.1.a) and the LP&L QA inspection of redundant N1 instrumentation for Mechanical Separation (Item A.1.b).

The most noteworthy reverification efforts with respect to N2 installations involve the SCD 57 corrective action programs and pre-core hot functional testing programs. The comprehensiveness of these two programs mitigate the consequences resulting from the QC inspection qualification concerns. Attachment No. J-3 discusses the justification for not extending the reinspection program conducted under QASP 19.15 (Item A.1.a) to include N2 installation.

C. Seismic Category I Supports, Tube Track and Instrumentation Stands

As has been the case with N1 and N2 installation, Seismic Category I supports, tubetrack and instrumentation stands have been subjected to various reinspections and verification programs. The most notable are discussed below.

1. The N1 reinspections conducted by LP&L under procedure QASP 19.15 included reinspections of Seismic Category I supports installed in N1 instrument loops. Attributes inspected included support location, weld size and workmanship, anchor bolt embedment, spacing, and correctness of hardware installations (i.e. nut, bolts, washer, etc.). Approximately 1600 supports were inspected under the program.

2. The Ebasco QA Records Review Program Reinspection

The QC reinspection conducted by Ebasco in 1982-1983 involved approximately 35% of all Mercury installed instrumentation seismic supports. These reinspections verified support configuration, locations and weld size. Partial inspection for only certain attributes (i.e. support type or weld size, etc.) were also conducted. In addition to Seismic Category I supports, the QA Records review resulted in the full reinspection of 100% of the Seismic Category I instrument stands installed by Mercury and approximately 67% of the tube track installation including hardware and welds. Anchor bolt embedment and torque were reverified in 896 instances. More detail with respect to the impact of the Ebasco QA records review on Seismic Category I hardware is provided in Attachment No. J-2.

D. Primary Sampling Piping and Related Supports/Restraints

This portion of Mercury work has been reverified in several ways. These are summarized as follows:

1. Reinspection

a. Piping fillet welds were reinspected under SCD 62 which involved identification and repair of undersized fillet welds not meeting ASME Code requirements. Although reinspections may have been done by some of the same QC inspectors whose credentials are currently under question, the impact of their involvement is minimized since at least 2 inspectors looked at each weld.

b. All the Primary Sampling Supports/Restraints were reinspected by Ebasco QC during the QA records review process.

c. Both the piping and supports/restraints were verified by Ebasco ESSE as part of the 79-14 program.

d. Primary Sampling Supports/Restraint were reinspected by LP&L QA as part of the QASP-19.7 pipe hanger inspection program.

2. Testing

a. ASME Code Hydros of Primary Sampling Piping

ASME Code hydros were witnessed by the Mercury ANI, LP&L Startup and Ebasco Engineering.

b. Non-Destructive Testing

Since the primary sample tubing is ASME Class 2, all fillet welds were liquid penetrant tested by GEO.

c. Hot Functional Testing (HFT)

During Pre-Core HFT, the Primary Sampling System was subjected to normal operating pressure and temperature conditions. Formal verification of the adequacy of installation was documented under the thermal monitoring program conducted during HFT. Similar postcore testing will be performed.

The extent of reinspection testing and engineering verifications conducted in relation to the Mercury installed Primary Sampling System is so comprehensive that the impact of QC inspector qualifications is insignificant with respect to plant safety.

SUMMARY AND CONCLUSIONS

In each installation category, several reverification and testing activities have been performed which did not involve Mercury QC inspectors. When reinspection activities were performed by Mercury QC inspectors, credit is taken in this assessment due to either of two factors:

1. The Mercury QC inspector was accompanied by either an LP&L or Ebasco representative or both (eg. SCD 57 walkdowns, hydros, etc.)

2. The reinspection was a duplication of previous reinspections, and thus the impact of inspector qualification to ANSI N45.2.6-1973 is minimized.

In conclusion, the extent to which Mercury installations were reverified by either testing, reinspection or engineering verification, substantially independent of the Mercury QC inspection process, provides sufficient confidence that safety related instrumentation has been properly installed.

ATTACHMENT J-1

ATTACHMENT J-1

COMPONENT	I&C CLASS	QTY. INVOLVED	PRIMARY WELD CONFIGURATION	QC INSPECTION PERFORMED	ASME CODE INSPECTION	NDE	INTEG. TEST	DOCUMENT REVIEW MERC.	EBASCO	LPL	OTHER
Tubing	P2N1	51 Travelers (Approx.)	1/8" Socket Weld	1. Cleanliness 2. Component Verified 3. HT Component No. Verified 4. HT & Type Filler Metal 5. Fit-Up 6. Final 7. Welder ID 8. Weld No. 9. Mechanical Separation	Indep.exam. by Kemper Insurance Record Review (100%) Physical Inspection (Approx 2%)	Indep. Exam. By GEO Liq. Penet. (100%)	100%	100%	100%	15%	1) SCD 57 2) QASP-19.15 3) QASP-19.9
Tubing	P2N2	35 Travelers (Approx.)	1/8" Socket Weld	1. Cleanliness 2. Component Verified 3. HT Component No. Verified 4. HT & Type Filler Metal 5. Fit-Up 6. Final 7. Welder ID 8. Weld No.	Indep.exam. by Kemper Insurance Record Review (100%) Physical Inspection (Approx 2%)	Indep. Exam. By GEO Liq. Penet. (100%)	100%	100%	100%	15%	1) SCD 57
Tubing	P3N1	189 Travelers (Approx.)	1/8" Socket Weld	1. Cleanliness 2. Component Verified 3. HT Component No. Verified 4. HT & Type Filler Metal 5. Fit-Up 6. Final 7. Welder ID 8. Weld No. 9. Mechanical Separation			100% With Except of HVAC	100%	100%	15%	1) QASP-19.15 2) QASP-19.9 3) SCD 57

ATTACHMENT J-1

COMPONENT	I&C CLASS	QTY. INVOLVED	PRIMARY WELD CONFIGURATION	QC INSPECTION PERFORMED	ASME CODE INSPECTION	NDE	INTEG. TEST	DOCUMENT REVIEW MERC.	EBASCO	LPL	OTHER
Tubing	P3N2	95 Travelers (Approx.)	1/8" Socket Weld	1. Cleanliness 2. Component Verified 3. HT Component No. Verified 4. HT & Type Filler Metal 5. Fit-Up 6. Final 7. Welder ID 8. Weld No.			100% With Except of HVAC	100%	100%	15%	1) SCD 57
P2 Sample Pipe	P2	10 Drawings	1/4" Socket Weld	1. Cleanliness 2. Component Verified 3. HT Component No. Verified 4. HT & Type Filler Metal 5. Fit-Up 6. Final 7. Welder ID 8. Weld No.	Indep. Exam. By Kemper Insurance Record Review (100%) Physical Inspection (Approx 2%)	Indep. Exam By GEO Liq. Penet. (100%)	100%	100%	100%	15%	1) SCD 62 2) SCD 57
Strong Back Piping for Level Switches	P3N1	7 Tanks	1/4" Socket Weld	1. Cleanliness 2. Component Verified 3. HT Component No. Verified 4. HT & Type Filler Metal 5. Fit-Up 6. Final 7. Welder ID 8. Weld No. 9. Mechanical Separation			100%	100%	100%	15%	1) SCD 57 2) QASP-19.15 3) QASP-19.9
Tubetrack	Seismic CL I	650 (Approx.)	Fillet				-		100%	10%	1) 67% Under QAI-23 2) QASP 19.15 (NI Only)

ATTACHMENT J-1

COMPONENT	T&C CLASS	QTY. INVOLVED	PRIMARY WELD CONFIGURATION	QC INSPECTION PERFORMED	ASME CODE INSPECTION	NDE	INTEG. TEST	DOCUMENT REVIEW MERC.	EBASCO	LPL	OTHER
Tubing & Tubetrack Supports	Seismic CL I	5100 (Approx.)	Fillet	1. Cleanliness 2. Component Verified 3. Heat No. Component Verified 4. HT & Type Fillet Metal 5. Fit-Up 6. Welder ID 7. Weld No. 8. Final				75%	100%	10%	1) 35% Under QAI-23 2) QASP-19/15 (Ni Only)
Bergen-Paterson Supports	Seismic CL I	310 (Approx.)	Fillet	1. Cleanliness 2. Component Verified 3. HT No. & Type Filler Metal 4. Welder ID 5. Weld No. 6. Fit-Up 7. Final				Not Comp.	100%	10%	1) Ebasco QC 100% reinspection 2) 79-14 Walkdown 3) QASP-19.7
Instrument Stands	Seismic CL I	200 (Approx.)	Fillet	1. Cleanliness 2. Component Verified 3. HT No. OF Component Verified 4. HT & Type Filler Metal 5. Welder ID 6. Weld No. 7. Fit-Up 8. Final				Not Comp.	100%	10%	1) 100% Under QAI-23 2) QASP-19.15 (Ni Only)

ATTACHMENT NO. J-2

VERIFICATION OF THE ACCEPTABILITY OF MERCURY INSTALLATIONS

Since the Stop Work Order on Mercury safety related activities was issued in July 1982, Mercury installed systems have been heavily scrutinized by LP&L and Ebasco. The Mercury installations have also been subjected to NRC field review. Additionally, Kemper Insurance participated in the ASME Section III N-Stamp application process and, as such, was required to witness hydrostatic testing of all ASME Safety Class 2 installations.

The following is a brief discussion of some of the significant LP&L and Ebasco verification activities with respect to Mercury installations.

1. A direct result of the Stop Work Order, was the initiation in July 1982 of joint Mercury and Ebasco walkdowns of instrumentation installations on a startup system basis. LP&L QA and Startup were involved in the initial phases of the program. Walkdown results were documented on punch lists and evaluated for nonconforming conditions and establishment of corrective action. The walkdowns were conducted in two phases. The first phase consisted primarily of tubing along with the associated tubetrack and clamps. The second phase, which commenced in January 1983, consisted of a walkdown of supports. The walkdowns resulted in the generation of a large number of NCRs and rework. Attachments 2, 3 and 3F of the response to NRC Issue 23 discuss the significance of the NCRs.

2. In addition to LP&L QA participation in the corrective action walkdowns discussed above, LP&L QA performed a status review at the time of system turnover in accordance with the requirements of LP&L Procedure QASP 17.5. This review consisted of a minimum 10% review of the documentation, and a random field sampling of hardware versus as-built drawings. Portions of the Mercury installation for the following startup systems were field verified:

   18-3, 25-9, 36-1, 36-3, 39, 43A, 43B, 43E, 43H, 43J, 46A, 46B, 46C, 46D, 46E, 46H, 52A-1, 52A-2, 52B, 52C, 53A, 55A,56A, 58, 59, 60A, 60B, 60C, 66, 71B, 73 and 76.

   As a result of these reviews, LP&L was able to conclude that the as-built conditions generally reflected the system drawings, and that no significant hardware deficiencies were encountered.

3. Ebasco conducted various other field verification activities relative to Mercury installations. These are summarized as follows:

   a. As part of the closure of SCD 57, Ebasco QA initiated a corrective action supplement which consisted in part of a sample field inspection of various attributes related to Mercury installations. This inspection took place in February, 1984.

b. Ebasco Engineering conducted a plant walkdown in order to identify and correct miscellaneous hardware deficiencies which normally result from ongoing construction activities. This walkdown was conducted in accordance with Ebasco Procedure ASP-IV-141 and included all safety related areas of the plant. Deficiencies, along with QA/QC verification of corrective action on safety related items, were documented on punch lists. The program was established in support of the area closeout and transfer process, which took place in March, 1984 through May, 1984. This walkdown provided another level of assurance on the Mercury installations.

c. Since August 1982, the Ebasco QA Surveillance Group has conducted 48 documented surveillances of Mercury hardware and documentation. Any findings were resolved and, when necessary, NCRs were initiated to evaluate potentially significant discrepancies. The activities of the Ebasco QA Surveillance Group are discussed in greater detail in Attachment 3 to the response to NRC Issue 23. Generally, this in-process surveillance program provided another means of monitoring Mercury activities, thus ensuring the adequacy of the installations.

4. The most significant activity, aside from the corrective action walkdown discussed in Item 1, involved the Ebasco QA records review of Mercury documentation. This review was necessary due to the demobilization of Mercury in August of 1983 without the completion of the Mercury records review. The review commenced in November, 1983 and was completed in March, 1984. A group of 46 QA reviewers, inspectors, supervisors and clerical staff was assembled for this effort. The review was conducted in accordance with QA instruction QAI-23. As deficient or missing documents were identified, QC inspectors were dispatched to reverify the installations. As a result, approximately 67% of tube track installations were reinspected; approximately 35% of Seismic Category 1 supports were reinspected; and approximately 24% of the Mercury installed anchors were reverified for proper torque. Attachment 5A to the response to NRC Issue 23 provides a summary of the review and reinspection scope resulting from the Ebasco QA records review. Available records indicate that an insignificant amount of rework resulted from the reinspection process.

SUMMARY OF THE EBASCO QA RECORDS REVIEW

I. The following is a summary of the work scope related to the Mercury documentation review conducted by Ebasco QA. Further, a summary of field QC verifications resulting from the review process is provided in Section II.

A. Tubing Installations Records Review

Review Scope	ASME Section III-Class 2	ASME Section III-Class 3	Total
Number of Systems	13	36	49
Number of Mercury Travelers (OCRs)	86	284	370
Number of Instruments	150	835	985

B. Seismic Category I Support, Tube Track, and Other Miscellaneous Hardware Installations

Review Scope	Quantity
Tube Track Supports	3142
Primary Sample Line Pipe Supports	314
Tube Track Installations	665
Instrument Stands	184
Bulk Fabricated Supports/Fittings/ Anchor Plates	7230 (Approx.)
Instrument Mounts	267

II. QA reinspections were initiated in order to resolve documentation deficiencies identified in the review process. A summary of reinspections is as follows:

A. Tubing Installations

Reinspections were initiated to verify the following:

Attribute	Quantity
Heat Number	30
Material Identification	15
Welder's I.D.	11
Tube Slope	4
Verify Repair of Damaged Tubing	7
Wall Thickness	2
Defective Weld	1
Instrument Installation	3
TOTAL	73 (Note 1)

B. Supports/Tube Track and other miscellaneous Seismic Category 1 installations.

Reinspections were initiated to verify the following:

Attribute	Quantity
Support Configuration, Location & Welds	2058
Tube Track	514
Instrument Stands	211
Torque Verification of Anchor Bolts Including Proper Embedment and Thread Engagement	896
Support Type Only	159
Final Visual of Support Weld Only	88
Pipe Support Configuration	77
Miscellaneous Attributes (Ht. No., Welder I.D., Etc.)	216
TOTAL	4219 (Note 1)

As a result of these reinspections, a total of 113 NCRs and 1035 Discrepancy Notices were dispositioned.

NOTE 1: Some duplication of reinspection or unsuccessful inspection is included in these numbers.

ATTACHMENT J-3

ATTACHMENT NO. J-3

SUMMARY OF MERCURY REINSPECTIONS RESULTING FROM NRC ISSUE NO. 1

As a result of the LP&L review of NRC Issue No. 1 regarding Mercury QC qualifications, LP&L deemed it prudent to undertake a further extensive reinspection of Mercury work. Accordingly, LP&L procedure QASP19.15 was established to reinspect the sensing lines and associated hardware (e.g. tube track, support, etc.) for the NI instrument installations, which perform a safety-related function and provide a pressure boundary. The reinspection is complete and no discrepancies impacting plant safety were found.

The discrepancies were sorted into the following nine categories for evaluation:

A. Overspan on tubing
B. Missing hardware (e.g. missing nuts, bolts, lockwashers, tube clamps)
C. Incorrect tubeclamp type (2D,3D)
D. Insufficient weld on support
E. Incorrectly assembled hardware, track, support, etc.
F. Undersized tubing weld
G. Anchor bolt embedment
H. Anchor bolt spacing
I. Arc strike/grind mark on weld

Table 1 summarizes the number of findings in each category.

The purpose of this attachment is to discuss the ramifications of the identified conditions with respect to plant safety and to discuss the need for further reinspections.

Category A - Overspan on Tubing

The most significant overspanned conditions found during the reinspection were analyzed under design loading conditions and determined to be within ASME code allowable stresses. The 15 cases identified as rework items involved minor relocation of clamps and were reworked rather than submitted for complete engineering evaluation. It was judged, however, that there was no safety significance with the respect to the as found conditions in this category.

Category B - Missing Hardware

Missing hardware was further broken down into two categories:

a) Missing lockwashers

b) Missing tube clamps, missing nut or bolt for tube clamp assemblies, and tube track support or track splice connections.

Missing lockwashers pose a concern in that the nut is more likely to loosen under seismic conditions. Since the nuts were found to be tight in these instances, the bolts should not loosen under short term seismic conditions.

Induced vibration in tubetrack/tubing installations due to plant normal operating conditions is minimal, and should not cause loosening of the connection.

With respect to the missing tube clamp hardware, such cases were treated as an overspan condition for evaluation. Stress analysis evaluation of the identified discrepancies concluded that the as-found condition would not result in overstressing the tubing under design loading conditions.

Missing tubetrack hardware likewise results in an overspanned condition. The resultant deflections would not result in failure of the tubing pressure boundary under design loading conditions.

In summary, none of the missing hardware items degrade the overall system integrity and thus do not preclude the system from performing its intended safety function. However, missing hardware items were reworked in accordance with installation requirements.

Category C - Incorrect Tube Clamp (2D & 3D)

The as-found conditions can be broken down further as follows:

1. Two dimensional (2D) clamps used in lieu of a three dimensional (3D) clamp.

2. Three dimensional clamp used in lieu of a two dimensional clamp.

The first condition represents no safety significance in that a 3D clamp simply provides axial restraint as well as lateral and vertical restraint. Axial restraint is also achieved by clamps installed on the tubing as it changes direction. (That is, tube clamps in a tube run on a perpendicular plane of direction to the run to be restrained will provide restraint to that run).

The condition in which a 3D clamp is used in lieu of a 2D clamp may pose a concern in that axial thermal growth would be restricted. The only case where this condition may pose a problem is when there is a straight run of tubing between two 3D clamps coupled with high maximum operating system temperatures. Only two such cases were noted out of the 68 total clamp discrepancies. Approximately 2600 tube clamps were inspected.

The probability that these lines would fail is low, since restricted growth due to cyclical thermal loading of the tube in itself would not cause a pressure boundary failure. Frequent cyclical thermal loading is not anticipated on Waterford since it is LP&L's policy to backfill instrumentation legs rather than blowdown the line. In the unlikely event of a tube failure for the two identified instrument loops (had the cases not been corrected), the failure would not have been of safety significance.

Category D - Insufficient Weld,On Support

The two identified conditions in this category were evaluated and found to be acceptable as installed, under design loading conditions. Thus, no item of safety significance was identified in this category.

Category E - Incorrectly Assembled Hardware

The 49 identified conditions consisted primarily of loose bolts. Many instances involved one loose nut in a four bolt tube track splice assembly. In such instances one bolt alone would be sufficient.

In instances of loose tube track to support bolts or tube clamp bolts, the loose nut and bolt assembly provided some clamping action, ensuring no overspan condition existed that would degrade the overall system integrity under design conditions. The instances of this condition occurring are isolated throughout all the reinspected installations, which further reduces the impact on individual system integrity.

Category F - Undersize Tubing Welds

Twenty-Five undersized welds were identified. Thirteen were acceptable based on a previous analysis (refer to NCR-W3-5850). The remaining 12 welds were repaired to meet ASME code requirements. However, in LP&L's judgement, had these undersized conditions gone undetected, the structural integrity of the weld to perform under design loading conditions would not have been compromised. Also, hydrotests performed on non-atmospheric installations provide further evidence relative to the adequacy of the weld. Given that only 12 out of the approximately 4800 welds reinspected were found to be undersized, LP&L believes that additional reinspection is not justified. None of these conditions represent an item of safety significance even though repairs were required based on ASME code requirements.

Category G - Anchor Bolt Embedments

Three of the identified conditions in this category were reworked to be consistent with installation criteria required. These were later analyzed and it was found that rework was not required and none of these conditions posed a concern relative to safety significance.

Category H - Anchor Bolt Spacing Violations

The as-found conditions in this category were evaluated and determined to be acceptable as-is under design loading conditions. Therefore, no item of safety significance was noted.

Category I - Arc Strikes & Grind Marks

Arc strikes or grind marks were identified on base metal pressure boundaries or at a weld. When buffed and measured, the as-found conditions were determined not to exceed established minimum wall thickness criteria or minimum weld size requirements. Thus no condition of safety significance was noted nor were any repairs required.

SUMMARY AND CONCLUSIONS

Conditions that have been designated for rework were done so generally to meet code requirements and to satisfy specific installation criteria. Had these conditions been left uncorrected, in LP&L's judgement, they would not have impacted the overall ability of the system to function under design loading conditions. Further, the limited number of discrepancies found in each category as compared to the total number of items inspected does not justify further reinspection of Mercury installations. This is further substantiated by the fact that most of the rework performed involved minor hardware discrepancies (i.e. categories B, C and E).

All Mercury N1 instrument tubing installations were reinspected. Reinspection of N2 instrumentation, which is only safety related with respect to its pressure boundary integrity function, is not warranted. As noted, significant pressure boundary concerns were not identified in the N1 instrumentation reinspection. Only 12 out of 4,800 welds were repaired, and these repairs were due to code requirements, and not as a result of a degraded pressure boundary integrity condition.

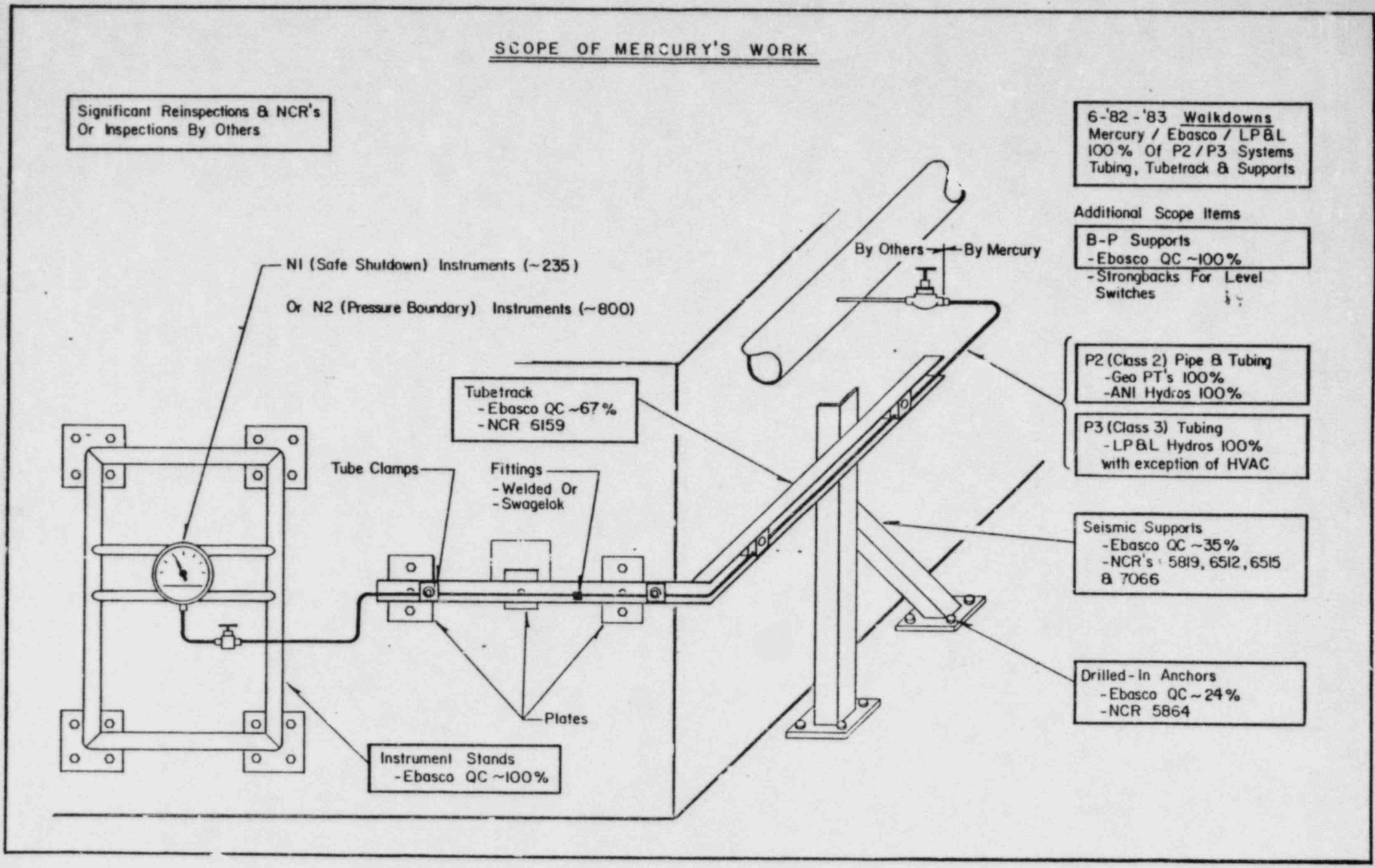
TABLE 1

SUMMARY BY DISCREPANCY TYPE

VIOLATION CODE	APPROXIMATE TOTAL ITEMS INSPECTED**	TOTAL DISCREPANCIES IDENTIFIED*		TOTAL NUMBER OF REWORK ITEMS	ACCEPTED AS IS
		CITED	ACTUAL		
A	10,500 ft.	55	21	15	6
B	5,500	75	67	67	0
C	2,600	68	68	68	0
D	3,700	15	2	0	2
E	5,500	60	49	49	0
F	4,800	25	12	12	0
G	3,600	40	3	3	0
H	3,600	88	42	0	42
I	10,500 ft.	7	7	0	7
TOTAL		430	274	221	53

* QASP19.15 contained basic design criteria that had to be inspected against. This procedure did not account for previous analysis, unique installation details or certain criteria identified in the installation details notes section. The actual number of discrepancies reflect the valid violations from the specified detailed design criteria.

** Estimate based on typical installation of 10,500 linear ft. of tubing with accessories.


SCOPE OF MERCURY'S WORK
Significant Reinspections & NCR's Or Inspections By Others
6-'82 - '83 Walkdowns
Mercury / Ebasco / LP&L
100% Of P2 / P3 Systems
Tubing, Tubetrack & Supports
Additional Scope Items
B-P Supports
- Ebasco QC ~100%
- Strongbacks For Level Switches
By Others
By Mercury
NI (Safe Shutdown) Instruments (~235)
Or N2 (Pressure Boundary) Instruments (~800)
Tubetrack
- Ebasco QC ~67%
- NCR 6159
P2 (Class 2) Pipe & Tubing
- Geo PT's 100%
- ANI Hydros 100%
P3 (Class 3) Tubing
- LP&L Hydros 100% with exception of HVAC
Tube Clamps
Fittings
- Welded Or
- Swagelok
Seismic Supports
- Ebasco QC ~35%
- NCR's: 5819, 6512, 6515 & 7066
Plates
Drilled-In Anchors
- Ebasco QC ~24%
- NCR 5864
Instrument Stands
- Ebasco QC ~100%

ATTACHMENT 1

K. NISCO

1. On-Site Dates: August 1978 to October 1983

2. Scope of Work:

a. Installation of Reactor Coolant Pumps.
b. Installation and final setting of reactor vessel and (2) steam generators.
c. Installation of Reactor Vessel head.
d. Installation and assembly of fuel handling system.
e. Fabrication and installation of seismic Class I supports.
f. Installation of pool seal ring/rolling missile shield.
g. Perform hydrostatic testing on all systems installed.
h. Perform insulation resistance testing on electrical equipment.
i. Assembly and installation of CEDM system magnetic jack assemblies.

3. Scope of Inspection:

a. Material Receiving Inspection.
b. Inspection of fit-up and final welds.
c. Inspection of Proper Bolting (Torque and Tension).
d. Installed Equipment Inspection.
e. Hydrostatic Testing Inspection.
f. Insulation Resistance Testing Inspection.

4. QA Program Requirements/Contractual Commitments:

a. Quality Personnel (including Auditors, QC Inspectors, and QA Surveillance Personnel) - Nisco's contract required all personnel to receive indoctrination and technical training.
b. QA Auditors - Nisco Procedure ES-116-3, "Qualification Certification of Audit Personnel" required completion of self study courses, on-the-job training, and oral or written examinations.
c. QC Inspectors/QA Surveillance Personnel - ANSI N45.2.6, Nisco Procedure ES-116-2, "Qualification and Certification of Inspection Personnel", and Nisco Procedure ES-117, "Inspection, Testing, and Examination Personnel Training Procedure".

5. Inspector Qualification and Dispositioning of Deficiencies:

The verification program identified one (1) NISCO QC inspector who performed Level II inspections for approximately 5 months and whose qualifications were determined as not meeting the requirements of ANSI N45.2.6-1973 for Level II during that period of time. Corrective Action Report EQA-84-4 was initiated to track the disposition of this deficiency.

The Level II qualifications of the identified individual had been questioned in 1980 in a finding resulting from an LP&L audit of NISCO (LP&L Audit NO. 80-25). Corrective action taken by NISCO to resolve that finding was accomplished shortly after the LP&L audit and included removal of the Level II certification for the individual and reinspection of the installations which he had inspected as a Level II inspector. The quality of the construction activities inspected by the individual in question was further confirmed by acceptable NDE reports. See NISCO Letter, dated July 16, 1980, attached.

ATTACHMENT K-1

NUCLEAR INSTALLATION SERVICES COMPANY

P. O. BOX 425 NITRO, WEST VIRGINIA 25143

(304) 755-0101 • TWX 710-938-1696

July 16, 1980

EBASCO Services, Inc.
P. O. Box 70
Killona, LA 70066

Attention: Mr. L. A. Stinson
Manager
Site Quality Program

Subject: Louisiana Power and Light Company
Waterford Steam Electric Station
1980 - 1165 MW Installation - Unit #3
Contract W3-NY-18
Inspector Certification - K. J. Rogers

Dear Mr. Stinson:

The Level II Certification of our K. J. Rogers has been questioned as a result of a recent NRC inspection and L.P.&L. Audit No. 80-25. We have previously expressed our opinion on this subject, referencing the approved procedure (ES-116-2) in use at the time of original certification (dated 2/11/80); however, we do realize that Mr. Rogers' experience falls short of the recommended experience provided in ANSI N45.2.6, and that required by our revised Certification Procedures. In light of this information we are at this time formally withdrawing these Level II certifications. Mr. Rogers will continue to function as a Level I Inspector, as he has done since this problem was identified, until such time that he reaches the degree of experience required by our ES-116-2 for Level II Certification.

We have reviewed work previously performed by Mr. Rogers and have determined this work to be acceptable. The following pages show a list of items inspected by this individual, as well as a corresponding list of acceptable NDE reports as provided by the Site NDE Subcontractor.

1. CEDM UPPER SEAL WELDS:

Location No.	PCS No.	ITEM / TYPE INSPECTION	NDE REPORT
7	461	*Visual	PT-3381
3	457	Visual	PT-3381
4	458	Visual	PT-3381
12	466	Visual	PT-3381
28	482	Visual	PT-3402
48	502	Visual	PT-3402
80	534	Visual	PT-3402
65	519	Visual	PT-3402
41	495	Visual	PT-3402
23	477	Visual	PT-3402
18	472	Visual	PT-3415
11	465	Visual	PT-3415
19	473	Visual	PT-3415
20	474	Visual	PT-3415
36	490	Visual	PT-3468
60	514	Visual	PT-3421
76	530	Visual	PT-3421
59	513	Visual	PT-3421
42	496	Visual	PT-3421
34	488	Visual	PT-3447
27	481	Visual	PT-3447
35	489	Visual	PT-3447
43	497	Visual	PT-3447
56	510	Visual	PT-3447
68	522	Visual	PT-3447
91	545	Visual	PT-3447
77	521	Visual	PT-3447
66	520	Visual	PT-3447
54	508	Visual	PT-3496
47	501	Visual	PT-3496
55	509	Visual	PT-3496
67	521	Visual	PT-3496
79	533	Visual	PT-3496
88	542	Visual	PT-3496
86	540	Visual	PT-3496
78	532	Visual	PT-3496
87	541	Visual	PT-3496

*Visual inspection of final weld surface.

ITEM		TYPE INSPECTION	NDE REPORT
2. PIPE WELDS			
Location No.	PCS No.		
P13W1	238	Visual Final Weld	PT-3759 NISCO-025F(RT)
P7W1	228	Visual Final Weld	MT-1124 NISCO-018M(RT)

The acceptable condition attested to on the above NDE reports provides sufficient evidence that the inspection work was not detrimental to the final condition of the items.

Level I Inspection Certification in several areas will be provided to the site upon completion of a review by our current Level III Examiner.

Sincerely,

Robert P. Larkin
Manager, Quality Assurance

cc: F. R. Howard
E. Beebe - J3015
J. Moore
G. Sementi

ATTACHMENT 1

L. NOOTER

1. On-Site Dates: July 1976 to December 1981

2. Scope of Work:

Fabricate and Erect

a. Refueling Water Pool Liner
b. Condensate Storage Pool Liner
c. Reactor Building Canal Liner including Floor Embedments, Floor and Wall Embedments, and Refueling Cavity Seal Bed Plate
d. Spent Fuel Storage Pool Liner
e. Spent Fuel Cask Storage Pool Liner
f. Refueling Canal Liner
g. Spent Fuel Cask Decontamination Area Liner
h. Decontamination Room Liner

3. Scope of Inspection:

a. Receiving Inspection
b. Radiographic
c. Magnetic Particle
d. Ultrasonic
e. Liquid Penetrant
f. Leak Detection (Vacuum Box Testing)
g. Calibration of Test Equipment
h. Final Visual Weld Inspection

4. QA Program Requirements/Contractual Commitments:

a. Quality Assurance Engineer (includes Auditors) - No requirements for qualification.
b. Quality Assurance Technicians (includes Record Reviewers) - No requirements for qualification.
c. Quality Assurance Management/Supervisors - No requirements for qualification.
d. Field Inspectors - Nooter Procedure SP-18, "Qualification of Inspectors", field requirements are High School education or prior experience in manufacturing and construction, natural or corrected near distance acuity. Such that they are capable of reading the J-1 letters on the standard Jueger test chart and color vision evaluated for personnel performing color sensitive evaluations. In addition, prior to performing inspection, the inspectors are briefed on job requirements.
e. Nondestructive Examination Personnel - SNT-TC-1A and Nooter Procedure NDE-1Q, "Nondestructive Examination Personnel Qualification and Certification".

5. Inspector Qualification and Dispositioning of Deficiencies:

(In Progress)

ATTACHMENT 1

M. SLINE

1. On-Site Dates: December 1977 to August 1984

2. Scope of Work:

   a. Application of Service Level I, Level II Coatings and Balance of Plant Equipment and Structure.

3. Scope of Inspection:

   a. Surface Preparation Inspection
   b. Product Selection Inspection
   c. Paint and Protective Coating Application Inspection
   d. Workmanship Inspection
   e. Receiving and Issuing Material Inspections
   f. Calibration Inspections

4. QA Program Requirements/Contractual Commitments:

   a. QA Personnel except QA Manager - No procedural requirements for qualification.
   b. QA Manager - Sline Procedure W3-1, "Certification and Qualification of Inspectors", which requires QA Manager to be a Level III.
   c. Inspector Personnel - Sline Procedure W3-1, "Certification and Qualification of Inspectors".

5. Inspector Qualification and Dispositioning of Deficiencies:

   (In Progress)

ATTACHMENT 1

N. TOMPKINS - BECKWITH (T-B)

1. On-Site Dates: June 1977 to June 1984

2. Scope of Work:

   a. PIPING
      1. Installation of ASME III Safety Class I, II, III, and Non-Safety related (B31.1) Process Piping Systems.
      2. Installation of Pipe Flange Bolts.
      3. System Hydrostatic Testing.

   b. HANGERS
      1. Installation of associated Seismic and Non-Seismic Pipe Hangers/Supports (AWS D1.1 or ASME Section NF).
      2. Installation of Pipe Rupture and Whip Restraints including structural steel, U-bolts, restraining plates, spacers and shims for piping systems installed by T-B.
      3. Installation of expansion anchor bolts for systems installed by T-B.

3. Scope of Inspection:

   a. PIPING
      1. Fit-up and final visual inspection.
      2. Inspection of pipe flange bolts.
      3. Hydrostatic testing.

   b. HANGERS/RESTRAINTS
      1. Fit-up and final visual inspection.
      2. Inspection of high strength bolting.
      3. Inspection of expansion anchor bolts.

   c. GENERAL
      1. Material Receiving inspection.

4. QA Program Requirements/Contractual Commitments:

   a. Quality Assurance Auditors - T-B Procedure TBP-8, "Quality Assurance Audits", requirements shall have or be given appropriate training or orientation to develop their competence for performing required audits.
   b. Quality Control Inspector/QA Surveillance - ANSI N45.2.6 and T-B Procedure TBP-4, "Indoctrination, Training, and Certification of QA/QC Personnel".

5. Inspector Qualification and Dispositioning of Deficiencies:

Using conservative standards as defined in the basic response, 16 of the 147 T-B inspectors did not fully meet the criteria of ANSI 45.2.6-1973. Further, there has been a significant amount of required and elective overinspections, reinspections, tests and reviews conducted by T&B, Ebasco, LP&L and others. These are displayed on the attached Tables I & II. Brief explanations, keyed to the tables, are:

PIPING AND PENETRATIONS

(1) T-B contracted Hartford Steam Boiler, Inc., to provide third party Authorized Nuclear Inspection services. The Authorized Nuclear Inspectors (ANI) inspected in-process and completed work on a sample basis to independently assure compliance to the ASME Code. These inspections were performed on items and processes that were also inspected by T-B QC personnel.

(2) T-B inspectors only performed visual examinations of welds. All other Non-Destructive Examination (NDE) was independently performed by Peabody/GEO Testing. GEO NDE included radiography, liquid penetrant, magnetic particle and ultrasonic testing.

(3) All radiographs were independently reviewed by a qualified Ebasco Examiner.

(4) Independent Preservice Inspection (PSI) of piping, pipe welds, and pipe supports per ASME Section XI requirements was performed by Virginia Corporation under contract to LP&L. This inspection consisted of both visual examination and ultrasonic testing of critical safety related installations previously installed and inspected by T-B personnel.

(5) All safety-related piping systems were hydrostatically tested to assure system integrity. In addition to T-B QC personnel, these tests were witnessed by the T-B ANI (Hartford), Ebasco Start-Up personnel, LP&L Start-Up personnel, and the LP&L ANI (Factory Mutual - witnessed Class 3).

(6) All piping documentation was reviewed by T-B and Ebasco QA personnel. On a sampling basis, LP&L QA personnel reviewed a minimum of 10% of this documentation. The LP&L QA documentation review included field verification of approximately 3% of the installed hardware of small bore piping.

(7) The Pre-Core Hot Functional Test has been performed and this test verified the integrity of the pipe welds under pressure and thermal loading based on simulated actual plant conditions.

(8) Verification of piping configuration was accomplished as part of Ebasco Engineering IE Bulletin 79-14 program. The Pre-Core Hot Functional thermal monitoring program further established the adequacy of the as-built piping configuration to function as designed.

SEISMIC PIPE SUPPORTS

(9) Ebasco Engineering has performed a field verification of Seismic Category I support/restraints which consisted of the following:

a. Support/restraint location and functionality (IE Bulletin 79-14).
b. Completeness of hardware installation

(10) Support/Restraint functionality was verified during the Pre-Core Hot Functional Thermal Monitoring Test program.

(11) As a result of Significant Construction Deficiency No. 60 (NCR 4010), T-B QC inspectors reinspected over 4500 safety-related pipe supports.

(12) Ebasco QA has performed a detailed as-built inspection of over 200 highly stressed hangers.

(13) LP&L QA has inspected 3500 hangers in accordance with procedure QASP 19.7.

(14) LP&L contracted Helmut Thielsch, a noted metallurgist, to independently review the support/restraint assembly structural welds. In his report he concluded that even those welds that were considered marginal in appearance, exceeded load carry requirements by a considerable amount. Further, he judged the structural welds to be comparable to other nuclear power plants.

(15) The LP&L Piping Verification Group is responsible for the following activities to be performed during Phase III testing program:

a. Monitor mechanical snubbers for cold/hot settings

b. Monitor spring hangers (except 2" & under non-seismic/non-safety) for cold/hot settings.

c. To clear the deficiencies found during the pre-core hot functional testing, a portion of safety class (high energy) piping will be monitored for thermal expansion.

(16) All hanger documentation was reviewed by T-B and Ebasco QA personnel. On a sampling basis, LP&L QA personnel reviewed a minimum of 10% of this documentation. The LP&L QA documentation review included a field verification of approximately 3% of the installed hardware.

The above reviews and inspections confirm the overall acceptability of the work performed by Tompkins-Beckwith. Therefore, there is adequate assurance that the safety related piping and supports will satisfactorily perform their intended functions and no further construction-related inspections or tests are warranted.

PIPING

COMPONENT	CODE CLASS	QUANTITY INVOLVED	PRIMARY WELD CONFIGURATION	CODE REQ'D NDE	Tompkins-Beckwith T-B Scope of Work: QC INSPECTION PERFORMED BY T-B	Overinspections, Reinspections and Walkdowns: ASME CODE INSPECTION	NDE	RADIOGRAPH REVIEW	PRESERVICE INSPECTION	HYDROSTATIC TESTS	DOCUMENTATION REVIEW T-B	EBASCO	LP&L	OTHER
Piping Large Bore	ASME III Class 1	50 Isos	Circumferential Welds	VT, RT, MT or LP	1. Dimensional Verification 2. Component & Weld No. Verified 3. Cleanliness 4. Fit-Up 5. Purge (1% O_2) 6. Preheat 7. Interpass 8. Purge Dam Removed 9. Intern. Root Pass Insp. 10. Welder Stamp, Weld & Iso No. 11. Final Visual 12. PWHT Acceptance	(1) Third Party - Hartford Steam Boiler	(2) Independent examination by GEO Testing RT, MT, LP	(3) Ebasco 100%	(4) Independent Inspection by Virginia Corp.	(5) 100% Inspected by: 1) T-B Inspectors 2) T-B ANI-Hartford 3) Ebasco Start-Up 4) LP&L Start-Up	(6) 100%	(6) 100%	(6) 10% (Min.)	(7) Hot Functional Tests (8) IE Bulletin 79-14 Program
	ASME III Class 2	285 Isos	Circumferential Welds	VT RT	Same as above	(1) Same as above	(2) GEO Testing RT	(3) Ebasco 100%	(4) Same as above	(5) Same as above	(6) 100%	(6) 100%	(6) 10% (Min.)	
	ASME III Class 3	472 Isos	Circumferential Welds	VT and MT or LP	Same as above	N. A.	(2) GEO Testing MT, LP	N. A.	N. A.	(5) Same as above (except no T-B ANI)	(6) 100%	(6) 100%	(6) 10% (Min.)	
Piping Small Bore	ASME III Class 1	2 Isos	Circumferential Welds	VT RT	1. Dimensional Verification 2. Component & Weld No. 3. Cleanliness 4. Fit-Up 5. Preheat 6. Interpass 7. Welder Stamp, Weld & Iso No. 8. Final Visual	(1) Same as above	(2) GEO Testing RT	(3) Ebasco 100%	(4) 1" and above Same as above Independent Inspection by Virginia Corp.	(5) Same as above	(6) 100%	(6) 100%	(6) 10% (Min.) 3% Field Verified	(9) 2600 socket welds reinspected under SCD-28 (Sch-160)
	ASME III Class 2	14 Isos	Socket Welds	VT and MT or LP	Same as above	(1) Same as above	(2) GEO Testing MT, LP	N. A.	N. A.	(5) Same as above	(6) 100%	(6) 100%	(6) 10% (Min.) 3% Field Verified	
	ASME III Class 3	47 Isos	Socket Welds	VT	Same as above	N. A.	N. A.	N. A.	N. A.	(5) Same as above (except no T-B ANI)	(6) 100%	(6) 100%	(6) 10% (Min.) 3% Field Verified	
Containment Pene.'s	ASME III Subsec. NC	150 Isos	Circumferential Welds large bore piping ASME III Class 2	VT RT	Essentially same as piping ASME III, Class 2	(1) Third Party - Hartford Steam Boiler	(2) GEO Testing RT	(3) Ebasco 100%	(4) Independent Inspection by Virginia Corp.	(5) Overpressurization Tests	(6) 100%	(6) 100%	(6) 10% (Min.)	

SEISMIC PIPE SUPPORTS

Tompkins-Beckwith Scope of Work

Overinspections, Reinspections, and Walkdowns

COMPONENT	CODE CLASS	QUANTITY INVOLVED	PRIMARY WELD CONFIGURATION	CODE REQ'D NDE	QC INSPECTION PERFORMED	NDE	OTHER INSPECTION(S)/REVIEWS	DOCUMENTATION REVIEW T-B	EBASCO	LP&L	OTHER
					T-B	T-B	(9)	(16)	(16)	(16)	
Seismic Hangers	AWS D1.1 ASME III NF (Chilled Water Only)	6800	Fillet Welding	VT	1. Dimensional Verification 2. Fit-Up and Final of Welds 3. Material Traceability	VT	- Ebasco Engineering Field Verification (10) - Thermal Monitoring Test Program (11) - NCR 4010 Inspections (SCD No. 60) (12) - Ebasco As-built inspections of over 200 Highly Stressed Hangers (QAI No. 20) (13) - LP&L QA Inspection of 3500 hangers (QASP 19.7) (14) - Weld Study by Metallurgist Helmut Thielsch (15) - LP&L Piping Verification Group	100%	100%	10% (Min.) 3% Field Verification	

ATTACHMENT 1

C. WALDINGER

1. On-Site Dates: April 1977 to June 1979

2. Scope of Work:

   a. Install HVAC duct, duct accessories, and supports.
   b. Install HVAC equipment.
   c. Perform pre-operation, balancing, and functional testing of HVAC systems.
   d. Install plant stack.
   e. Install duct insulation.
   f. NDE by others.
   g. Waldinger's contract calls for furnishing and fabrication of ductwork, accessories, and supports; as well as installation.
   h. Includes safety-related and/or seismic and non-safety related/non-seismic.
   i. Leak and pressure testing of HVAC systems performed by Coastal Air Balance (W3-FB-19) with TWC QC witness.

3. Scope of Inspection:

   a. Receiving Inspection.
   b. Inspection of on-site fabrication.
   c. Inspection of installation of drilled-in concrete expansion anchors.
   d. Inspection of duct-duct connections.
   e. Fit-up and final visual inspection of structural welds.
   f. Inspection of equipment setting (including bolt torquing).
   g. Witness leak and pressure tests.

4. QA Program Requirements/Contractual Commitments:

   a. QA Personnel - ANSI N45.2.6 paragraph 3.1 per Waldinger's QA Manual.
   b. QA Auditors - Waldinger Procedure SQCP 18.1-1, "Audit" which is compatible with ANSI N45.2.23.
   c. QC Inspectors - ANSI N45.2.6 and Waldinger Procedure SQCP-2.1-1, "Qualification of Inspection, Examination, and Testing Personnel".

5. Inspector Qualification and Dispositioning of Deficiencies:

   (In Progress)

RESPONSE

ITEM NO.: 6

TITLE: Dispositioning of Nonconformance and Discrepancy Reports

NRC DESCRIPTION OF CONCERN:

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-APO-P47E	Q2-LW3-SI-10F/E
C(W)-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.

DISCUSSION:

LP&L initiated a program, beginning in February 1984, to review Ebasco site Nonconformance Reports (NCRs) to verify the effectiveness of the Waterford 3 deficiency reporting/disposition programs during construction. That program consisted of a review of Ebasco site NCRs closed prior to initiation of the program (approximately 7100). Each Ebasco site NCR was reviewed and independently assessed by LP&L to determine if:

- The disposition addressed the described discrepancy;
- The NCR was reviewed for reportability 10CFR50.55(e) and 10CFR21; and
- The NCR had received the appropriate signatures.

This response discusses and presents summary results of the original review and a significantly expanded program addressing dispositioned NCRs/DRs (voided and administratively closed NCRs are addressed in the response to Issue 13). This program provides adequate confidence that the overall construction deficiency reporting/disposition system was effectively implemented. Corrective action as a result of the expanded review is also discussed. Discussion of the issue is structured along the lines of the major elements of the expanded program as follows:

I. Review of the specific nonconformance reports and deficiency reports identified by the NRC.
II. Review of Ebasco Nonconformance Reports
III. Review of Mercury Nonconformance Reports
IV. Review of Ebasco Deficiency Reports.

Three general conclusions have resulted to date from the original and expanded reviews, as follows:

1. No additional condition was identified in these reviews which, were it to have remained uncorrected, would have affected adversely the safety of operations of Waterford 3.

2. Corrective action required as a result of the reviews involved correction of documentation deficiencies, reinspection or engineering evaluation and only limited hardware rework.

3. Due to the structure of the filing system, systematic review of the Waterford 3 construction deficiency documentation is difficult, but is achievable.

I. Review of the Specific NCRs and DRs identified by the NRC

The Ebasco and Mercury NCRs and the Ebasco DRs identified by the NRC were first reviewed by Ebasco Quality Assurance Engineers. The NCRs and DRs were reviewed for proper disposition, corrective action completion, appropriate documentation, and proper closure. Upon completion of Ebasco's review and required corrective actions, LP&L QA reviewed the NCRs and corrective actions taken by Ebasco, and sampled the Ebasco review of DRs. The review of NRC identified Ebasco and Mercury NCRs and Ebasco DRs was scoped as follows:

A. Ebasco Nonconformance Reports

Thirty Ebasco NCRs are identified by the NRC in this issue. In addition, seven Ebasco NCRs related to this issue are specifically identified in Supplement 7 to the Safety Evaluation Report (SSER)* which was issued on October 1, 1984. Attachment 1 summarizes the results of the review of NRC identified Ebasco NCRs to date.

B. Mercury Nonconformance Reports

Twenty-three Mercury NCRs are identified by the NRC in this issue. An additional fifteen Mercury NCRs related to this issue are specifically identified in the SSER. Attachment 2 summarizes the results of the review of NRC identified Mercury NCRs to date.

C. Ebasco Deficiency Reports

Ten Ebasco DRs are identified by the NRC in this issue. An additional three Ebasco DRs related to this issue are specifically identified in the SSER. Limited documentation deficiencies were identified and corrected, none of which were safety significant.

* NUREG 0787 (SER Supplement 7 - September 1984)

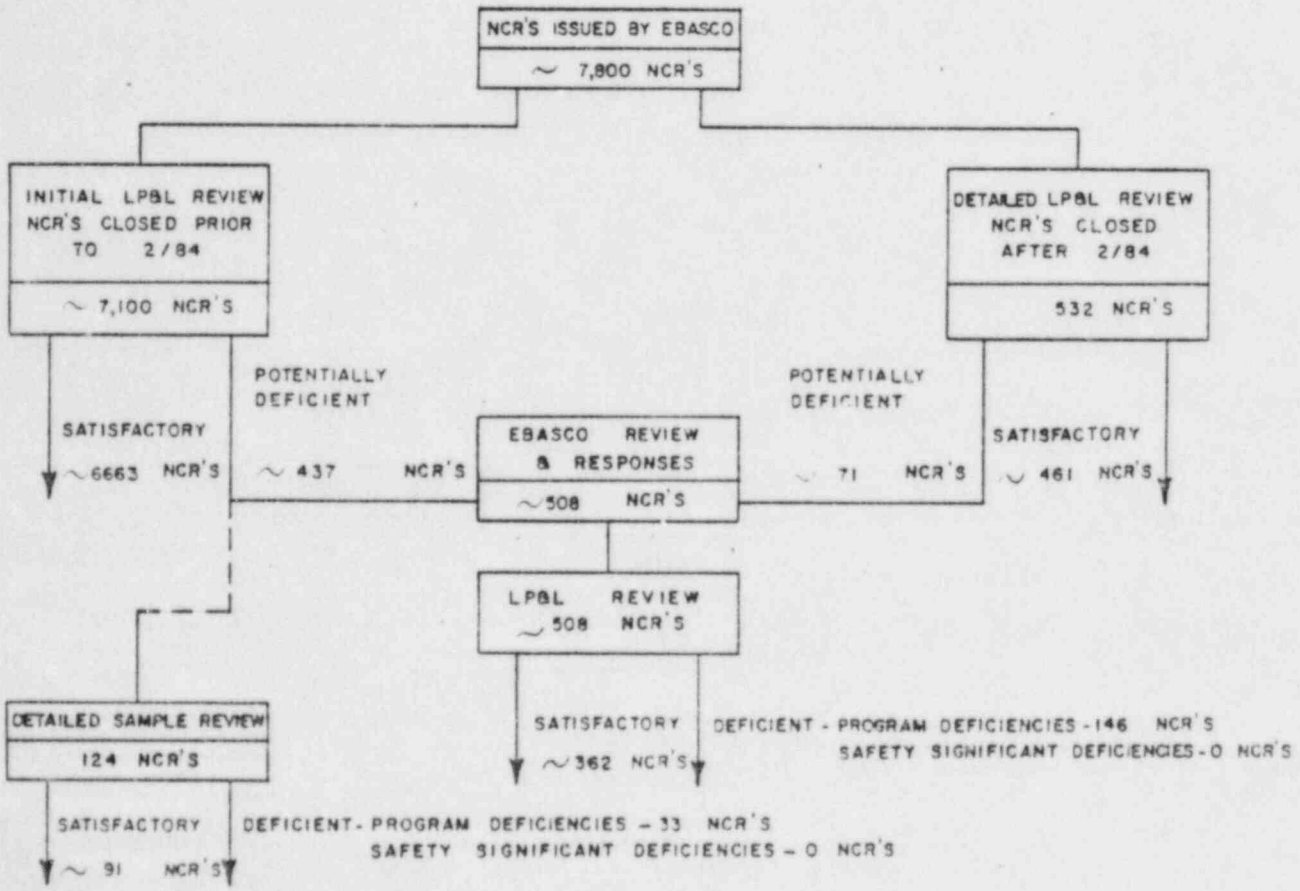
The review for safety significance of the NRC identified documents has been completed. LP&L estimates that the detailed review and closure effort of Ebasco and Mercury NCRs and Ebasco DRs identified by the NRC in this issue as well as those identified in the SSER is approximately 75% complete. LP&L estimates that this review will be completed by November 15, 1984. While QA program procedural deficiencies existed, no safety significant deficiencies have been identified.

II. Review of Ebasco Nonconformance Reports

The review of Ebasco site Nonconformance Reports encompassed approximately 98% of the site NCR numbers issued by Ebasco during the construction of Waterford 3. The review consisted of several elements, each with its own particular level of review. Figure 6-1 depicts the elements of Ebasco NCR review process in the form of a flow diagram, in order to facilitate understanding of the process.

FIGURE 6-1

REVIEW OF EBASCO NCRs



The following paragraphs discuss the individual elements of the review of Ebasco NCRs:

A. LP&L QA Review of Ebasco NCRs closed prior to February 1984

1. Initial Review

In February 1984, LP&L QA initiated a review of Ebasco NCRs. This review was undertaken to verify, by way of a Work Instruction, that:

a. The disposition addressed the described discrepancy;

b. The NCR was reviewed for reportability under 10CFR50.55(e) and 10CFR21; and

c. The NCR had received the appropriate signatures.

Approximately 7100 Ebasco NCRs were reviewed and 437 potentially deficient NCRs were identified. Upon completion of the evaluation, it was determined that 122 NCRs were deficient in disposition, corrective action, software or closure, or combinations thereof. Corrective action required as a result of this review involved only limited hardware rework and correction of documentation deficiencies.

Seventy-two of the NCRs were considered potentially deficient for lack of documented evidence that they had been reviewed for reportability per 10CFR50.55(e) or 10CFR21. Subsequent documented reviews of these NCRs determined that none were reportable.

2. Detailed Review

LP&L selected 124 (approximately 28%) of the potentially deficient NCRs identified in the initial review for an in-depth review. This review included hardware verification for rework/repair, software verification for updating as-built drawings and specifications and evaluation of documentation for the required corrective actions and retrievability of documentation.

As a result of this detailed review, 33 NCRs were found to be deficient, and seven CIWAs were initiated to address the deficiencies. None of these deficiencies met the criterion for safety significance. Corrective action for 30 of the deficient NCRs involved correction of documentation deficiencies, reinspection or engineering evaluation. For the remaining three, limited discretionary rework is being performed.

B. Detailed LP&L QA Review of Ebasco NCRs closed after February 1984

Ebasco NCRs closed after February 1984 were reviewed as a separate group by LP&L QA. Review of these NCRs was in-depth and was for the purpose of verifying proper disposition, adequate documentation to support the required corrective action, required software changes completed and proper closure. Five hundred thirty two (532) NCRs were reviewed with 71 NCRs requiring resolution of comments. Of those 71 NCRs, 24 were determined to have valid deficiencies. Corrective action for 22 of the deficient NCRs involved correction of documentation deficiencies, reinspection or engineering evaluation. For the remaining two, limited discretionary rework is being performed.

C. Ebasco NCR Closure Timeliness

With respect to the NRC concern regarding timeliness of Ebasco NCR closure, Ebasco procedure ASP-III-7, "Processing of Nonconformance", required completion of corrective action within twenty (20) days of receipt of the dispositioned NCR. If the verification of corrective action was not completed within the allotted twenty days, a written request for extension was to be filed with the Ebasco Quality Assurance Department for approval. The twenty day time period did not begin until the nonconformance report had been dispositioned and evaluated by the appropriate departments. The twenty day requirement was for administrative control only and did not adversely affect the quality of Waterford 3. In December, 1983, Ebasco procedure ASP-III-7 was revised to delete this requirement.

All Ebasco NCRs closed as of approximately the end of September, 1984 (Approximately 98% of the Ebasco NCRs issued) were subjected to an LP&L review as described above. While program deficiencies existed, and minor rework was required, no safety significant deficiencies have been identified.

III. Mercury Nonconformance Reports

Mercury dispositioned approximately 3700 Mercury NCRs. Of these, approximately 1700 were upgraded to Ebasco NCRs and, as such, were reviewed as Ebasco NCRs (See Section II of this response). The remaining Mercury NCRs were reviewed as follows:

A. Mercury NCRs dispositioned "Use-As-Is" were reviewed to assure that they were upgraded to Ebasco NCRs, as required. As a result of this review, 31 NCRs were deemed to require upgrading to Ebasco NCRs. The NCRs are now identified on Ebasco NCRs, and were processed under the Ebasco NCR program.

B. Approximately 1850 Mercury NCRs were dispositioned "rework/repair" or "reject." In most cases, when Mercury designated a deficiency to be corrected by "repair", it was, in fact, a "rework." For example, in dispositioning rejected welds, Mercury would specify the weld be "repaired" in accordance with procedures to meet the design requirements. This is actually a "rework" disposition. Mercury procedures did state that deviations from original design or technical specification outside the tolerances allowed was a "repair". Mercury procedures required nonconformances meeting this criteria to be upgraded to Ebasco NCRs so that these deviations would be reviewed and approved by Ebasco.

A random sample of 66 Mercury NCRs from those dispositioned "rework/repair" was selected for review. These NCRs were reviewed for proper disposition, adequate documentation of corrective actions required and proper closure. LP&L QA reviewed each sampled Mercury NCR in accordance with QASP 19.17. Deficiencies were corrected and documented. None were found to be of safety significance.

C. Seven hundred twenty five (725) of the 1850 Mercury NCRs dispositioned "rework/repair" and "reject" were reviewed by Ebasco for reportability per 10CFR50.55(e). None of the NCRs were determined to be reportable. LP&L QA selected a random sample of 64 of these NCRs for a reportability review and the Ebasco conclusions were confirmed.

D. Mercury documented material conditionally released from Ebasco on Material Receiving Reports (MRR) and assigned Mercury NCR numbers to each such MRR in accordance with Mercury Procedure SP664. Approximately 120 Mercury NCRs of this type were identified by Ebasco. LP&L reviewed the Mercury files and, although the conditional releases appeared to have been properly handled, there were instances where supporting information (Ebasco NCRs, DNs) was neither referenced nor included in the documentation package. The supporting information is available and will be either included or referenced, in the NCR packages, as appropriate.

This review of dispositioned Mercury NCRs is essentially complete. While program deficiencies existed, no safety significant deficiencies have been identified. The results of these sample reviews establish a 95% confidence level that at least 95% of the total population of Mercury NCRs do not contain unreported conditions reportable under 10CFR50.55(e) or 10CFR21.

IV. Review of Ebasco Deficiency Reports

The Ebasco QAIRC review of contractors records required that deficiencies be documented on Deficiency Reports in accordance with QAI-9, "Review and Handling of Construction Installation (DRs) Records". A random sample of DRs generated as result of the review of Mercury and Tompkins-Beckwith records was reviewed for proper closure. For each contractor, 230 QAI 9.2 Deficiency Report Sheets were selected and reviewed as follows:

A. The review of Deficiency Reports on Tompkins-Beckwith included 115 Deficiency Report Sheets on piping and one hundred fifteen QAI 9.2 Deficiency Report Sheets on seismic hangers and supports. These QAI 9.2 Deficiency Report Sheets included approximately 856 DRs. This review identified 12 DRs which required engineering evaluation and concurrence. Although minor deficiencies, such as missing references, signatures or dates were identified, the DR closures were satisfactory.

B. The review of the 230 Mercury QAI 9.2 Deficiency Report Sheets was divided equally among P-2 and P-3 tubing, and tube track supports. These QAI 9.2 Deficiency Report Sheets included approximately 1173 DRs. The review identified 31 DRs which required engineering evaluation. The engineering evaluations are in progress. Although minor deficiencies, such as missing references, signatures or dates were identified, the DR closures were satisfactory.

LP&L QA performed audits of the Ebasco review. These audits included random samples of the Mercury and Tompkins-Beckwith DRs reviewed by Ebasco. While documentation deficiencies existed, no safety significant deficiencies, or deficiencies requiring rework, have been identified.

CAUSE

The review program verified that deficiencies were generally processed in accordance with the site procedures. However, those procedures did not provide adequately specific guidelines for the implementation of procedural requirements which led to excessive need for judgements and interpretations. This program weakness led to the inconsistencies in handling deficiencies at Waterford 3 which have been identified by LP&L and the NRC.

GENERIC IMPLICATIONS

The review program encompassed approximately 98% of the Ebasco NCRs and statistically justified samples of Mercury NCRs and Ebasco DRs. The results of an in-depth review and verification of a conservative sample of NCRs and DRs has provided adequate confidence that the deficiency system did not allow conditions in dispositioned NCRs/DRs to remain unreported per 10CFR50.55(e) and 10CFR21.

SAFETY SIGNIFICANCE

LP&L has performed a review of major elements of the construction deficiency reporting/disposition system. The results of this review indicate that, in general, the system was effectively implemented. The procedures contained the basic requirements for documenting and controlling deficient conditions. The deficiencies identified during the review of nonconformances are considered minor in nature and were generally resolved with the addition of documentation or further evaluation. The items dispositioned as rework were based on good engineering practice or management conservatism rather than on safety significance. There is no recognized reason that this issue should constrain fuel load or power operation.

CORRECTIVE ACTION PLAN/SCHEDULE

The remaining reviews and corrective actions are expected to be completed prior to November 15, 1984.

ATTACHMENTS

1. Ebasco Nonconformance Reports Identified by the NRC.

2. Mercury Nonconformance Reports Identified by the NRC.

REFERENCES

None.

ATTACHMENT 1

EBASCO NONCONFORMANCE REPORTS IDENTIFIED BY THE NRC

The following is a list of EBASCO Nonconformance Reports (NCRs) identified by the NRC in Issue No. 6 and in Supplement 7 to the Safety Evaluation Report (SSER). The list identifies the NRC Concerns with each NCR and the Resolution or Corrective Action taken to date. The list also summarizes any additional concerns identified as a result of the LP&L Review and the Resolution or Corrective Action taken to date. It should be noted that dispositioned NCRs were reviewed for reportability under 10CFR50.55(e) and 10CFR21 and none were found to be reportable.

NOTE: This is an incremental submittal. Resolution to those NCRs identified by the NRC in Issue Number 6 but for which there is no explanation herein are under final review by LP&L. It is planned to have those reviews completed by November 10, 1984.

A. Ebasco NCRs Identified in Issue No. 6

1. NCR W3-1650

2. NCR W3-3912

3. NCR W3-3919

4. NCR W3-4088 (Mercury 491)

(a) NRC CONCERNS

There was no description attached to the NCR to verify that corrective action was accomplished or completed.

RESOLUTION OR CORRECTIVE ACTION

1. Found and attached a copy of LP&L CIWA 828372, which was issued to perform the corrective action for NCR-W3-4088,
2. Found and attached a Mercury QC report which verifies adequate completion of corrective action.
3. Found and attached a Mercury weld data report for the replacement welds.
4. Found and attached a copy of drawing 100-T-035-A, which reflects the replacement welds described in #3 above.

(b) LP&L IDENTIFIED CONCERNS

1. Inadequate "use-as-is" justification provided by engineering, for discrepant items B, C, & G on NCR attachment #1.
2. Drawing 100-T-035-A showing the affected instrument line was not attached to the NCR.
3. Supporting weld data documentation was not attached to the NCR.

4. NCR W3-4088 (Mercury 491) (Continued)

RESOLUTION OR CORRECTIVE ACTION

1. Obtained and attached additional ESSE evaluations to the NCR.
2. Obtained and attached copy of drawing 100-T-035A to the NCR.
3. Obtained and attached a copy of Mercury's weld data report for the replacement welds.

5. NCR W3-4137 (Mercury #420)

(a) NRC CONCERNS

1. Improper NCR closure and reopening.
2. Incorrect reporting system (DN in lieu of NCR).

RESOLUTION OR CORRECTIVE ACTION

1. NCR-W3-4137 was reopened and processed in accordance with applicable procedures.

(b) LP&L IDENTIFIED CONCERNS

1. NCR corrective action did not adequately correct the discrepancies.
2. DN-SQ-1991 was not properly processed in accordance with the applicable procedures.

RESOLUTION OR CORRECTIVE ACTION

1. Deficiency was reinspected. ESSE evaluated the condition accept-as-is.
2. Drawing was revised.
3. Corrective action for violation of Procedure WQC-150(DN in lieu of NCR) cannot be accomplished since subject procedure has been retired.

6. NCR W3-4219

7. NCR W3-5563

(a) NRC CONCERNS

1. Inspections signed off by an unqualified inspector.
2. Inspection Reports co-signed by Level II inspector 3 years and 5 months later.

RESOLUTION OR CORRECTIVE ACTIONS

NCR reopened and CIWA written to re-inspect Fuel Handling Building (FHB) Crane.

7. NCR W3-5563 (Continued)

(b) LP&L IDENTIFIED CONCERNS

Same as above.

RESOLUTION OR CORRECTIVE ACTION

Same as above.

8. NCR W3-5564

(a) NRC CONCERNS

Disposition of NCR for inspection through paint is unacceptable, due to paint precludes adequate visual inspection of the welds.

RESOLUTION OR CORRECTIVE ACTION

Downgrading of FHB stairways from Seismic Class I to Seismic Class II eliminates the requirements for visual inspection.

(b) LP&L IDENTIFIED CONCERNS

1. No QC verification signature on the sketches provided in attachment #23 of the NCR.
2. Insufficient ESSE evaluation for downgrading Seismic Class I stairs in the FHB, to Seismic Class II.

RESOLUTION OR CORRECTIVE ACTION

1. Ebasco QC performed and documented a verification of the items identified in the stairwell on NCR attachment #23, and attached the results to the NCR as attachment #24.
2. ESSE Electrical and HVAC reviewed the information in NCR attachments #23 and #24, and determined them to be non-safety.

9. NCR W3-5565

(a) NRC CONCERNS

1. The qualification of the QC inspector who performed the inspection of reviewing of the FHB Crane.
2. The documentation of the reinspection was not attached to the NCR as directed by the NCR.

RESOLUTION OR CORRECTIVE ACTION

1. The FHB crane was turned over to LP&L with subsequent testing and reinspection performed by LP&L on 1/29/83 per their procedure SPO-40-002.
2. The testing and inspection data performed by LP&L has been attached to the NCR.

9. NCR W3-5565 (Continued)

(b) LP&L IDENTIFIED CONCERNS

Nonconformance was reopened on April 26, 1984 to add attachment 1A and closed the same day without documented evidence that the investigation as required in the attachment was actually performed.

RESOLUTION OR CORRECTIVE ACTION

Attachment 5 has been added to the NCR to reference LP&L test procedure SPO-40-002 which documented the final functional testing of the subject crane.

10. NCR W3-5586

11. NCR W3-6159

12. NCR W3-6165

(a) NRC CONCERNS

1. There is no indication of measures taken to preclude recurrence.

RESOLUTION OR CORRECTIVE ACTION

1. A review of Filler Metal Requisitions and T&B time sheets indicates that welder R-7 not R-1 made the weld concerned, and R-1 was not employed during the time the weld was made, therefore, measures taken to preclude recurrence were not necessary.

(b) LP&L IDENTIFIED CONCERNS

1. Documented verification that welder R-1 was not on site should be included.

RESOLUTION OR CORRECTIVE ACTION

1. Review attached to NCR indicating R-1 not on site during the time period weld was made.

13. NCR W3-6221

(a) NRC CONCERNS

1. Weld control records signed off by Level I Inspector.
2. Letter of designation based on revision of Q.A. Manual not if effect at the time of letter issuance.

RESOLUTION OR CORRECTIVE ACTION

1. LP&L QA evaluated inspectors experience, education, and training and determined the inspector was qualified to perform the designated activities.

(b) LP&L IDENTIFIED CONCERNS

Same as above.

RESOLUTION OR CORRECTIVE ACTION

Same as above.

14. NCR W3-6511

(a) NRC CONCERNS

1. The NCR only addressed the fact that the maximum gap was violated, should have included undersize weld; lack of fusion; arc strikes and undercut.
2. There are no records of rework or reinspection.

RESOLUTION OR CORRECTIVE ACTION

1. Support was reinspected by Ebasco QC and as-built data supplied to ESSE.
2. ESSE accepted support "as-is."
3. Documentation posted to Mercury installation package to assure update to as-built installation documentation.

(b) LP&L IDENTIFIED CONCERNS

Same as above.

RESOLUTION OR CORRECTIVE ACTION

Same as above.

15. NCR W3-6597 (Mercury #2870)

16. NCR W3-6623

17. NCR W3-6723

18. NCR W3-6786

19. NCR W3-7099

(a) NRC CONCERNS

1. No documentation to adequately support the NCR Disposition.

RESOLUTION OR CORRECTIVE ACTION

1. Stress calculations utilized as a basis for disposition have been attached to the NCR.

(b) LP&L IDENTIFIED CONCERNS

1. Cracks in heat affected zone of cabinets 48A & B.
2. Smaller than design embed plates.
3. Flare bevel in lieu of fillet welds.

RESOLUTION OR CORRECTIVE ACTION

1. Cracks accepted by ESSE.
2. Embed plates are the correct size; cabinet 48A requires a split 4"x4"x3/8 TS (which leaves 3" wide exposure) and cabinet 48B required a 4" wide plate.
3. Flare bevels, fillets and lengths accepted by ESSE.

20. NCR W3-7139

(a) NRC CONCERNS

QC data in NCR was incorrect for 2 of 3 radiation monitors.

RESOLUTION OR CORRECTIVE ACTION

NCR re-opened and letter of clarification and inspection report added to NCR.

(b) LP&L IDENTIFIED CONCERNS

F&M Inspection Report IR303-71-624 contains only sheet 1 of 3 and does not include a list of the discrepant supports.

RESOLUTION OR CORRECTIVE ACTION

Sheets 2 and 3 of Inspection Report added.

21. NCR W3-7140

(a) NRC CONCERNS

None were listed in the allegations associated with this issue in Supplement 7 to the Safety Evaluation Report (SSER).

(b) LP&L IDENTIFIED CONCERNS

1. Traceability of rework materials.

RESOLUTION OR CORRECTIVE ACTION

1. Rework consisted of additional welding only, filler metal requisition form enclosed in documentation of NCR.

22. NCR W3-7177

23. NCR W3-7179

(a) NRC CONCERN

None were identified in the allegations associated with this issue in Supplement 7 to the Safety Evaluation Report (SSER). None were identified in the LP&L review.

24. NCR W3-7180

(a) NRC CONCERNS

F&M procedure QC-309 violated ANSI N45.2 Section 13, because it did not require the tension tester serial #, pressure gage # or calibration date to be recorded.

RESOLUTION OR CORRECTIVE ACTION

ANSI N45.2, Section 13 does not require the recording of serial numbers or calibration dates on test reports. However, during the time frame involved there were only two (2) pressure gauges that were utilized sitewide (QC 4.2.1 & QC 4.2.2). These gauges were maintained under Ebasco's M&TE procedure WQC-4. Copies of the calibration records are attached to NCR-W3-7184.

25. NCR W3-7181

(a) NRC CONCERNS

F&M procedure QC-309 violated ANSI N45.2 Section 13, because it did not require the tension tester serial number, pressure gage # or calibration date to be recorded.

25. NCR W3-7181 (Continued)

RESOLUTION OR CORRECTIVE ACTION

ANSI N45.2, Section 13 does not require the recording of serial #'s or calibration dates on test reports. However, during the time frame involved there were only two (2) pressure gauges that were utilized sitewide (QC 4.2.1 & QC 4.2.2). These gauges were maintained under Ebasco's M&TE procedure WQC-4. Copies of the calibration records are attached to NCR-W3-7184.

26. NCR W3-7182

27. NCR W3-7184

28. NCR W3-7432

(a) NRC CONCERNS

1. Concrete pre-placement & post-placement documentation could not be matched.
2. No specific references were used for voiding the NCR.
3. QA Engineer approved the Recommended Disposition and then voided the NCR.

RESOLUTION OR CORRECTIVE ACTION

1. NCR-W3-7431 R1 addressed curing violations. NCR-W3-7435 addressed the placement documentation.
2. Late entry added to NCR-W3-7432 referencing NCRs W3 7431 R1 & W3-7435.
3. Not a procedural violation per ASP-III-7, Rev. 5. The recommended disposition was approved 11/23/83; NCR was voided 1/16/84.

29. NCR W3-7533

30. NCR W3-7547

B. Ebasco NCRs Identified in Supplement 7 to the SSER

The following Ebasco NCRs were identified by the NRC in Supplement 7 to the Safety Evaluation Report published October 1, 1984. The review of these NCRs is scheduled to be completed by November 15, 1984.

W3-6514	W3-5974	W3-5973
W3-3941	W3-4593	W3-6719
W3-5819		

ATTACHMENT 2

MERCURY NONCONFORMANCE REPORTS IDENTIFIED BY THE NRC

The following is a list of Mercury Nonconformance Reports (NCRs) identified by the NRC in Issue No. 6 and in Supplement 7 to the Safety Evaluation Report (SSER). The list identifies the NRC concerns with each NCR and the Resolution or Corrective Action taken to date. The list also summarizes any additional concerns identified as a result of the LP&L Review and the Resolution or Corrective Action to date. It should be noted that dispositioned Mercury NCRs were reviewed for reportability under 10CFR50.55(e) and 10CFR21 and none were found to be reportable.

NOTE: This is an incremental submittal. Resolution to those NCRs identified by the NRC in Issue Number 6 but for which there is no explanation herein are under final review by LP&L. It is planned to have those reviews completed by November 10, 1984.

A. Mercury NCRs Identified in Issue No. 6

1. NCR-180 (Ebasco NCR W3-6839)

2. NCR-255

(a) NRC CONCERNS

None were identified in the allegations associated with this issue in Supplement 7 to the Safety Evaluation Report (SSER).

(b) LP&L IDENTIFIED CONCERNS

The documentation of the corrective action was not available for eight of the fourteen supports requiring retorque.

RESOLUTION OR CORRECTIVE ACTION

The supports identified as having misplaced documentation were reinspected. This action has been completed with acceptable results and attached within the NCR package.

3. Mercury NCR-268

(a) NRC CONCERNS

None were listed in the allegations associated with this issue in Supplement 7 to the Safety Evaluation Report (SSER).

3. Mercury NCR-268 (Continued)

(b) LP&L IDENTIFIED CONCERNS

1. This NCR is not a rework as stated, it is a "use-as-is" since as-built information is to be redlined.
2. Should have been up-graded to an Ebasco NCR.
3. No objective evidence Ebasco Engineering has approved the as-built conditions.
4. All deficiencies identified in the description are not addressed in the disposition completed section of the NCR.
5. There is not objective evidence to indicate that all existing field conditions have been incorporated into the redline drawing.
6. NCR was written 1/26/82 and closed 12/22/82. Training records supplied for corrective action are dated 11/29/82 (due to updated revision of five procedures released this date) and 6/17/84 (due to Ebasco audit) there is no evidence of timely retraining of personnel per disposition of NCR.

RESOLUTION OR CORRECTIVE ACTION

1. The NCR represents a procedural violation for failure to redline the drawing prior to the installation of the supports. There was no physical rework due to the actual installation being acceptable. This NCR was written as an in-process deficiency due to the inspector's findings during walkdown inspection.
2. The NCR was not used to accept a deviation from design requirements, thus, did not require upgrading to an Ebasco NCR.
3. As-built conditions were in accordance with Ebasco guidelines provided to Mercury in the specifications and drawings.
4. The deficiencies identified were addressed by redlining the drawing and requiring the training to address the procedural violation.
5. Copy of the drawing is attached.
6. No specific training records could be located for this NCR. However, as a result of SCD #57, all Mercury personnel were retrained. This training addressed redlining.

4. NCR-363

(a) NRC CONCERNS

An Authorized Nuclear Inspector (ANI) review was not performed for installation of strongback support lugs to ASME process pipe.

RESOLUTION OR CORRECTIVE ACTION

ASME process pipe is class 3 and does not require ANI review.

4. NCR-363

(b) LP&L IDENTIFIED CONCERNS

1. Mercury NCR should have been upgraded to an Ebasco NCR.
2. Mercury Project Engineer did not verify similar installation for like conditions.

RESOLUTION OR CORRECTIVE ACTION

1. ESSE approved the existing condition by issuance of an DCN.
2. Ebasco QA reviewed similar installations and the review results were placed with the Mercury NCR File.

5. NCR-380 (Ebasco NCR-W3-4015)

(a) NRC CONCERNS

None were identified in the allegations associated with this issue in Supplement 7 to the Safety Evaluation Report (SSER).

(b) LP&L IDENTIFIED CONCERNS

1. Three sets of weld data records for support 604-70 are attached to the NCR. Unable to determine which record is being used as a basis for acceptability.
2. Mercury documentation cannot be found for welding performed by welder M-229.

RESOLUTION OR CORRECTIVE ACTION

1. NCR-W3-4015 was revised to NCR-W3-4015 R1 for clarification of this discrepancy.
2. Research by Ebasco revealed that welder M-229 was qualified to perform the welding on the anchor plates.

6. NCR-420 (Ebasco NCR W3-4137)

7. NCR-429 (Ebasco NCR W3-3965)

(a) NRC CONCERNS

None were identified in the allegations associated with this issue in Supplement 7 to the Safety Evaluation Report (SSER). None were identified in the LP&L review.

8. NCR-438 (Ebasco NCR W3-4013)

9. NCR-487 (Ebasco NCR W3-4044)

10. NCR-491 (Ebasco NCR W3-4088)

11. MERCURY NCR-528 (Ebasco NCR W3-4824)

(a) NRC CONCERNS

None were identified in the allegations associated with this issue in Supplement 7 to the Safety Evaluation Report (SSER).

(b) LP&L IDENTIFIED CONCERNS

1. No statement or documentation was attached to the NCR to resolve traceability of heat #M2245.
2. Disposition of NCR fails to state whether the correct ID# was etched on the plate.
3. No documentation was attached to the NCR to verify corrective action take .

RESOLUTION OR CORRECTIVE ACTION

1&3 Attached a copy of MRR-77-11206 to NCR, indicating heat code MZ-245 (M2245), and associated supplier C of C.

2. Field verified heat number 7428779 on anchor plate.

12. NCR-540

(a) NRC CONCERNS

None were identified in the allegations asscciated with this issue in Supplement 7 to the Safety Evaluation Report (SSER).

(b) LP&L IDENTIFIED CONCERNS

1. Documentation not attached to NCR for replacement of support locator #31.
2. Documentation not attached to NCR for replacement of tubing that had cold spring.

RESOLUTION OR CORRECTIVE ACTION

1. Mercury documentation was attached to NCR for replacement of support locator #31 with an acceptable support locator #33.
2. Mercury documentation was attached to NCR for replacement of tubing with cold spring.

13. NCR-554

(a) NRC CONCERNS

No documented evidence of corrective action for hanger deficiencies identified during walkdown.

13. NCR-554 (Continued)

RESOLUTION OR CORRECTIVE ACTION

Documentation search and re-inspection established rework was accomplished.

(b) LP&L IDENTIFIED CONCERNS

1. No welding documentation for repair of supports.
2. No inspection documentation for repair of supports.
3. Inadequate documentation of corrective action to correct elongated holes in tube track.

RESOLUTION OR CORRECTIVE ACTION

1 and 2. Documentation search and reinspection established rework was accomplished.

3. Reinspection established rework was accomplished.

14. NCR-560 (Ebasco NCR W3-5428)

15. NCR-565 (Ebasco NCR W3-4730)

See Mercury NCR W3-568.

16. NCR-W3-568 (Ebasco NCR-W3-4730)

17. NCR-W3-591 (Ebasco NCR-W3-4206)

(a) NRC CONCERNS

None were identified in the allegations associated with this issue in Supplement 7 to the Safety Evaluation Report (SSER).

(b) LP&L IDENTIFIED CONCERNS

1. The analysis conducted for this NCR was not attached, including ESSE concurrence.

RESOLUTION OR CORRECTIVE ACTION

1. Calculations were performed by ESSE to substantiate analysis described in NCR. Analysis was attached to the NCR.

18. NCR-W3-594 (Ebasco NCR-W3-5557)

(a) NRC CONCERNS

None were identified in the allegations associated with this issue in Supplement 7 to the Safety Evaluation Report (SSER).

(b) LP&L IDENTIFIED CONCERNS

No documentation that drawing has been redlined.

RESOLUTION OR CORRECTIVE ACTION

Support in question is a typical detail and therefore not red lined. Deviation is referenced appropriately in OCR package.

19. NCR-W3-595 (Ebasco NCR-W3-4197)

(a) NRC CONCERNS

None were identified in the allegations associated with this issue in Supplement 7 to the Safety Evaluation Report (SSER).

(b) LP&L IDENTIFIED CONCERNS

1. Several supports installed which are not per an approved installation detail.

RESOLUTION OR CORRECTIVE ACTION

1. Description of NCR incorrectly written as locator "5" was actually installed as locator "23".
2. The anchor plate installation for locator "23" is acceptable per the general notes section of the B-430 series detail drawings.
3. Attachments to NCR were made to clarify installation details.

20. NCR-614 (Ebasco NCR W3-4219)

21. NCR W3-625 (Ebasco NCR-W3-5282)

(a) NRC CONCERNS

None were identified in the allegations associated with this issue in Supplement 7 to the Safety Evaluation Report (SSER).

21. NCR W3-625 (Ebasco NCR-W3-5282

(b) LP&L IDENTIFIED CONCERNS

1. One weld sign-off for two welds.
2. Reason for voiding installation and location information.

RESOLUTION OR CORRECTIVE ACTION

1. Inspection reports identify welder of both joints.
2. Information voided due to redline #6.

22. NCR-W3-656 (Ebasco NCR-W3-4303)

23. MERCURY NCR-658

(a) NRC CONCERNS

No documentation was attached to the NCR as objective evidence for corrective action taken.

RESOLUTION OR CORRECTIVE ACTION

1. A field verification by EBASCO revealed that corrective action per the NCR disposition had been properly performed.
2. Found and attached to the NCR, a Mercury anchor inspection report for retorquing of Hilti bolts.

(b) LP&L IDENTIFIED CONCERNS

No documentation was attached to the NCR as objective evidence for corrective action taken.

RESOLUTION OR CORRECTIVE ACTION

1. Ebasco field verification revealed that corrective action per the NCR recommended disposition had been properly performed (see Ebasco General Inspection report SW-913).
2. Found and attached to the NCR, a Mercury anchor inspection report for retorquing of Hilti bolts.

B. Mercury NCRs Identified in Supplement 7 to the SSER

The following Mercury NCRs were identified by the NRC in Supplement 7 to the Safety Evaluation Report (SSER) published October 1, 1984. The review of these NCRs is scheduled to be completed by November 15, 1984.

NCR-313	NCR-674	NCR-888
NCR-322	NCR-675	NCR-889
NCR-337	NCR-676	NCR-2234
NCR-572	NCR-677	NCR-3149
NCR-673	NCR-678	NCR-1830/806

Mercury NCRs 888 and 889 were determined to have been administratively closed and accordingly are addressed in the response to Issue 13.

RESPONSE

ITEM NO.: 10

TITLE: Inspector Qualification (J.A. Jones and Fegles)

NRC DESCRIPTION OF CONCERN:

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 indeterminant.

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.

DISCUSSION:

A verification program was implemented to review the professional credentials of 100% of the site QA/QC personnel who may have performed safety-related functions at Waterford 3, including supervisors, managers and remaining QA/QC personnel. The responses to Issues No. 1 and 20 discuss inspector qualifications for Waterford 3 contractors other than J.A. Jones and Fegles.

The program, which is being performed under the overall direction of LP&L, consists of three major elements:

- Collection and verification of personnel data.
- Evaluation of qualifications against specified standards.
- Dispositioning of deficiencies resulting from cases where inspections and tests were conducted by personnel whose qualifications against the appropriate standards could not be confirmed.

Collection and Verification of Personnel Data

Personnel data were collected from various sources, including site files, contractor home office files, personal contact with individuals or supervisors and through a background verification program.

Efforts were made to verify the education and work experience of 100% of the J.A. Jones and Fegles QA/QC personnel by researching Waterford 3 contractor records and by contacting schools, former employers and others. The background verification effort for J.A. Jones and Fegles personnel was a joint LP&L/Ebasco effort. While the success rate of this effort was good, there were cases where confirmatory information was not obtainable. In such cases, the judgement of the LP&L Review Board, as described below, was used to rule on the reliability of the available information.

Evaluation of Qualifications to Specified Standards

QA/QC personnel data were evaluated in order to classify individuals as either having verified qualifications or not. Training, education and work experience were the qualifications of primary concern. These qualifications were verified against the following criteria:

(1) Inspectors - ANSI N45.2.6-1973

(2) Other QA/QC Personnel - QA Program requirements

Initial qualification determinations for J.A. Jones and Fegles QA/QC personnel were performed first by Ebasco and then separately by an LP&L review group. In order to control the consistency of these determinations, approved procedures were utilized. Determinations related primarily to balancing education, experience and training factors.

The LP&L review group qualification determinations were rendered in two categories: "qualified" and "potentially not qualified". "Potentially not qualified" determinations were referred to an LP&L Review Board comprised of senior LP&L QA personnel. The Review Board determinations were further reviewed by a contracted individual very familiar with inspector qualification and related standards. This process resulted in a final determination for all QA/QC personnel as either "qualified", or "unqualified".

The qualification review process is described in QASP 19.12 and QAI-32. The following points further clarify the process:

1. The meaning of the term "unqualified" must be amplified. In some cases determinations were made that, based on verified data, individuals' backgrounds did not warrant qualification to ANSI N45.2.6-1973. In other cases, however, individuals were considered "unqualified" as an expedient in reaching resolution to the concern. This occurred in cases in which:

a. Research of records, inquiries to past employers and employees, contact with schools and verification of training received was either not possible or could not be concluded in a reasonable period of time.

b. Apparent discrepancies existed between background information provided by some individuals and that obtained in the verification process, and resolution could not be achieved on a timely basis. Minor discrepancies were excused; however, significant discrepancies generally rendered any other significant but unverified data as suspect.

2. In the process used, being judged as "unqualified" to ANSI N45.2.6-1973 did not automatically render the individual's work as invalid. For example, an individual may not have the education and experience qualifications for all inspection work, yet be fully competent through specific training or other means to perform the particular tasks assigned to him, which might have been very simple and repetitive in nature. Such an individual potentially satisfies ANSI requirements, which ultimately require that an individual's qualifications be sufficient to provide reasonable assurance that the individual can competently perform a particular task. Whether or not the individual is technically qualified, the individual's work can be deemed valid.

3. During the construction period, some contractors made undocumented judgements with respect to the need for eye examinations for inspection personnel. Such judgements were based on the level of visual acuity or color perception required to achieve competent inspections. Such judgements were also made as part of the verification program and disposition process and will be documented. It is noted that such judgements are specifically suggested in ANSI N45.2.6-1978. This factor was not deemed disqualifying.

Disposition of Deficiencies

For J.A. Jones and Fegles, the LP&L Review Board compiled a list of "unqualified" inspector personnel, and Corrective Action Requests (CAR) were written to formally track and disposition potential deficiencies. Limited background verification efforts remain for J. A. Jones and Fegles personnel. Should completion of the verification cause a change in the results, the response will be amended accordingly.

Included in Attachment 1 are the verification program results for J.A. Jones and Fegles.

For J.A. Jones, CAR EQA84-22 identified 25 QC personnel who performed inspections while not meeting the requirements of ANSI N45.2.6-1973. The construction activities inspected by the identified J.A. Jones personnel with respect to the Common Foundation Basemat and Engineered Backfill were inspected by qualified Ebasco inspectors. Accordingly, inspection by the J.A. Jones personnel does not render the quality of the inspected construction activities as indeterminate. Adequacy of the inspected construction activities was independently confirmed by qualified inspectors. J.A. Jones inspector qualification deficiencies in areas other than the Common Foundation Basemat and Engineered Backfill will be addressed in a supplemental response.

For Fegles, CAR EQA84-20 identified three QC personnel who performed inspections while not meeting the requirements of ANSI N45.2.6-1973. The three individuals performed preplacement inspections on a limited scope of slip form operations. Duplicate preplacement inspections were performed by qualified Ebasco QC inspectors. Accordingly, inspection by the Fegles personnel does not render the quality of the inspected construction activities as indeterminate. Adequacy of the inspected construction activities was independently confirmed by qualified inspectors.

CAUSE:

ANSI N45.2.6-1973 allows substitution for education and experience levels by noting that "... education and experience requirements specified for the various levels should not be treated as absolute when other factors provide reasonable assurance that a person can competently perform a particular task." J.A. Jones and Fegles, to varying degrees, employed such substitutions in certifying the qualifications of their QA/QC personnel. However, the verification program revealed that verification of background data was not adequate or documented, documentation of the justification for substitution was sometimes not provided or lacked depth, and/or was not always totally in accord with J.A. Jones/Fegles procedures or the ANSI standards, as currently interpreted.

GENERIC IMPLICATIONS:

This issue has been treated generically. In response to this Issue and Issues 1 and 20, the verification program included 100% of the QA/QC personnel of all site contractors who performed safety related work.

With regard to future work, qualification and certification of inspectors (including NDE personnel) will be administered through strict compliance with LP&L Nuclear Operations Procedures which meet the requirements of Regulatory Guide 1.58 Rev. 1 (ANSI N45.2.6-1978) and SNT-TC-1A-1975, as applicable.

SAFETY SIGNIFICANCE:

Satisfactory disposition of CAR #EQA84-16 (J.A. Jones) and CAR #EQA84-7 (Fegles) will provide adequate assurance that the installations by J.A. Jones and Fegles will perform satisfactorily in service.

CORRECTIVE ACTION PLAN/SCHEDULE:

Corrective actions required to disposition CAR EQA84-22 (J.A. Jones) are in progress. The CAR EQA84-20 (Fegles) corrective action has been satisfactorily completed as described in Attachment 1. To date, no items of safety significance have been identified. It is currently anticipated that the dispositions of QA/QC personnel qualification issues will be completed by November 21,1984.

ATTACHMENTS:

1. Results of Verification Program for J.A. Jones and Fegles.

REFERENCES:

1. QASP 19.12, Review of Contractor QA/QC Personnel Qualification Verification

2. QAI-32, Instructions for Verification of QA/QC Personnel Qualifications

ATTACHMENT 1

A. J.A. JONES

1. On-Site Dates: October 1975 to March 1981

2. Scope of Work:

   a. Concrete Construction
   b. Concrete Masonry
   c. Concrete Reinforcing Steel
   d. Dewatering and Excavation
   e. Waterproofing
   f. Waterstops
   g. Mechanical Splicing of Reinforcing Steel
   h. Filter and Backfill
   i. Structural Steel

3. Scope of Inspections:

   a. Material Receiving Inspection
   b. Site Fabrication Assembly & Installation Inspections
   c. Structural Inspections
   d. Civil Inspections

4. QA Program Requirements/Contractual Commitment:

   a. QA/QC Personnel, except Auditors, ANSI N45.2.6 and Manual TR-1, "Training/Certification Program", Procedure POP-N-505, "Qualification/Certification of Personnel" and Procedure POP-N-702, "Personnel Training/Qualification/Certification".

   b. Q.A. Auditors - ANSI N-45.2.23 and Manual TR-1, "Training/Certification Program", and Procedure POP-N-505, "Qualification/Certification of Personnel" and Procedure POP-N-702, "Personnel Training/Qualification/Certification".

5. Inspector Qualification and Dispositioning of Deficiencies:

   The Verification Program identified 25 J.A. Jones personnel who performed inspections and whose qualifications were determined as not meeting the requirements of ANSI N45.2.6-1973. Corrective Action Request EQA84-22 was initiated to track the disposition of this deficiency.

A review of the work of the identified J.A. Jones inspectors has been completed with respect to the Common Foundation Basemat, including cadwelds. This review also included the identification of overinspection performed by qualified Ebasco inspectors who inspected the construction of the Common Foundation Basemat.

Where an inspection activity was performed by an identified J.A. Jones inspector, the qualifications of the Ebasco inspector who performed the overinspection of the same activity was checked. In this manner it was demonstrated that each of the Common Foundation Basemat placements were inspected by one or more qualified inspectors.

The reinforcing bar cadwelds which were inspected by J.A. Jones have also been addressed in the response to NRC Concern No. 11 for the entire NPIS. The cadwelds are deemed acceptable.

The structural backfill inspections performed by J.A. Jones were overinspected by qualified Ebasco inspectors. In addition, statistical studies were performed which demonstrate the consistency of the work.

The clam shell Filter Blanket quality was addressed in NCR-W3-5997 including addressing the uncertified J.A. Jones inspectors. The Blanket was found acceptable.

Accordingly, inspection by the J.A. Jones personnel does not render the quality of the inspected construction activities as indeterminate. Adequacy of the inspected construction activities was independently confirmed by qualified inspectors. J.A. Jones inspector qualification deficiencies in areas other than the Common Foundation Basemat and Engineered Backfill will be addressed in a supplemental response.

Completion of the review of the work of the concrete inspectors on the balance of the J.A. Jones construction activities is expected by November 9. This report will be supplemented at that time to reflect the findings of that review.

ATTACHMENT 1

B. FEGLES

1. On-Site Dates: December 1975 to August 1976 (Shield Wall)
   February 1979 to February 1980 (Dome)

2. Scope of Work:

   a. Designing, furnishing, fabricating, erecting and dismantling slip forms for shield wall construction and conventional formwork and supports for dome construction.
   b. Handling, placing and fastening reinforcing steel.
   c. Detail reinforcing steel for shield wall slip form construction.
   d. Handling, placing and setting to line and grade all items to be embedded in the shield wall and in the dome.
   e. Forming for blockouts in shield wall, installing waterstop, removing forms and patching voids or honeycomb areas.
   f. Placing, finishing and curing concrete by the slip form method for the shield wall and the dome by conventional 2 stage construction.

3. Scope of Inspections:

   a. Material receiving inspection
   b. Form erection inspection
   c. Placement area preparation inspection
   d. Concrete placement inspection
   e. Concrete finishing and curing inspection
   f. Concrete repair inspection
   g. Dome form decentering inspection
   h. Reinforcing steel placement inspection

4. QA Program Requirements/Contractual Commitments:

   Fegles - Shield Wall Construction: December 1975 to August 1976

   a. QA/QC Personnel except Auditors - ANSI N45.2.6 and Fegles Procedure QAP-303, "Quality Assurance Plan" and QAP-303 Supplement #2, "Personnel Qualifications".
   b. QA Auditors - QA auditor must be a Corporate QA Manager.

   Fegles - Dome Construction: February 1979 to February 1980

   a. QA/QC Personnel except Auditors - ANSI N45.2.6 and Fegles Procedure QAP-303.21, "Qualification of Inspection Personnel".
   b. QA Auditors - QA Auditor must be a Corporate QA Manager (Level III).

5. Inspector Qualification and Dispositioning of Deficiencies:

The Verification Program identified three Fegles QC personnel (out of the original seven (7) identified on CAR EQA84-20) who performed quality inspections and whose qualifications were determined as not meeting the requirements of ANSI N45.2.6-1973. Corrective Action Request EQA84-20 was initiated to track the disposition of this deficiency.

Ebasco QA has determined that these three Fegles QC personnel were involved only with the slip form operations (placement series G-511) from April to May of 1976. The three Fegles QC inspectors only performed preplacement inspections. These inspections were documented on the preplacement checklist. Further research concluded that although these three individuals did perform inspections, qualified Ebasco QC inspectors performed 100% duplicate preplacement inspections.

Accordingly, inspection by the Fegles personnel does not render the quality of the inspected construction activities as indeterminate. Adequacy of the inspected construction activities was independently confirmed by qualified inspectors.

SUPPLEMENT TO THE RESPONSE TO CONCERN NO. 13
SUBMITTED SEPTEMBER 4, 1984

DISCUSSION:

As committed to in the Corrective Action Plan/Schedule portion of the response to Concern No. 13, a review of Mercury NCRs has been performed by LP&L QA in accordance with procedure QASP 19.17 to determine whether any were improperly voided or administratively closed. Also, an accountability of Mercury NCRs was performed to reconcile whether a Mercury NCR document was issued/processed for each given number issued by Mercury Company. This was accomplished by both a review of the Mercury NCR log and a review of the Mercury NCR documents to assure that the specific categories of NCRs questioned by the NRC within the SSER 7 were obtained.

The results of the review performed on the voided and "administratively closed" NCRs has determined that, except as noted below, they were appropriately processed and closed. Cases were found where the documentation to support closure was referenced, but not in the Mercury NCR file. This documentation is being retrieved from the appropriate files reviewed by LP&L QA and placed into the Mercury NCR files. Also, the review has shown that all but two of the Mercury NCRs can be accounted for and that two NCRs were incorrectly administratively closed and one was not processed. Attachment 1 details the processing/ resolution of these five NCRs.

In addition, this supplement provides within Attachment 2 some further clarification as to the processing/resolution of NCR-W3-859 and NCR-W3-981, submitted in the response to Concern No. 13.

There is no change to the previously stated Cause, Generic Implications, Safety Significance and Corrective Action Plan/Schedule.

An addition to the CAUSE as stated in the initial response is:

In the case of Mercury, two NCRs were found to be missing, however investigation revealed these were isolated instances and there was no lack of resolution of the underlying problems.

Mercury failed to process three other NCRs.

An addition to GENERIC IMPLICATIONS as stated in the initial response is:

This isssue has been approached generically. The review has encompassed Mercury voided and administratively closed NCRs and all identifiable missing and unprocessed Mercury NCRs.

ATTACHMENTS:

1. Mercury NCRs that are missing or were never processed.

2. Discussion of site NCRs W3-859 and W3-981.

REFERENCES:

None

ATTACHMENT 1

MERCURY NCRs THAT ARE MISSING OR WERE NEVER PROCESSED

Mercury NCR-2685

The description provided in the NCR Log indicates that this NCR was written against OCR 1029, instrument number DPI/DPS-HV 5009A, Drawing No. 853-L-183-A to identify "no-fit up date" as the nonconforming condition.

Since the description noted in the log was not specific as to what item(s) did not have a fit-up date, four areas were considered. These areas are the following:

1) Tubing - The tubing on the noted drawing is ANSI B31.1 and therefore no documented inspection would be required.

2) Instrument Stand - The instrument stand is installed per Instrument Installations Detail B430 - X14 which is a non-seismic stand and therefore no documented inspection would be required.

3) Tube Track - The tube track on the drawing is seismic but no fit-up inspections were required.

4) Seismic Supports - There were 19 seismic supports on the subject drawing. These supports required a documented fit-up inspection. After reviewing the documentation for all 19 supports, it was determined that only one Support Locator (No. 12) was missing a fit-up inspection date on the "Support Inspection Report" form (262-1).

   Further search revealed that the "Support Inspection Report" form shows a late entry of the fit-up inspection date for Support Locator No. 12 made by the same person who initiated the NCR. It is deduced that the same individual identified the nonconforming condition and then corrected it.

As a result of this investigation, LP&L concludes that the condition identified by the missing NCR was corrected and documentation is available to show resolution.

Mercury NCR-2242

The Mercury NCR Log entry for this NCR was crossed out by the log keeper noting that the NCR was written in error and that the number was never used.

It was found that at about the same time two more entries were made against the same OCR number, the same drawing number and the same instrument that were noted against NCR-2242. The new entries were NCR-2264 and NCR-2285. NCR-2285 was closed with the notation that the same problem was tracked via NCR-2264.

Mercury NCR-2242 Cont'd)

From the description provided in the NCR Log, the same instrument was identified on all three NCRs and it was resolved under NCR-2264. Since the NCR Log does not describe the specific nonconforming condition, further research was performed to determine if any situation existed which may have gone unaddressed. A review of Mercury QC inspection reports (Form 211) of the same period revealed that three different QC inspectors noted the same condition during three different walkdowns and recommended that NCRs be issued to correct the discrepancy. Furthermore, a Form 211 was found which records that an inspection was performed that verified the correction of the discrepancy and thus the closure of NCRs 2264, 2285 and 2242.

As a result of this investigation, LP&L concludes that the condition identified by the missing NCR was corrected.

Mercury NCRs that were never Processed

Three nonconformances that were issued but were incorrectly administratively closed or not processed by Mercury Q.A. Department were NCR-888 dated 9-19-82, 889 dated 9-19-82 and 2734 dated 3/10/84. Mercury should have processed these NCRs; subsequent actions have resolved the deficiencies contained therein. The rationale by Mercury for not processing the NCRs and the resolution by Ebasco to the NCR concerns are provided below:

NCR-888

This NCR was generically written stating the several Q.C. personnel have been certified to Level II without documented evidence of qualification requirements. At the time Mercury's management response was that the NCR was not processed based on "1) initiator not a Mercury employee at time of writing 2) QCP-3110 paragraph 1.4 references QCP-3040 which does not apply to W-3 3) ANSI N45.2.6 provisions incorporated by QCP-3050 as approved. All Mercury Company QC techs are trained and tested per QCP-3050 prior to performing inspections or tests."

Ebasco's current review of the above document determined that: a) The initiator was terminated on the same date the NCR was initiated. b) Recently a review of all Mercury's quality assurance/quality inspection personnel has been undertaken for adherence to procedural and ANSI requirements relative to qualification/ certification status. The concern as stated in the NCR and reinspection is addressed and resolved by the in-depth qualification/verification review being accomplished under Concern No. 1.

NCR-889

This NCR was generically written noting a change to actual field installation versus Mercury's Q.C. support installation documentation. Mercury's Support Verification Group and Mercury's Documentation Review Group had identified numerous deficiencies relative to hanger installation traceability.

At the time Mercury's management response to this NCR was that the NCR was not processed based on: "1) Initiator not a Mercury Company employee at time of writing. 2) The situation has already been identified by LP&L Audits, Ebasco Audits, Mercury Company Audits and case-by-case NCR's. There is insufficient information to process an NCR of this description. Mercury Company has established a program to investigate, evaluate and report on these conditions with LP&L and Ebasco Q.A. concurrence."

NCR-889 (Cont'd)

Ebasco's current review of the above document determined that: a) The initiator was terminated on the same date the NCR was initiated. b) Since the time this NCR was initiated, numerous efforts have been undertaken to verify that as-built field conditions do in fact reflect the Mercury as-built drawings:

1) Ebasco Q.C. verification of supports per procedure ECRRI-3. A total of 1852 supports were inspected for configuration, dimensions, location, amount of weldment.

2) LP&L Construction Q.A. walkdown during the status review of turnover of systems. This consisted of 114 instrument supports.

3) All N1 (approximately 1600) supports were inspected and documented in accordance with LP&L procedure QASP-19.15.

4) Mercury NCR-3578 was upgraded to Ebasco NCR-W3-6512 which generically addressed traceability of Mercury supports.

Based on the above efforts and the resulting documentation, the concern stated on the NCR is considered to be resolved.

NCR-2734

Maximum lengths 4" x 3" x 1/4" angle were exceeded on supports 8-000-H-013N, 17-000-H-008N, 18-000-H-013N by 1", 2" and 4" respectively. Mercury failed to process this NCR.

Ebasco initiated CIWA 018917 to evaluate the cited problem. Ebasco (ESSE) has evaluated the condition and found it to be acceptable. LP&L has concurred with ESSE evaluation.

ATTACHMENT 2

DISCUSSION OF SITE NCRs W3-859 and W3-981

NCR-W3-859

The NCR log entry for NCR-W3-859 indicates "Erection of Plant Process Piping" under subject and it gives a void date only. The Ebasco Site QA transmittal log has no entry relative to this NCR and a search of files in the Site QA records vault and other locations, did not locate the subject NCR.

A review of documentation pertaining to Ebasco QA audit and surveillance activities relevant to the timeframe and general subject of the entry was performed. It was determined that Ebasco Site QA had performed an audit of the piping contractor's site welding program which identified four findings. There is a possibility that these findings were presented to Ebasco Site QA Management for evaluation and an entry in the log made to obtain an NCR number. Subsequently, it was probably decided that the findings should be identified in the audit report and not the NCR and the entry in the log was voided.

As a result of this investigation, LP&L concludes that NCR-W3-859 was never issued.

NCR-W3-981

The NCR log entry for NCR-W3-981 shows a July 18, 1978 date of preparation and includes a specific heat number, type and size of welding electrode. The Ebasco Site QA transmittal log has no entry relative to this NCR and a search of files in the Site QA records vault and other locations, did not locate it.

A review of documentation in file, applicable to the subject welding electrodes heat number revealed that the manufacturer of these electrodes had submitted a corrected certified material test report for that heat number.

Apparently, Ebasco Site QA had anticipated that an NCR would be necessary to identify deficiencies in the original certified material test report that was submitted with the welding electrodes and a NCR log entry was made. However, the receipt of the corrected certified material test report resolved the deficiency and the entry was voided.

As a result of this investigation, LP&L concludes that NCR-W3-981 was never issued.

RESPONSE

ITEM NO: 20

TITLE: Construction Materials Testing (CMT) Personnel Qualification Records

NRC DESCRIPTION OF CONCERN:

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.

DISCUSSION:

As requested by the staff, LP&L has pursued and obtained additional information on the GEO individuals performing inspections and tests as will be explained in the sections of this response entitled "Collection and Verification of Personnel Data" and "Disposition of Deficiencies". Also, evaluations have been made of work performed by GEO personnel as briefly outlined herein.

A verification program was implemented to review the professional credentials of 100% of the site QA/QC personnel who may have performed safety-related functions at Waterford 3, including supervisors, managers and remaining QA/QC personnel. Assessment of the qualifications of all GEO Construction Material Testing (CMT) personnel, including those identified in Attachment 6 of Ebasco NCR W3-6497 (the NRC reference to Ebasco NCR W3-6487 is apparently a typographical error), was a part of that verification program.

The responses to Issues No. 1 and 10 discuss inspector qualifications for other Waterford 3 contractor personnel.

The program, which is being performed under the overall direction of LP&L, consists of three major elements:

- Collection and verification of personnel data.
- Evaluation of qualifications against specified standards.
- Dispositioning of deficiencies resulting from cases where inspections, tests or data collection were conducted by personnel whose qualifications against the appropriate standards could not be confirmed.

Collection and Verification of Personnel Data

Personnel data were collected from various sources, including site files, contractor home office files, personal contact with individuals or supervisors and a thorough background verification program.

Efforts were made to verify the education and work experience of 100% of the GEO-CMT QA/QC personnel by researching Waterford 3 GEO-CMT records and by contacting schools, former employers and others. While the success rate of the background verification effort for GEO-CMT was good, there were cases where confirmatory information was not obtainable. In such cases, the judgement of the LP&L Review Board, as described below, was used to rule on the reliability of the available information.

Evaluation of Qualifications to Specified Standards

QA/QC personnel data were evaluated in order to classify individuals as either having verified qualifications or not. Training, education and work experience were the qualifications of primary concern. These qualifications were verified against the following criteria:

(1) Inspectors - ANSI N45.2.6-1973

(2) Other QA/QC Personnel - QA Program requirements

Initial qualification determinations for GEO-CMT personnel were performed first by Ebasco and n separately by an LP&L review group. In order to control the consistency of these determinations, approved procedures were utilized. Determinations related primarily to balancing education, experience and training factors.

The LP&L review group qualification determinations were rendered in two categories: "qualified" and "potentially not qualified". "Potentially not qualified" determinations were referred to an LP&L Review Board comprised of senior LP&L QA personnel. The Review Board determinations were further reviewed by a consultant very familiar with inspector qualification and related standards. This process resulted in a final determination for all QA/QC personnel as either "qualified", or "unqualified".

The qualification review process is described in QASP 19.12 and QAI-32. The following points further clarify the process:

1. The meaning of the term "unqualified" must be amplified. In some cases determinations were made that, based on verified data, individuals' backgrounds did not warrant qualification to ANSI N45.2.6-1973. In other cases, however, individuals were considered "unqualified" as an expedient in reaching resolution to the concern. This occurred in cases in which:

   a. Research of records, inquiries to past employers and employees contact with schools and verification of training received was either not possible or could not be concluded in a reasonable period of time.

b. Apparent discrepancies existed between background information provided by some individuals and that obtained in the verification process, and resolution could not be achieved on a timely basis. Minor discrepancies were excused; however, significant discrepancies generally rendered any other significant but unverified data as suspect.

2. In the process used, being judged as "unqualified" to ANSI N45.2.6-1973 did not automatically render the individual's work as invalid. For example, an individual may not have the education and experience qualifications for all inspection work, yet be fully competent through specific training to perform the particular tasks assigned to him, which might have been very simple and repetitive in nature. Such an individual potentially satisfies ANSI requirements, which ultimately require that an individual's qualifications be sufficient to provide reasonable assurance that the individual can competently perform a particular task. Whether or not the individual is technically qualified, the individual's work can be deemed valid.

3. During the construction period, GEO made undocumented judgements with respect to the need for eye examinations for inspection personnel. Such judgements were based on the level of visual acuity or color perception required to achieve competent inspections. Such judgements were also made as part of the verification program and disposition process and will be documented. It is noted that such judgements are specifically suggested in ANSI N45.2.6-1978. This factor was not deemed disqualifying.

4. Some individuals were classified as inspectors but performed no safety related inspections and were otherwise not involved in quality related work. To the extent such individuals were identified, they were excluded from the overall inspector population.

Disposition of Deficiencies

For those individuals found "unqualified" the LP&L review board initiated Corrective Action Request (CAR) EQA84-11 to formally disposition the identified deficiencies. Ebasco NCR-W3-6497 will be reopened to reflect the disposition of that CAR.

Disposition of CAR EQA84-11 was accomplished by 3 methods as follows:

1) Assessment of Key CMT tests and of skills required to perform these tests.

The key tests were as follows:

a) Concrete - The most important test is the final cylinder break test as this test serves to confirm the strength of the concrete actually placed in the structure. Other tests on concrete are generally either performed as measures to avoid subsequent replacement of sub-specification concrete or were performed in collecting the concrete for and preparing of the test cylinders. The break test requires minimal skill in setting up and starting a compression device which compresses a pre-molded cylinder to failure. A large gauge records the force required which is easily translated into the data required.

Further confidence in the quality of the as-built material is provided by the fact that improper operator action would tend to degrade test results, i.e., improper testing would cause the concrete to appear less strong than it actually is.

b) Soils - The most important test is the field density test as it measures whether the backfill material has been compacted to specific requirements. The field portion of the work, which was performed by the technician, consisted of digging a small hole and placing the removed soil in an airtight container, positioning a rubber balloon apparatus over the hole, inflating the balloon to a predetermined pressure and reading a volume indicator scale.

Further, confidence in the quality of the as-built material is provided by the quantity of tests conducted. As stated in the engineering report supporting the response to issue 7, to insure control of backfill placement approximately three times as many field density tests were conducted as required by the technical specifications.

c) Cadwelds - There was only one test on cadwelds conducted by GEO-CMT and that was the break test. This test is as simple as the concrete break test. The test specimens are secured in a tension device, tension is applied and the failure strength is read from a gauge and recorded.

The review indicates all cadweld tests were conducted by personnel qualified to ANSI 45.2.6 (73)

It has been determined that only minimal training would be required for an unskilled individual to become proficient in performing the above tests. A single demonstration coupled with minimal practice under proper supervision is sufficient. GEO has formally confirmed that "Prior to being assigned to production work, all personnel were trained to perform the work required." On the basis of the above, though not strictly qualified to ANSI N45.2.6-1973, individuals could be considered competent to perform the technician or data collection type functions described.

2) Quality of Testing Performed by Personnel in Question

A detailed analysis was conducted of inspection/testing performed by a large sample of Level I personnel in question. This sample is felt to include the most significant exposure in terms of potential for inferior inspection/testing. Level II and III personnel either performing or directly supervising the performance of the tests described above should be competent to perform such functions.

3. Engineering Evaluation

A statistical analysis was conducted, using industry standard techniques, to evaluate test results for concrete and the class A backfill (Reference 3). In the case of concrete both the overall and within-test coefficients of variation demonstrated excellent control of the product which would not be the case had the tests not been well conducted. Backfill test results also demonstrate good consistency. This evaluation verifies the overall adequacy of the work of all levels, Levels (I, II and III) of GEO-CMT QC personnel.

As stated before, all cadweld tests were conducted by personnel considered qualified.

CAUSE:

Implementation of ANSI N45.2.6-1973 allows substitution for education and experience levels by noting that "... education and experience requirements specified for the various levels should not be treated as absolute when other factors provide reasonable assurance that a person can competently perform a particular task." GEO and its predecessor organizations issued certifications of qualifications for testing personnel under successive programs which employed such substitutions and which became more detailed and better documented with time. The program in place since 1978 generally parallels the ANSI Standard for inspector certification. However, the verification program revealed that verification of background data was not adequate or documented, documentation of the justification for substitution of other factors for the requisite degree of training, education or experience was sometimes not provided, lacked depth, was not totally in accord with contractor procedures or the ANSI standard, as currently interpreted.

GENERIC IMPLICATIONS:

This issue has been treated generically. The scope of the verification program included 100% of the QA/QC personnel of all site contractors who may have performed safety-related work, including GEO CMT personnel.

With regard to future work, qualification and certification of inspectors (including NDE personnel) will be administered through strict compliance with LP&L Nuclear Operations Procedures which meet the requirements of Regulatory Guide 1.58 Rev. 1 (ANSI N45.2.6-1978) and SNT-TC-1A-1975, as applicable.

SAFETY SIGNIFICANCE:

The results of the verification program and evaluation of the work performed by "unqualified" GEO CMT personnel provides reasonable assurance that the related installations will perform satisfactorily in service. There is no recognized reason that this issue should constrain fuel load or power operation.

CORRECTIVE ACTION PLAN/SCHEDULE:

On the basis of Reference 3, CAR EQA84-11 has been dispositioned.

REFERENCES:

1. QASP 19.12, Review of Contractor QA/QC Personnel Qualification Verification

2. QAI-32, Instructions for Verification of QA/QC Personnel Qualifications

3. Engineering Evaluation of Report on the Review and Analysis of the work of GEO - Construction Material Testing.

ITEM: COLLECTIVE SIGNIFICANCE

PURPOSE:

In response to the twenty-three issues identified in the NRC letter of June 13, 1984, LP&L has provided the NRC with a program plan describing the ongoing activities to resolve the NRC's concerns. The twenty-three responses developed in accordance with that program plan have addressed the specific NRC concerns. As part of that effort, the findings of each issue were evaluated to determine the "cause" and "generic implications". That evaluation process was conducted in a manner that allowed commonalities between the various issues to be considered and factored into the generic implications of one or more issues, where appropriate.

The purpose of this assessment of collective significance is to evaluate the overall significance of the findings from the twenty-three evaluations to achieve the following objectives:

- Identify and assess the significance to safety and to the construction program of the findings from the evaluations of the twenty-three issues.

- Identify actions that could have prevented occurrence of the twenty-three issues and thereby identify the lessons learned which, if implemented, would provide reasonable assurance that such deficiencies would be precluded from occurring in the future.

- Review the LP&L operational phase Quality Assurance Program to determine whether the lessons learned are reflected in the Program or whether additional modifications to the Program are warranted.

The conclusions that have been reached in this assessment of collective significance are discussed in the following sections. The principal conclusions are as follows:

- In response to Issue 23, "QA Program Breakdown Between Ebasco and Mercury", LP&L committed to further address areas needing improvement in the QA program in this assessment of the collective significance of the 23 issues. Having completed the assessment, and in consideration of problems related to Mercury in many of the other issues, it is apparent that programmatically the corrective action was not sufficiently thorough. Thus the partial breakdown acknowledged in 1982 with respect to Mercury was not totally corrected. However, overall site performance improved, particularly with respect to the quality of installed hardware, and there was no escalation into an overall breakdown of the QA program.

- The 23 issues have been thoroughly analyzed. The process has involved more than 1000 man-months of effort, exclusive of over 100 man-months expended by the NUS Task Force Support Group. The results, reflecting the general quality of the QA program and of the construction work itself, provide a high degree of confidence that the structures, systems and components as constructed are adequate to protect the public health and safety during operation. Only very limited hardware rework has been undertaken as a result of the twenty-three concerns, and in several cases this rework has been discretionary.

- The lessons learned from the twenty-three concerns provide a reasonable basis to determine whether the operational phase of the Quality Assurance Program adequately addresses the problems which occurred during construction.

- The assessment of the operational phase Quality Assurance Program has provided reasonable assurance that the program is adequate to preclude similar problems.

This process, though extensive, clearly has been valuable to LP&L. The process has identified areas for improvement in the LP&L QA program and has reconfirmed the safety of the as-built plant.

This discussion of collective significance is divided into the following three parts:

1. Assessment of Construction Program and Safety Significance
2. Identification of Lessons Learned
3. Operational Phase QA Program Assessment

ASSESSMENT OF CONSTRUCTION PROGRAM AND SAFETY SIGNIFICANCE

To assess the safety significance of the 23 issues to the as-built plant, the issues have been categorized according to the effort needed to resolve the concern (See Table 1). Four categories have been created as follows:

- Mercury: Those issues involving resolution of work within the scope of Mercury's effort. With the exception of Issue 23, all are also discussed in the following three categories.

- Software: Those issues involving records reviews or limited action such as clarification/correlation of records, engineering evaluation, record analysis, or procedural changes.

- Inspection/Evaluation: Those issues involving reinspections and engineering evaluations for resolution.

- Hardware: Those issues involving physical rework to address the findings.

The significance to the construction program in terms of whether weaknesses have been corrected and the nature of the weakness is treated on a case by case basis.

1. Mercury Work:

Ten of the 23 issues dealt in varying degrees of specificity with the Mercury program. Issue 23 "QA Program Breakdown between Ebasco and Mercury" dealt expressly with the effectiveness of the corrective action program undertaken by LP&L as a result of the problems identified in the Mercury program in 1982. Additional questions as to the effectiveness of the QA review of Mercury work are included in the following NRC concerns:

Issue	Title
1	Inspection Personnel Issues
2	Missing N1 Instrument Line Documentation
3	Instrumentation Expansion Loop Separation
4	Lower Tier Corrective Actions
6	Dispositioning of Nonconformance & Discrepancy Reports
13	Missing NCRs
14	J.A. Jones Speed Letters and EIRs
17	QC Verification of Expansion Anchor Characteristics
22	Welder Qualifications (Mercury) & Filler Material Control (Site Wide)

Analysis of these concerns shows (a) improvement in, but continuing problems with, the control of Mercury efforts during construction, and (b) ultimate success in assuring the adequacy of the work within the Mercury scope.

Improvements in the control of Mercury work are detailed in response to Issue 23. These include a June 1982 LP&L order for Mercury to cease safety related installations until there had been extensive Mercury organizational changes, additional staffing to address quality inspections/reviews, training to provide the guidance/direction needed for quality results, and the establishment of an Ebasco Management team to provide support and management oversight of the Mercury program. Subsequent improvements in control over Mercury included both ongoing administrative and quality program changes, and gradual reductions in the Mercury scope until a full demobilization by November 1983. A review of the post June 1982 work demonstrated a significant improvement in both the quality of installations and the quality of documentation.

Notwithstanding improvements in the Mercury program, problems continued. Most importantly, generic implications of identified problems were not sufficiently addressed. Had they been, many of the problems identified by the NRC would have been identified by LP&L. For example, a significant number of QC inspectors hired by Mercury as part of the 1982 corrective action were apparently not sufficiently qualified to ANSI N45.2.6-1973, and this was not discovered in the QA process. As an indication of the ongoing problem, Mercury did not process NCR-888 to address concerns that QC personnel were not properly qualified. This action could have then resulted in a more effective corrective action to address the Mercury concerns as well as early identification of the issues found in Issues 1, 10 and 20.

While there were continuing problems with control of Mercury, the as-built condition of Mercury work, as determined by LP&L, is adequate to assure the public health and safety. This is demonstrated by reverification and testing activities both as a part of the Mercury corrective action program established in 1982 and as a part of the responses to the twenty three issues. The reverification activities encompass all types of Mercury safety-related work. (See Responses to Issue 1 and Issue 23) As shown in the response to Issue 1, an extensive reinspection of all N1 instrument lines resulted in a small amount of rework, most of which was elective and none of which was significant to safety.

2. Software:

The resolution of six of the twenty-three identified issues was achieved through actions limited to such tasks as reconciliation/ correlation of records, records analysis, records reviews, statistical analysis, engineering analyses, etc. Collectively, the evaluations of these concerns indicate that the past actions to address weaknesses in plant records had shortcomings but that these did not result in problems implying inadequacies in plant hardware.

In responding to Issue 5 "Vendor Documentation - Conditional Releases", a review was performed of the material receiving and control systems as well as other areas with a potential for a similar situation (i.e. concerns noted on Release for Shipment Forms, Ebasco Home Office controlled NCR's, and material received under manufacture, deliver and erect type contracts). It was determined that the problems were limited to the absence of the formal tracking required by existing procedures for conditional certifications in Combustion Engineering documentation packages. There was an undetected violation of procedures but based on a review of CE purchase orders, it was concluded that there would have been no safety consequences if the deficiency had remained uncorrected.

Issues 7 "Backfill Soil Densities" and 11 "Cadwelding" involved analyses of records. For Issue 7, records correlation had not been completed because some were in the Ebasco vaults and some had not yet been obtained from the contractor who, it should be noted, was still onsite and active. The correlation, review and analysis demonstrated that there was good work control, that specification requirements were generally exceeded, and that the backfill was adequate to perform its design function. In Issue 11, the quantity of data did not allow ready analysis to demonstrate the attributes desired. Therefore, LP&L transcribed cadweld data onto computer storage to demonstrate compliance with Regulatory Guide 1.10 and specification sampling frequencies. The review identified three minor discrepancies not identified in the prior NCR and these were evaluated and found to be acceptable.

Issue 8 "Visual Examination of Shop Welds During Hydrostatic Testing", was the result of a checklist that only identified field welds. This concern had been previously identified in June 1983 and dispositioned to demonstrate the adequacy of the visual examination of shop welds and the lack of any safety impact. The review gives no indication of deficiencies.

The records reviews for Issue 13 "Missing NCR's" included site NCR's, Ebasco Home Office NCR's, and Mercury NCR's and demonstrates that, although documentation was not readily available to answer some of the concerns, there was no loss of control over NCR's that would currently imply open questions about the acceptability of installed safety systems. The cause of most of the concerns related to Ebasco NCR's was identified as a change in record keeping in 1979, a temporary practice that allowed NCR numbers to be issued prior to the NCR being written, and the use of a preassigned block of NCR numbers. The review of Mercury NCR's concluded that there was one missing NCR which did not represent an unresolved condition, one superceeded NCR, and three NCR's which had not been processed by Mercury. These three NCR's, one of which is covered by Issue 1, have now been resolved. The cause was Mercury's improper application of their own procedures.

Issue 16 "Surveys and Exit Interviews of QA Personnel" involved an LP&L initiative for obtaining employee feedback on potential safety concerns. The shortcomings of the initial program have been addressed. The exit interview program has been completely restructured and is providing a very useful service in obtaining feedback on individual's concerns. Feedback received prior to the restructuring is being reanalyzed and concerns are being closed through an orderly closure process.

3. Inspection/Evaluation:

Nine of the twenty three issues were resolved by reinspections, engineering evaluation, statistical sampling, or similar efforts but required no changes to the plant hardware. An evaluation of these concerns leads to a conclusion there were weaknesses in plant records but these weaknesses have now been addressed and do not represent a potential hardware deficiency.

Three of the Issues, 1 "Inspection Personnel Issues", 10 "Inspector Qualification - J.A. Jones & Fegles", and 20 "Construction Material Testing (CMT) Personnel Qualification Records" involved a review of professional credential and education/employment checks on 100% of the site QA/QC personnel involved in safety related activities. In this review, QA/QC personnel have been classified using conservative and standardized acceptance criteria as "qualified" and "unqualified". These classifications were reviewed and finalized by an LP&L Review Board of senior QA personnel and subsequently by a consultant very familiar with inspector qualifications and related standards. For "unqualified" inspector personnel, Corrective Action Requests were written to formally track and disposition potential deficiencies. For Mercury, substantial reinspection was initiated, particularly for the N1 tubing installation, and rework is covered in the next section. For most contractors reviewed under Issues 1 and 10, the disposition of deficiencies has not required reinspection. In the case of Issue 20, an engineering evaluation of the work of CMT personnel has established that questions about personnel qualifications have not rendered the work indeterminate. For corrective actions not yet completed, there have been many other methods (e.g. ANI, NDE, prerequisite preoperations/ integrated testing, overinspections, etc.) which provide assurance that quality has been built into the plant. To date, there have been no safety significant hardware changes found and this provides positive evidence as to the adequacy of the overall construction program.

Issue 4, "Lower Tier Corrective Actions Are Not Being Upgraded to NCR's" required an extensive effort to review document packages, based on a statistical sample, to ascertain whether they had been properly upgraded to NCRs, whether the disposition was adequate, and whether proper reporting per 10CFR50.55(e) and 10CFR21 had occurred. The review identified minor weaknesses in the construction program in following procedural criteria for lower tier documents with regard to voiding and upgrading to NCR's. While it does indicate a deficiency in the construction program, it does not indicate that there was a loss of control over non-conforming materials, parts, or components. This conclusion is supported by the results of a statistically justified sampling program.

The resolution of Issue 9 "Welder Certification" identified adequate welder certification but found that the records for seven instrument cabinets were incomplete or missing. The adequacy of the welding performed by J.A. Jones has been reviewed. In cases where welding deficiencies were identified, the welds were dispositioned to be acceptable as is. The missing or incomplete documentation identifies a loss of control in records management but the acceptable dispositioning of the welds and the results of the complete review of the J.A. Jones welding scope demonstrates the overall adequacy of the J.A. Jones welding.

A sampling program of the information request documentation used by contractors was undertaken in order to resolve Issue 14 "J.A. Jones Speed Letters and EIRs". In the case of approximately one third of the contractors, instances were identified where design changes were made by information requests without appropriate documentation. This was determined by taking a minimum 10% random sample of each contractors information requests (for fifty or less such documents, there was a total review) and expanding that sample by 10% increments wherever there was a violation of design control. Approximately 5% of the total IR's evaluated (approximately 6000) involved design control but no rework was required except for that being conducted within the scope of SCD-78 (American Bridge Welding Deficiencies). It was concluded that the lack of control exercised over these contractors was a deficiency in controlling records in accordance with the construction program procedures. There are no remaining open issues.

The response to Issue 17 "QC Verification of Expansion Anchor Characteristics" recognizes a shortcoming in not specifically delineating all characteristics on an inspection checklist although the necessary characteristics were listed elsewhere. The expansion anchors were the subject of several different corrective action programs as part of the overall effort to verify the adequacy of Mercury's work. These corrective actions previously addressed the NRC concern except for several technical questions which have been resolved. A 100% reinspection of Mercury N1 instrument installations has been completed and provides further evidence of expansion anchor adequacy. The shortcomings in the original inspection checklist are considered a procedural deficiency in the construction program, but a current lack of safety significance was demonstrated.

Issue 18 "Documentation of Walkdowns of Non-Safety Related Equipment" resulted from the documentation by exception practices used during previous plant "two over one" walkdowns. To resolve this concern, a detailed reinspection under a formal engineering procedure was performed of the instrument air system and two plant areas to provide additional confidence in the original design and walkdowns. This reinspection found no deficiencies and supported a conclusion that the construction program was adequate and there are no unresolved safety deficiencies.

The resolution of Issue 21 "LP&L QA Construction System Status and Transfer Reviews" involved demonstrating adequate control of comments and open items in the system transfer and testing process. As a result of extensive efforts on this matter, including confirmatory field verification of three items, it was determined that no significant comments or open items were untracked and that there was no impact on testing or system operation.

There were two separate issues in Issue 22 "Welder Qualification (Mercury) and Filler Material Control (Site wide)". The first, welder qualifications, was resolved by a thorough review of welder documentation and welder qualification. No significant deficiencies were identified and those minor deficiencies identified were properly dispositioned. Concerns over weld filler metal controls were addressed by a review which showed site practices to be unclear with regard to ambiguities between various code requirements. Further, justification of several past corrective actions was provided where there had been deviations from the site procedure. In both cases, the evaluation demonstrated that, although there were deficiencies in procedural clarity and the control of site practices, no unresolved safety issues exist.

4. Hardware:

Seven of the twenty-three issues involved hardware changes in addition to inspections, evaluations or other software activities to resolve the concerns. A review of these concerns has shown that, if left uncorrected, two of the reworked items presented a potential safety concern. Of these two, one was related to rework on a three foot section of tubing and the second represented a case where the safety significance was not determined. It has been concluded that while construction program deficiencies existed these did not warrant an implication that the corrective action system as currently implemented was inadequate to provide assurance that the plant is safely constructed.

The N1 instrumentation walkdown initiated in response to Issue 1, "Inspection Personnel Issues" has identified deficiencies that, if left uncorrected, would not have effected the safety of plant operations. The conclusions on Mercury correction actions were discussed earlier.

A lack of documentation consistent with 10CFR50 Appendix B requirements for local mounted instruments installed to ANSI B31.1 was evaluated in Issue 2 "Missing N1 Instrument Line Documentation". In responding to the concern, 18 installations were identified as having documentation insufficient to meet the objective requirements of Appendix B. Based on documentation reviewed, the as-built installations were considered capable of performing their intended functions. Nevertheless, a decision was made to rework the installations to standardize compliance with ASME code requirements. This records deficiency in the construction program was found to have resulted in no safety significant deficiencies. The rework was performed as part of a conservative corrective action.

Issue 3 "Instrumentation Expansion Loop Separation" identified a procedural implementation deficiency in the construction program occurring when insufficient attention was given by Mercury personnel to specified installation separation criteria. Reinspections of those installations identified by the NRC as well as installations where tubing lines were run in proximity to each other resulted in the identification of additional deviations to the separation criteria. With the exception of one-three foot section of tube track all were found acceptable "as-is". The necessary rework has been completed. It was concluded that this was a deficiency in the Mercury corrective action but was of limited safety significance because of the isolated nature of the rework.

Issue 6 "Dispositioning of Nonconformance and Discrepancy Reports" identified specific Ebasco and Mercury NCRs and Ebasco DRs in which the NRC had concerns relative to dispositioning, lack of supporting documentation, accomplishment of related rework and sufficiency of engineering justification of dispositions. A review of these Waterford 3 records was conducted and no condition was found which, were it to have remained uncorrected would have adversely affected the safety of operations of Waterford 3. LP&L had previously initiated a program in February 1984 to address Ebasco NCRs. This program was expanded to encompass the NRC request and is nearly complete. While some discrepancies were noted and several reinspections performed, rework was performed in only a few cases.

The most significant amount of rework occurred as a result of the findings in Issue 12 "Main Steamline Framing Restraints". In this case it was found that additional rework was identified from the review of American Bridge information requests and the incomplete scoping for open Significant Construction Deficiency 78. Rework was required to replace the framing bolts where documentation was not available and bolt identification could not be readily verified. Upon identification of the concern a conservative management decision was made to replace the bolts in lieu of attempting to test or sample test the bolts in question to determine their usability. Thus no determination was made regarding the safety significance of the existing condition. A rescoping of other significant open SCD's has been conducted to address potential concerns related to scoping practices. Deficiencies were corrected and no further safety concerns remain in this area.

Issue 15 "Welding of "D" Level Material Inside Containment" resulted in a reinspection of the most significant "D" level welds. The findings identify a deficiency in the construction program because no record keeping requirements were specified in the CB&I QA program for these type welds. The reinspection of welds identified weld deficiencies that were evaluated to be acceptable "as is" and a number of arc strikes that required rework (grinding) to demonstrate that no damage to base metal had occurred. It was concluded that the construction program weakness created no significant safety concerns and raised no unresolved implications with regard to the adequacy of the "as-built" plant.

Issue 19 "Water In Basemat Instrumentation Conduit" was evaluated by a walkdown to identify areas of seepage and potential direct paths for ground water. As a result of this walkdown a piezometer standpipe will be pressure grouted prior to fuel load to limit further seepage. This rework was identified even though the evaluation showed that there was no potential for flooding the auxiliary basemat. It was concluded that no construction program deficiencies or safety concerns exist.

4. Conclusions:

The twenty three issues have been assessed and corrective actions have been or are being taken to correct deficiencies found. The safety significance of ongoing activities and completed activities is being assessed for each of the plant systems required by technical specifications to be operable during the various operational modes. Those safety evaluations needed to support any phase of operation will be a prerequisite to LP&L requests for a license to operate in that phase.

The responses to the 23 issues, when assessed together, lead to two generic conclusions: (a) The QA program during the construction phase continued to have shortcomings, but with current corrective action the objectives and criteria of the construction program have now been met. The deficiencies fell primarily into the categories of records management and control of corrective actions. (b) The overall adequacy of the plant in the areas of the 23 issues is confirmed by the extensive re-evaluations and reinspections conducted in response to the 23 issues and by the minimal rework required as a result of the concerns. The plant as-built can be operated without undue risk to public health and safety.

IDENTIFICATION OF LESSONS LEARNED

Lessons learned were developed from the twenty-three issues for the purpose of evaluating the ability of the operational phase Quality Assurance Program to preclude the mistakes made during construction. These lessons learned are intended to define the types of actions which could have been taken to avoid the safety impacts that were identified. Table 2 presents the lessons learned as well as a brief description of the manner in which the operational phase Quality Assurance Program addresses the lessons learned. This approach allows definition of the actions needed to anticipate problems. The need to identify emerging QC problems in a timely manner and to take effective and timely corrective actions is also recognized. The next section provides a more complete description of the operational phase QA program to supplement the lessons learned table and to describe the management oversight, trending and corrective action programs that allow for prompt identification and action on problems.

TABLE 1
ACTIVITIES REQUIRED TO RESOLVE THE TWENTY THREE ISSUES

Concern	Software	Inspection/ Evaluation	Hardware (1)
1			D
2			D
3			L
4		X	
5	X		
6			D
7	X		
8	X		
9		X	
10		X	
11	X		
12			PS
13	X		
14		X	
15			D
16	X		
17		X	
18		X	
19			D
20		X	
21		X	
22		X	

NOTES:

(1) The safety significance of the hardware impacts has been indicated by a "D" where hardware changes were discretionary or in accordance with good practices, a "PS" where the safety significance was not fully evaluated, and an "L" where there was safety significance if left uncorrected but the significance was limited because of the isolated nature or limited extent of the deficiency.

TABLE 2

OPERATIONAL READINESS ASSESSMENT

	PAST	FUTURE
Issue	Actions Which Could Have Prevented Occurrence (Lessons Learned)	Reflection in Operational QA Program
1	This concern could have been avoided if a uniform and conservative standard had been imposed for judging QA/QC personnel qualifications and for documentation of those qualifications.	During the operations phase, LP&L and contractor inspection personnel will be certified to ANSI N45.2.6-1978 and Regulatory Guide 1.58 Rev. 1. Prior to certification a background investigation must be satisfactorily completed documenting a candidate's education and employment experience as described in Section II.D.
2	Recognize that quality records required by 10CFR50 Appendix B sometimes exceed the record keeping requirements of industry codes. The concern could have been avoided if the contractors had been required to supply the proper documentation.	Documentation (objective evidence of acceptance) requirements during normal operations are defined in drawings, specifications, and procedures. Review of specified documentation requirements associated with station modifications is an integral part of the operations phase design process. This review assures the appropriateness and completeness of required documentation. The Station Modification process is described in Section II.H.
3	This concern, which dealt with field run installations, could have been avoided by increased training of design/installation/ inspection personnel in order to increase their understanding of generic criteria and their ability to recognize deficiencies.	Under the operations phase QA Program field run items will be minimized and controlled by procedure. The Station Modification Package (SMP) process includes a checklist of generic criteria to be addressed. Additionally, the Detailed Construction Package will contain necessary acceptance criteria to direct the installer and inspector (see Section II.H).
4	The basic causes of this concern (which are not felt to be unique to Waterford 3) relate to the large number of specialty type quality contractors employed during the construction phase, coupled with inherent design/ construction interface problems associated with parallel design and construction. The problems in this issue accruing from the above situation could have been avoided had a more definitive and standardized quality deficiency program been developed and implemented.	During the operations phase a uniform program for quality deficiency identification and resolution will be employed. The Condition Identification and Work Authorization (CIWA) will be the primary means of identification and implementation of corrective action at Waterford 3. The quality deficiency mechanisms utilized by LP&L are described in detail in Sections II.B.1.a-e.

TABLE 2
OPERATIONAL READINESS ASSESSMENT

Issue	PAST Actions Which Could Have Prevented Occurrence (Lessons Learned)	FUTURE Reflection in Operational QA Program
5	The concern could have been avoided if it had been recognized that while CE handled certifications differently than other vendors that did not eliminate the requirement to track conditional certifications in order to ensure closure.	Any quality related material received on site with conditional certification is tracked in accordance with the procedures for Discrepancy Notices as described in Section II.B.1.b.
6	a. Some of the concerns could have been avoided by recognizing the need to have a more uniform process (LP&L, Ebasco, and contractors) for the disposition and resolution of deficiencies.	a. Under the operations phase QA Program, in order to provide standardization, hardware deficiencies will be identified through use of the LP&L CIWA (plant identified) or DN (receipt inspection identified) as noted in Section II.G.3.
	b. Some of the concerns could have been avoided by establishment of a routine process for additional verification (including field verification) of the resolution to assess the adequacy of dispositions and corrective actions. More emphasis should have been placed on a QA management overview designed to distinguish generic trends and root causes of deficiencies from isolated significant occurrences or repetitious occurrences of less significance.	b. All quality related deficiencies identified during the operations phase undergo verification review of the corrective action and disposition prior to closing out the deficiency. The deficiency identification and resolution mechanisms are described in detail in Sections II.B.1.a-f. As part of the semi-annual audit of the corrective action process, the QA Program will include a field verification audit of the CIWA closure process. In addition, Operations QA utilizes a QA Trending Programs to identify adverse quality trends and generic quality problems as described in Section II.B.1.a.
	c. Given the need for more consistent engineering judgement, some concerns could have been avoided by the use in training of specific disposition of past problems.	c. During the operations phase, the Quality Assurance Section holds monthly training sessions. Lessons learned or corrective actions as a result of quality deficiencies or undesirable programmatic trends identified at Waterford 3 will be reviewed during these sessions as described in Section II.E.2. Additionally, the QA Section will prepare, for distribution to plant staff performing quality related work, similar briefing material as a feedback mechanism for current quality concerns.

TABLE 2
OPERATIONAL READINESS ASSESSMENT

Issue	PAST Actions Which Could Have Prevented Occurrence (Lessons Learned)	FUTURE Reflection in Operational QA Program
	d. Recognize the need for ready retrieval/ control of records. This would be assisted by processing records as the work is completed through all required reviews, resolutions of comments, and necessary verification and then vaulting the records. This approach would have avoided some of the concerns that arose because of records retrievability.	d. Records are processed upon completion of the activity and verified complete by cognizant supervisory personnel. All Quality records during the operations phase are maintained by LP&L's Project Files. Documents are stored and cross-indexed to facilitate timely retrieval. Records management is further described in Section II.I. The current programs of record management at Waterford 3 are under review by LP&L management to ensure proper discipline and optimum utility exists. This review is expected to be complete, and any necessary programmatic changes will be initiated by November 30, 1984.
7	This concern could have been avoided if, as work was completed, records were retrieved from the contractor, processed through the required reviews, any necessary verification completed and then vaulted.	Records are processed upon completion of the activity and verified complete by cognizant supervisory personnel. Quality records during the operations phase are maintained by LP&L's Project Files. Records management is further described in Section II.I.
8	Shop welds, the subject of this concern, were hydrostatically tested and inspected and, therefore, no deficiency exists.	N/A
9	This concern could have been avoided if, as work was completed, records were verified as complete against the scope of work.	During the operations phase, any change in scope of the contractor's responsibilities would initiate an LP&L review of the applicable portions of the contractor's QA program similarly to what is required for a new contract. Such review would include document generation requirements. Section II.G further discusses the review of contractor QA programs.
10	This concern could have been avoided if a uniform and conservative standard had been imposed for judging QA/QC personnel qualifications and for documentation of those qualifications.	During the operations phase, LP&L and contractor inspection personnel will be certified to ANSI N45.2.6-1978 and Regulatory Guide 1.58 Rev. 1. Prior to certification a background investigation must be satisfactorily completed documenting a candidate's education and employment experience as described in Section II.D.

TABLE 2
OPERATIONAL READINESS ASSESSMENT

	PAST	FUTURE
Issue	Actions Which Could Have Prevented Occurrence (Lessons Learned)	Reflection in Operational QA Program
11	This concern could have been avoided if, in addition to in-process analysis conducted, a means to track the completion and correlation of data/records needed to verify compliance with specifications had been implemented.	This concern relates to bulk construction and is not applicable to the operations phase.
12	This concern could have been avoided if it had been recognized that scoping of complex corrective actions (e.g. multiple contractors, complex drawings, and construction interferences) required commensurate care in assuring that the scoping of the corrective action is accurate and tracked to assure completion.	Multiple levels of pre- and post- implementation review of corrective actions occur during the operations phase. Corrective action must be implemented and tracked through one of the deficiency identification mechanisms described in Sections II.B.1.a-e. Broad scope and complex corrective actions will be cause for development of a Special Procedure as described in QP-005-001, "Instructions, Procedures and Drawings", in order to control scoping and interfaces, and to establish a tracking mechanism to ensure completion and closure.
13	Some concerns could have been avoided through the use of a rigidly controlled tracking system to control special purpose hardware deficiency documents that have characteristics such as: multiple interfaces; require tracking during processing; and/or are needed to control quality related questions in a timely manner.	The operations phase QA Program provides for different means from the construction phase to identify, track, and resolve quality problems. The quality deficiency identification mechanisms, all of which provide for a controlled tracking system, are discussed in Sections II.B.1.a-e.
14	This concern could have been avoided if procedures regarding information requests had been standardized and controlled. The procedures should have been the subject of training to ensure a proper understanding and awareness of the procedure and limitations of the IR instrument. Audits could have been more comprehensive to assure that the program and procedures were being properly followed.	Plant modifications during the operations phase are accomplished through the Station Modification Program (SMP) described in Section II.H. Work is directed by the Detailed Construction Package (DCP) assembled under the Program. For cases where work cannot be done in accordance with the DCP, changes may be allowed only upon approval of a change to the Station Modification Package or, for minor changes, through approval of a Detailed Construction Package Change (DCPC). All work documentation, including DCPCs, is included in the CIWA post implementation review described in Section II.B.1.a, as well as the SMP closure review described in Section II.H.

TABLE 2
OPERATIONAL READINESS ASSESSMENT

	PAST	FUTURE
Issue	Actions Which Could Have Prevented Occurrence (Lessons Learned)	Reflection in Operational QA Program
15	The concern could have been avoided if contractors had been required to ensure adequate inspection documentation for Seismic Category I work outside the ASME Code jurisdictional boundaries.	Documentation (objective evidence of acceptance) requirements during normal operations are well defined in drawings, specifications and procedures. Review of specified documentation requirements associated with station modifications is an integral part of the operations phase design process. This review assures the appropriateness and completeness of required documentation. The Station Modification process is described in Section II.H.
16	This concern could have been avoided if the program had been auditable, if more formal training had been provided to the interviewers, and if more detailed followup had occurred.	The LP&L Quality Team has been constituted to allow any individual to express quality concerns on a confidential basis, and be assured of: (1) investigation of the concern, (2) substantiation of the concerns and (3) correction of the concern. The Quality Team program is described in detail in Section II.A.11.
17	The concern might have been avoided if, during the preparation of construction/inspection procedures, more care was taken to explicitly list the characteristics necessary to ensure proper verification of installation in the inspection sections and checklists.	The FSAR and the LP&L QA Manual require that inspection procedures, instructions and checklists contain acceptance and rejection criteria. Prior to implementation, there is an appropriate review to assure that necessary acceptance criteria are adequately transposed from the design disclosure documents to the inspection procedures, instructions and checklists.
18	The two-over-one problems uncovered in the previous inspections were documented on an exception basis. The concern over the adequacy of those inspections could have been avoided by a requirement to ensure adequate and more auditable documentation of the inspections.	Under the operations phase QA Program the Station Modification Package process includes a checklist of all generic criteria to be addressed during the design and verification stage. This process is described in Section II.H.
19	There is no path for groundwater to flow in sufficient quantity to flood the auxiliary building basement and, therefore, no deficiency exists.	N/A

TABLE 2
OPERATIONAL READINESS ASSESSMENT

Issue	PAST Actions Which Could Have Prevented Occurrence (Lessons Learned)	FUTURE Reflection in Operational QA Program
20	This concern could have been avoided if a uniform and conservative standard had been imposed for judging QA/QC personnel qualifications and for documentation of those qualifications.	During the operations phase, LP&L and contractor inspection personnel will be certified to ANSI N45.2.6-1978 and Regulatory Guide 1.58 Rev. 1. Prior to certification a background investigation must be satisfactorily completed documenting a candidate's education and employment experience as described in Section II.D.
21	During the system transfer and testing process, Waterford 3 had several groups with generally discrete responsibilities for identifying and resolving quality related issues. This resulted in the achievement of optimum hardware quality however full understanding of the day-to-day coordination between those groups of the open items and their status could have been enhanced by better documentation and training on that process.	During the operations phase LP&L will retain control and responsibility for new and existing systems. No system transfer outside of LP&L will occur.
22	a. Concerns could have been avoided if records had readily allowed the hierarchy of welder position and process qualifications to be demonstrated for audits and verification of compliance with requirements. b. Recognizing the need to provide clear justification when there are apparent conflicts with code requirements could have avoided this concern.	a. As a result of this issue, LP&L is evaluating the Waterford 3 welding program to identify areas of potential improvement. As part of this evaluation, welder records will be configured to readily allow the hierarchy of welder position and process qualifications to be demonstrated. b. Deviations from applicable codes and standards may not be taken under the operations phase QA Program unless evaluated in accordance with 10CFR50.59.

TABLE 2
OPERATIONAL READINESS ASSESSMENT

Issue	PAST Actions Which Could Have Prevented Occurrence (Lessons Learned)	FUTURE Reflection in Operational QA Program
23	a. This concern could have been avoided by recognizing that delegation to Ebasco of the routine QA auditing overview of Mercury without adequate LP&L involvement inhibited the timely recognition by LP&L of quality problems.	a. LP&L retains and exercises responsibility for the operational phase QA Program. The QA Program of contractors/vendors performing work for Waterford 3 during the operations phase must meet all applicable requirements of the LP&L QA Program (see Section II.G). The Engineering and Systems Development QA Group conducts audits and surveys of off-site contractors, vendors, and quality related suppliers. The Operations QA and Plant Quality Groups conduct on-site audits and surveillances of quality related activities as described in Sections II.F.1 and II.F.2.
	b. More emphasis should have been placed on a QA management overview designed to distinguish generic problem trends and root causes of audit findings from isolated occurrences.	b. Operations QA utilizes a QA Trending Program to identify adverse quality trends and generic quality problems. This is discussed in detail in Section II.B.2.a. The yearly audits schedule is approved by the full Safety Review Committee (SRC). Operations QA audits are reviewed by an SRC Subcommittee and results reported to the full SRC as described in Section II.A.1.
	c. Staffing levels should have been higher.	c. During the operations phase LP&L retains direct control of its QA Program. This resulted in a significant increase in staffing over that employed by LP&L Construction QA. The current staffing levels of selected Waterford 3 groups including the operations phase QA organization is described in Section II.C.

OPERATIONAL PHASE QA PROGRAM ASSESSMENT

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OPERATIONAL PHASE QA PROGRAM ASSESSMENT

The individual responses and the prior discussions in this analysis of "collective significance" establish that, with respect to the 23 issues, the plant as-built is adequate to assure public health and safety during operation. At the same time, the review identified various areas in which the construction phase QA Program could have been improved. While the construction phase is essentially complete, the operations phase will shortly commence. In this light, it is appropriate to review the Waterford 3 operations phase QA Program with a focus on the lessons learned from the 23 issues.

LP&L has established a comprehensive program for quality assurance during the operating phase of Waterford 3. The Nuclear Operations Quality Assurance Program is applied to activities affecting the quality of those items which prevent or mitigate the consequences of postulated accidents which could cause undue risk to public health and safety. Those activities include plant operation, maintenance, repair, modification and refueling.

The QA Program is described in Chapter 17.2 of the Waterford FSAR and in the Quality Assurance Manual. Section I of this assessment provides an overview of the QA Program, not a detailed discussion. In Section II selected aspects of the QA Program will be covered in detail in counterpoint to the issues raised in the 23 NRC concerns.

I. QA Program Overview

A. Organization

LP&L retains and exercises responsibility for the QA Program at Waterford 3. The Senior Vice President Nuclear Operations, who reports to the President of LP&L, is responsible for defining quality assurance policy. Reporting to him are the Plant Manager-Nuclear, Nuclear Services Manager, Project Manager-Nuclear, Corporate Quality Assurance Manager, and the Safety Review Committee (the members of which are appointed by the Senior Vice President Nuclear Operations). The corporate organization for implementation of the QA Program is shown in Figure 17.2-1 of the FSAR.

While quality is a concern of all Nuclear Operations personnel, the Quality Assurance and Plant Quality Groups within Nuclear Operations deserve special mention. The Quality Assurance (QA) organization is responsible for developing, coordinating, and assuring implementation of the LP&L QA Program. Although most quality related activities are performed by personnel outside the QA organization, an overview of the performance of these activities relative to QA Program compliance is accomplished by QA personnel through reviews and audits.

QA is divided into two groups. The Engineering and Systems Development QA Group conducts surveys and audits of contractors and vendors, maintains the Qualified Suppliers List, reviews procurement packages, and conducts surveillance of quality related suppliers. The Nuclear Operations QA Group assures that the QA Program at the site is being effectively implemented.

Operations QA is a relatively new organization. It became a functional quality management tool with its first audit in January, 1982 of the system turnover process. In fact, it was as a direct result of this audit that the problem with Mercury (Issue #23) was first identified and reported to the NRC. Its responsibilities include the audit, monitoring, review and quality trending programs for Waterford 3.

The Plant Quality Department reports to the Plant Manager-Nuclear. This Department has direct responsibility to implement the requirements of the QA Program related to onsite-initiated activities including review, inspection, verification and surveillance requirements.

B. QA Program Scope

As described in the LP&L QA Manual, the QA Program is applied to all quality related areas of plant operation. For safety-related items, all applicable portions of the QA Program (i.e. Appendix B) criteria are applied. The QA Manual also provides a separate section of Special Scope QA Policies, defining application of selected 10CFR50 Appendix B criteria as necessary. Currently, such areas as fire protection, radiological environmental monitoring, the Availability Improvement Program, computer software, radiation protection and emergency preparedness are covered as special scope policies. Special scope policies will be issued to cover additional areas such as security and radioactive waste management.

C. Quality Training

Training is fundamental to quality. As a result, indoctrination and training programs are established for Nuclear Operations personnel performing quality related activities. The programs are designed to ensure that personnel are knowledgeable in quality assurance procedures/requirements and have the necessary proficiency to implement the requirements. The Quality Assurance Section assists with the development and conduct of quality assurance indoctrination and training with the Corporate Quality Assurance Manager reviewing and concurring with the program content.

D. Inspection/Audits

Monitoring of quality program implementation is performed through inspection and surveillances during operation, maintenance, modification, repair, material receiving, and storage activities. Maintenance and modification instruction, and work plans are reviewed by Plant Quality personnel to assure the inclusion of inspection requirements and to verify that methods and acceptance criteria are defined. Inspections are performed by qualified Plant Quality personnel. For quality related activities (e.g. surveillance testing) where direct inspection is not utilized, the Plant Quality Group surveil the activities in accordance with established procedures.

Audits are conducted by the Quality Assurance Section to provide a comprehensive independent verification and evaluation of quality related procedures and activities. Additional audits are performed as required to verify and evaluate supplier and contractor Quality Assurance Programs, procedures, activities, and interface controls.

E. Corrective Action Implementation and Verification

For deficiencies identified by plant staff or identified during the inspection/audit process, multiple means exist to implement corrective action. For each means of deficiency identification there exists a process to implement, track, and verify as complete the appropriate corrective action. Furthermore, through various trending programs the generic significance of individual deficiencies taken as a whole is identified, assessed and corrective action implemented. Such trending programs exist for the areas of programmatic, systematic and hardware deficiencies.

II. Selected Aspects of the Operations QA Program

The 23 NRC issues have dealt with possible quality problems during the construction phase of Waterford 3. During the review of these issues LP&L has identified various lessons learned that, in retrospect, would have led to changes in the construction QA Program. It is natural, therefore, to examine the operational phase QA Program for Waterford 3 in light of the construction phase lessons learned. The discussions which follow are intended to amplify on selected aspects of the operational phase QA Program which reflect incorporation of the major lessons learned from the construction phase. It should be noted that the Operations QA Program was developed independently of the construction QA Program in order to meet the needs of an operating plant. With minor exceptions, the Operations QA Program was not changed as a result of the lessons learned from the 23 NRC concerns, but rather anticipated and already encompassed those areas of concern.

The following discussions are divided into nine major areas:

A. Management Oversight
B. Quality Deficiency Identification and Resolution
C. Staffing
D. Certification of Inspection Personnel
E. Quality Assurance Indoctrination and Training
F. Audit/Review Programs
G. Control of Contractor Quality-Related Activities
H. Station Modification Program
I. Records

A. Management Oversight

Maintaining a high level of quality at an operating nuclear power plant requires continuous management involvement in the QA Program. LP&L management has structured the operational QA Program to ensure management oversight and control of all aspects of quality at Waterford 3.

The Plant Manager, reporting directly to the Senior Vice President Nuclear Operations, is responsible for the primary implementation of quality related measures during the operation activities at Waterford 3. The Senior Vice President Nuclear Operations, the Plant Manager, and other utility executives employ a number of management tools to implement and validate the operational QA Program.

1. Safety Review Committee

The Waterford 3 Safety Review Committee (SRC), of which the Plant Manager is a member, reports directly to the Senior Vice President Nuclear Operations through monthly reports of SRC activities. It is primarily responsible for the management level overview of the operation of the Waterford 3 plant to assure that the plant is operated in accordance with the Technical Specifications and to review significant safety issues.

One of the key functions of the SRC is to review the audit program as defined by the plant Technical Specifications. At Waterford 3 the SRC has established a subcommittee responsible for reviewing all QA audits specified by the Technical Specifications as well as reviewing any special audit or additional audits performed by the QA organization. The SRC Charter requires a minimum of quarterly reviews of the results of the audits performed. As a matter of practice, the audit subcommittee generally has review meetings scheduled concurrent with the monthly meetings of the full SRC. These subcommittee meetings include a review of the results of all audits performed since the last subcommittee meeting. Significant issues raised in these audits are brought to the attention of the full SRC. In addition to reviewing the individual audits and their findings, the subcommittee reviews the schedule of audits as prepared by the Operations QA Group to assure that it is in conformance with the requirements of the Technical Specifications and to ensure that audits are being conducted on a timely basis in accordance with that schedule.

Because the SRC is concerned with an overview of plant operation, and identification and review of significant safety issues, the SRC review of the operational QA audits serves to provide an additional review of root cause, generic implications, and safety significance of the findings in those audits. In addition, the SRC receives regular reports by the Corporate Quality Assurance Manager of significant issues and occurrences in the QA area. The combination of an overview of the QA program and the QA audit findings provides an opportunity to assess the quality of the audits in determining and evaluating QA issues at a management level.

2. Yearly Management Audits of the QA Program

Audits of the Quality Assurance Program are conducted as specified in the QA Manual, Chapter 18.7, and in the FSAR, Section 17.2. These audits are currently scheduled in accordance with QA procedure QASP 18.12.

Management audits are conducted by an independent audit team from the Middle South Services Quality Assurance group. Members of the audit team are qualified to appropriate standards. The review topics cover all activities associated with the administration and execution of LP&L's QA Program. Findings are reported to the Senior Vice-President level and assigned to the appropriate LP&L QA managers for corrective action. Findings are tracked using approved procedures and forms. Audit findings are reviewed for underlying causes to determine corrective action to prevent recurrence. Those deficiencies requiring long term action to correct, or which have the potential for recurrence, are reinspected in follow-on management audits to determine the effectiveness in addressing identified problems

It is anticipated that the yearly management audit of the QA Program will be an effective management tool in assessing and maintaining the adequacy and effectiveness of the operations phase QA Program.

3. QA Trending Program Quarterly Reports

The Operations QA Group administers a QA Trending Program intended to identify adverse programmatic quality trends and initiate corrective action. While other mechanisms exist to identify and correct individual quality concerns, the QA Trending Program will allow management a tool to identify underlying "common mode" sources of quality deficiencies. The QA Trending Program is described in detail in Section II.B.2.a.

Trend analysis reports will be issued quarterly by the Corporate QA Manager to the Safety Review Committee and the Senior Vice President Nuclear Operations. It is expected that the QA Trending Program will prove a valuable senior management tool for assessing and controlling the level of quality at Waterford 3.

4. Quality Assurance Program Status Summaries

Summaries of QA Program activities at Waterford 3 are provided to the Senior Vice President Nuclear Operations on a weekly and monthly basis.

a) Weekly Report - provides a status as of the last day of the week reviewed for various QA Program subjects of interest which include Audits & Reviews, NRC Site Activities, and QA Training. These reports are posted in all QA office locations.

b) Monthly Report - presented to the Chief Executive Officer and Senior Vice President Nuclear Operations during the monthly Program Review meeting. It provides a summary of site-related QA activities similar to the weekly report and includes statistical studies where applicable.

5. Plant Operations Review Committee

The function of the Plant Operations Review Committee (PORC) is to advise the Plant Manager on all matters related to nuclear safety. In fulfilling this function the PORC reviews, among others, plant procedures that affect the public health and safety, proposed hardware modifications that affect nuclear safety and all reportable events. The PORC provides the Plant Manager, prior to implementation, with written recommendations and 10CFR50.59 safety evaluations with respect to the acceptability of procedural and hardware changes. The minutes of each PORC meeting, documenting the results of all PORC activities performed under the provisions of the Technical Specifications, are provided to the Plant Manager, Senior Vice President Nuclear Operations, and the Safety Review Committee.

6. Quality Inspection Activities Status Reports

The Plant Quality Department will provide quarterly reports to the Plant Manager-Nuclear. Included in the reporting is an analysis of quality trends with respect to deficiencies identified during processing of Discrepancy Notices, Quality Notices, and Plant Quality Department reviews/inspections of CIWAs, procedures and procurement documents. Reporting in this area has recently commenced. The frequency, format, and categories reported in the Quality Inspection Activities Status Reports are expected to change to fulfill the needs of the Plant Manager in detecting adverse trends in quality related activities on site.

7. Licensee Event Reports

LP&L has established a permanent onsite Event Evaluation Committee (EEC) for the purpose of coordinating the evaluation, reporting and closure of corrective actions associated with reportable events described in 10CFR50.73. The EEC is responsible to the Plant Operations Review Committee (PORC) and the Plant Manager.

Any individual identifying a reactor trip, transient, safety related equipment failure or malfunction, radiological event, security event, violation of a technical specification, or other events deemed to be potentially reportable, are responsible for initiating a potential reportable event (PRE) report. Following any necessary immediate corrective actions and/or modifications, the EEC ensures that a prompt, thorough PRE investigation is conducted. During the investigation, the cause of the event is identified and corrective action initiated to prevent recurrence. Generally, corrective action is documented and tracked via one of the deficiency identification mechanisms discussed in Section II.B.1.a-e. In addition to the standard closure verification processes, the EEC independently tracks and confirms adequacy of corrective action.

The EEC provides the PORC with a report of the completed investigation and recommendations. Following PORC review the Plant Manager is responsible for approving disposition of PREs as Licensee Event Reports for transmittal to the NRC.

8. Availability Improvement Program Reports

The Availability Improvement Program (AIP) is currently under development by LP&L for implementation during the operations phase at Waterford 3. Quality related problems, as described later in this submittal, will be periodically reported to senior management. Whereas the QA Trending Program will provide management input as to adverse programmatic trends, the AIP will provide adverse trend information on the system/hardware level.

9. Independent Safety Engineering Group

One of the functions of the Independent Safety Engineering Group (ISEG) is to prepare and conduct independent reviews of plant activities which may result in recommendations to plant staff and corporate management. These recommendations include corrective actions such as procedure revisions, equipment modifications and additional training necessary for improving overall quality assurance and plant safety. Evaluations of plant operations, maintenance and modification are documented through ISEG reports. These reports, as well as any action item resulting from them are logged by the ISEG group for purposes of tracking and resolution. To keep management appraised of ISEG activities, an ISEG Monthly Summary is provided to the Senior Vice President Nuclear Operations and the Engineering and Nuclear Safety Manager listing evaluations performed that month and areas of ongoing review.

10. Operations Assessment and Information Dissemination Group

The Operations Assessment and Information Dissemination Group (OA&ID) is responsible to the Nuclear Safety Supervisor for screening, evaluating, and disseminating operational experience information. A significant management overview function that the OA&ID group will provide is the detailed evaluation of selected LP&L Licensee Event Reports (LERs). This evaluation will explore generic implications or special aspects of the event which are outside the scope of normal LER evaluation and review. Periodic status reports will be provided to management.

11. Quality Team

The LP&L Quality Team offers concerned individuals the opportunity to voice quality concerns on a confidential basis. Reporting directly to the Senior Vice President Nuclear Operations, the Quality Team has been empowered with the authority to conduct investigations of any quality concerns brought to their attention; investigate instances of intimidation and harassment of individuals providing information to the Quality Team; and maintain strict independence and confidentiality. Following preparatory work the Quality Team was staffed and began full operation at the beginning of August, 1984.

The Team acquires quality concern information through the following methods:

a. Local and toll free hotline telephones are established to receive quality concern calls. The numbers are published widely to project personnel. Quality Team personnel man the phones during working hours, while calls are recorded at other times.

b. All personnel terminating employment from Waterford 3 exit through Quality Team headquarters. Personnel are afforded the opportunity to express quality concerns on a confidential basis. Any individuals who terminate employment off site or during other than working hours are sent a letter requesting any quality concerns they may have.

c. All Waterford 3 personnel can "walk in" the Quality Team headquarters at any time to discuss quality concerns.

d. Concerns received by the Quality Team from sources external to Waterford 3 are documented and processed in the same manner as internal concerns.

e. The Quality Team is re-evaluating all interviews conducted prior to the present Team configuration (see NRC Concern #16).

Regardless of how the quality concern was identified, each is addressed in the same manner. An initial review is conducted for reportability and safety significance requiring immediate corrective action. An Investigative Plan, intended to resolve each concern identified, is then developed and a Quality Team investigator assigned for completion. Once the investigative actions are completed and the concern is resolved all documentation is retained as an auditable file. The specific procedural steps are contained in QASP 19.11, "Quality Team Operating Procedure".

Substantiated quality concerns are documented for corrective action and verification on a Quality Team Deficiency Report (QTDR). The QTDR is very similar in form and handling to the Corrective Action Report (CAR) discussed in Section II.B.1.d. The Quality Team reviews the results of implementing the QTDR findings and, where the corrective action is unsatisfactory and/or attempts at resolution have been unacceptable, the Quality Team notifies the Senior Vice President Nuclear Operations by letter requesting resolution and action(s) to prevent recurrence. Final reports for all concerns are directed to the Senior Vice President Nuclear Operations with copies to appropriate senior managers.

The Quality Team is committed to investigate concerns in a manner that focuses on determining root cause and complete implementation of corrective action. To support root cause determination the Quality Team maintains a trending program categorized by type of quality concern (e.g. unqualified personnel, inadequate training) and means of identification (e.g. hotline, "walk-in"). The basic elements of the trending program center around data retrievability and sorting to suit management needs. The key attributes are:

a. Concern categorization and coding
b. Statistical data gathering
c. Evaluation and analysis.

The Senior Vice President Nuclear Operations, and other appropriate senior management, are provided with timely Quality Team information to assist in their assessment of the status of the QA Program. The Quality Team transmits, among others, the following reports:

a. Weekly Status Report of the Quality Team Program Activities
b. Quality Team Monthly Status Report
c. Quality Team Deficiency Trends Status Report (weekly)

B. Quality Deficiency Identification and Resolution

In maintaining and improving quality a comprehensive program must exist to identify and correct quality deficiencies. Two components are important for successful implementation of such a program. First, sufficient means and opportunity should be available to identify and correct individual quality concerns as they occur. Secondly, a capability should exist to assess the identified deficiencies as a whole to determine whether they are isolated occurrences or due to underlying common causes. The LP&L QA Program incorporates provisions for both components of quality deficiency identification.

1. Isolated Quality Deficiencies

LP&L employs a hierarchical system for identification of individual quality deficiencies. At the first level of the hierarchy it is intended that adverse quality conditions will be identified by plant staff using CIWAs (Condition Identification and Work Authorization), DNs (Discrepancy Notices) and QNs (Quality Notices). The second level of detection includes CARs (Corrective Action Request) and AFRs (Audit Finding Reports) issued by the Operations QA Group during monitoring and audits. Finally, at the third level are NRC Inspection Reports.

Upon identification of the quality problem, specific action is necessary for effective resolution: 1) cause is identified either explicitly or as part of the trending program, 2) appropriate corrective action is implemented, 3) a means of tracking the deficiency and corrective action(s) to completion is available, and 4) verification of completion and effectiveness of corrective action is documented. These steps are included for the deficiency identification mechanisms at Waterford 3 and are described in the discussions which follow.

a. CIWAs

PURPOSE: The Condition Identification and Work Authorization (CIWA) is the primary vehicle through which abnormal plant conditions are identified, evaluated and corrected, as well as the means for implementing routine maintenance.

ORIGINATION: If, during the course of inspection, testing or operation, a condition adverse to quality is identified by any Waterford 3 personnel, it is required that a CIWA be generated. Routine maintenance must also be performed via a CIWA.

CORRECTIVE ACTION IMPLEMENTATION: Except in cases requiring immediate attention, corrective maintenance may not commence without a processed CIWA in accordance with UNT-5-002. Any maintenance or adverse quality condition involving the basic power plant is forwarded to the Control Room Supervisor (CRS)/Shift Supervisor (SS) for review. The CIWA is then forwarded to Planning and Scheduling Department (P&S) for evaluation, dispositioning and work planning. CIWAs are evaluated as nonconformances when the adverse quality condition is determined to be a departure from specified requirements and, (1) is not the result of normal wear or, (2) is not a secondary effect due to failure of another component, or (3) is not identified as a routine part of the work process and will be corrected as a continuing part of the work process, or (4) is dispositioned as "repair" or "use-as-is", or (5) is a suspected generic problem. If the CIWA is dispositioned as "repair" or "use-as-is", it must obtain concurrence from Plant Engineering. Plant Engineering performs a technical evaluation in such cases (including a Safety Evaluation, if necessary) to determine cause and corrective action and documents the results on the CIWA. If a design change is necessary, a Station Modification Request number is entered on the CIWA. When the CIWA has been dispositioned, a copy is forwarded to On-Site Licensing for a 10CFR21 evaluation.

The CIWA is then processed as a work package by the appropriate discipline. The CIWA work package is reviewed and approved prior to commencement of work by the responsible Maintenance Supervisor and Plant Quality Group (for quality related work packages) to ensure inclusion of accurate and complete work instructions and/or inspection Hold Points. Subsequent changes which change the scope of work or acceptance criteria are reviewed by the same review organizations.

Upon completion of work, the responsible department Supervisor reviews the work package for completeness and forwards the CIWA work package to P&S for closure on the MTS (Master Tracking System). The MTS identifies all archived and active CIWAs at the plant site. Tight administrative controls are instituted to assure proper input and extraction of data to/from the MTS.

CORRECTIVE ACTION VERIFICATION: Post closure review by the Plant Quality Group and Plant Engineering consists of an overall review of the adequacy of the CIWA and corrective action. All CIWAs identified as Non-Conformance are periodically analyzed by Operations QA for adverse quality trends. The Nuclear Safety Section of the Project Management Department also provides an independent review of non-conformances, dispositions, and close-outs.

b. DNs

PURPOSE: The Discrepancy Notice (DN) is the mechanism through which discrepancies are identified during receipt inspections of quality related parts, material, and components by LP&L Plant Quality personnel at Waterford 3.

ORIGINATION: Upon receipt of quality related items, Stores personnel notify the Plant Quality Group and initiate a Material Receipt Inspection Report. For those items specified in the procurement package as requiring tailored or Special Receipt Instructions, a "Special Receipt Instruction Sheet" will be initiated by Plant Quality personnel. The inspector examines incoming materials in accordance with approved inspection instructions. In the event a discrepancy is identified during the inspection, a DN is issued by Plant Quality which maintains a log and status of all DNs. The DN is also forwarded to Licensing for 10CFR21 evaluation.

CORRECTIVE ACTION IMPLEMENTATION: A "hold tag" is attached to the discrepant item(s) inspected which is then placed in a segregated area. A Material Review Board (MRB) exists to ensure proper disposition of discrepant material. Representatives to the MRB, which is chaired by the Plant Quality Manager, include personnel from Maintenance, Plant Engineering and Purchasing. Upon completion of review and concurrence with the final disposition, members of the MRB sign and date the DN. If the discrepancy can be corrected after installation, the item may be released for installation on a "Conditional Release" (CR) basis subsequent to approval of the "Request for Conditional Release" (RCR). Once the RCR is approved and granted, the CR is sequentially numbered and logged in the CR Log and stated as such on the CR tag and the RCR. The "hold tag" will be removed from the item in exchange for a "CR tag". The original RCR stays with the DN and a copy is attached to the CIWA with special instructions (limitations) for installation. Conditionally released items may not be placed in-service until the DN is satisfactorily closed. Closure of the CR is a pre-condition for closure of the DN. In those cases where a design change was necessary to close the CR, a Plant Engineering representative has joint approval responsibility.

CORRECTIVE ACTION VERIFICATION: The Plant Quality Manager is ultimately responsible for approval of DNs through inspection/reinspection, as applicable. DNs are periodically analyzed by the Operations QA Group for quality trends. The Nuclear Safety Section of the Project Management Department will also provide an independent review of non-conformances (DNs), dispositions, and close-outs.

c. QNs

PURPOSE: Conditions adverse to quality which are due to a lack of, or a breakdown in, administrative controls are documented with a Quality Notice (QN). This document identifies non-conformances indicating a breakdown or substantial departure from required procedures or instructions to the extent that a loss of control is evident.

ORIGINATION: Any Waterford 3 employee may initiate a QN and request a sequential number from Plant Quality who maintains the log and status of each QN. Within 30 days of the identification of a QN, the responsible department is required to report the actions taken or proposed to cover the following:

a) the cause of the condition,
b) correction of the conditions identified,
c) action to prevent recurrence, and
d) schedule of implementation.

CORRECTIVE ACTION VERIFICATION: The Plant Quality Group is responsible for verification of corrective actions committed to in the 30-day response supplied by the affected discipline(s). The Licensing Group reviews QNs for reportability under 10CFR21. QNs are periodically analyzed by the Operations QA Group for quality trends. The Onsite Safety Review Subgroup of the Project Management Department provides an independent review of non-conformances, dispositions and close-outs.

d. CARs

PURPOSE: The purpose of a Corrective Action Request (CAR) is to provide a mechanism through which the Operations QA Group can document deficiencies based on monitoring of plant activities or conditions, and present such findings to the affected Manager for a timely and effective resolution of the concern.

ORIGINATION: A CAR originates as the result of monitoring or observation of a quality affecting activity or condition which could be detrimental to the safe operation of the plant and/or safety of personnel. QA personnel assess the cause and significance of the deficiency to determine if an immediate corrective action is required. Where such a determination is made, a "Stop Work Order" may be initiated, or other steps taken for immediate implementation. The CAR includes a description of the identified deficiency, and a requirement that corrective action, underlying cause and action to preclude recurrence be documented by the responding organization.

CORRECTIVE ACTION IMPLEMENTATION: The delivery date of the CAR to the affected organization is the start of the 30-day period during which the cognizant group must resolve the deficiency, or define steps to be taken to effect resolution and provide a schedule for completion.

CORRECTIVE ACTION VERIFICATION: If the resolution and corrective action are considered acceptable, the QA Representative indicates so on the CAR and recommends approval and closeout of the CAR. The original CAR is given to the applicable QA Supervisor for final approval and filing. If the resolution and corrective action are not considered applicable, the cognizant Group Head will be so informed and a schedule arranged for satisfactory disposition. The action taken will be filed in the Open CAR File. If corrective action and the schedule for resolution are acceptable, but such action has not yet been taken, the QA Representative may accept the proposed resolution on the original CAR and maintain it in the Open CAR File. After satisfactory resolution and closeout, as attested to by the applicable QA Supervisor's signature, the original CAR will be maintained.

e. AFRs

PURPOSE: The Audit Finding Report (AFR) is the Operations QA mechanism for documenting deficiencies identified during audits of organizations performing quality related activities at Waterford 3. These AFRs are then forwarded to appropriate levels of management.

ORIGINATION: An audit is structured around a checklist prepared by the auditor and concurred with by the supervisor. The checklist is used during the audit to compare the audited organization's mode of operation against procedures, standards and other documents which govern its domain of operation.

CORRECTIVE ACTION IMPLEMENTATION: The audited organization is required to complete the following actions upon receipt of the audit report:

a) Review and investigate the condition described in each audit finding.
b) Schedule appropriate immediate corrective action to correct the deficiency and to prevent recurrence, and
c) Respond to all findings within (30) days after acknowledging the audit finding. The response must clearly state the corrective action implemented and/or the scheduled date targeted for the completion.

CORRECTIVE ACTION VERIFICATION: The QA Audit Supervisor assures that corrective action is being accomplished in a timely manner by maintaining a tracking system of all unresolved items. The Lead Auditor confirms through personal observation or verification, that corrective action is accomplished as scheduled. The verification review also assures that the corrective action is adequately identified and implemented for each finding, including considerations for:

a) Similar conditions
b) Corrections as to cause
c) Software aspects
d) Hardware aspects
e) Schedule
f) Completeness

f. NRC Inspection Reports

ORIGINATION: These reports are transmitted to LP&L by the NRC Region IV office. A summary of NRC inspected areas of operations, maintenance, administrative controls, and license activities are contained therein and may identify open items, unresolved items, and/or Violations/Deviations.

CORRECTIVE ACTION IMPLEMENTATION: The Nuclear Services Manager and the Nuclear Support and Licensing Manager are responsible for the coordination of reviews and preparation of responses to NRC Inspection Reports. This task is performed by the Onsite Licensing Unit of the Licensing Section.

The specific task is performed by the Licensing Engineer (LE) through the development of a Licensing Action Plan (LAP). This plan may necessitate input from other departments and is transmitted to them through the use of a Licensing Information Request (LIR) form. The LIR is responded to and certified by the respective departments via the Task Review And Certification (TRAC) form. The response is reviewed by the LE for consistency with the LAP, LP&L commitments, completeness and the FSAR. Inspection Report responses are reviewed by the Plant Manager, Licensing Manager, and the Nuclear Support and Licensing Manager prior to transmittal to the NRC.

CORRECTIVE ACTION VERIFICATION: This is accomplished through receipt of signed off TRAC forms from responsible departments as well as a confirmatory review by the LE. LIRs are tracked from inception through completion by the LE via the computerized Licensing Commitment Tracking System. Responses to the NRC pertaining to Inspection Reports and 10CFR21 are further validated by the Operations QA group via QASP 19.13 prior to transmittal to the NRC.

2. Generic Quality Deficiencies

There may be cases where correcting individual quality deficiencies is insufficient to assure overall quality. Such cases occur where there are underlying causes common to more than one deficiency. Therefore, LP&L has established programs to provide timely identification and correction for such generic deficiencies. The following three sections will discuss the QA Trending Program, the Availability Improvement Program, and Hardware Trending.

a. QA Trending Program

Recognizing the need for early identification and correction of generic quality problems the Operations QA Group initiated a Quality Trending Program in May, 1984 with the publication of procedure QASP 16.1.

Data Reduction

The Operations QA Group collects and analyzes quality data for the purpose of identifying adverse trends. Responsible organizations initiate corrective action for Waterford 3 programmatic deficiencies.

Documents to be incorporated into the trend analysis include, but are not limited to:

CIWAs (Condition Identification and Work Authorizations)
QNs (Quality Notices)
DNs (Discrepancy Notices)
AFRs (Audit Finding Reports)
CARs (Corrective Action Reports)
NRC Inspection Reports

For each document the assigned QA representative will review and identify any deficiency in the effectiveness of the QA Program. The identified deficiency will then be categorized according to the following scheme:

Equipment Control
Training and Qualification
Design Control
Maintenance and Modification Control
Procedure Adherence
Plant Records Management
Control of Purchased Materials and Services
Identification and Control of Materials, Parts and Components

Control of Special Processes
Inspection
Test Control
Control of Measurement and Test Equipment
Surveillance Testing and Inspection Schedule
Plant Security
Corrective Action

As experience is gained in the trending program, categories will be added and deleted as necessary.

Trend Analysis

The Operations QA representative will evaluate the trend reports to determine if a possible adverse trend exists based on the following:

a. A significant increase in the number of occurrences of a specific adverse condition category is noted as compared to the previous reporting period.

b. A continuing and significant rise in the overall trend of adverse conditions for a responsible organization over the last three months is noted.

Further investigation to confirm possible adverse trends may be indicated and accomplished by monitoring the specific activity or program in question.

Corrective Action

Corrective action will generally be in the form of issuance of a Corrective Action Request (CAR) to the Manager of the responsible organization. Future trending reports will be used (in addition to standard QA confirmatory actions) to verify the adequacy of the corrective actions.

Reporting

The trend analysis report will be issued on a quarterly basis in the form of graphs and summary reports (including summaries of CARs and corrective actions) to the Safety Review Committee and to the Senior Vice President Nuclear Operations through the Corporate QA Manager. The reports will be formatted in a manner to facilitate the identification of trends in programmatic deficiencies.

Management Overview

The trending program provides a valuable senior management tool for assessing the effectiveness of the quality program at Waterford 3. Trends whose root cause may lie in the areas of staffing, corporate philosophy, management deficiencies, and the like, can most appropriately be resolved through the Senior Vice President Nuclear Operations following his quarterly review of the trending reports.

Current Status

The trending program has been recently initiated at Waterford 3 with the first quarterly report to the Senior Vice President issued in October, 1984.

b. Availability Improvement Program

The Availability Improvement Program (AIP) for Waterford 3 will be implemented to improve overall plant reliability. In so doing, quality related problems will be identified to management and corrective action implemented on a system/component level. While the QA Trending Program will identify generic programmatic deficiencies, it is expected that problems identified by the AIP will be predominately in the hardware area.

The AIP centers around a computerized model of the Waterford 3 plant. The plant will be divided into generic functions, which will be further subdivided into subfunctions, equipment systems, and, finally, equipment items. The model database will be regularly updated to reflect actual plant performance data, enabling the calculation of reliability/availability for any hierarchical level of the computer model. Availability goals will be set initially based upon industry performance of similar plants. As the AIP proceeds, and the database is extended, plant-specific availability goals will be utilized.

When an unusual characteristic affecting some measurement of availability is identified, or a problem is recommended for investigation, a Unit Availability Investigation (UAI) will be undertaken. The UAI will focus on a group, or individual piece, of hardware as appropriate. A root cause analysis will be performed to determine the reasons for abnormal performance. The analysis may make use of plant personnel interviews, vendor interviews, consultant interviews, investigation of environmental conditions, special testing, etc.

Upon determination of the root cause of the problem, corrective action will be implemented as necessary and tracked to completion. Verification of effectiveness of the corrective action will be evidenced through improved availability performance under the AIP.

Periodic reports of the results of the AIP will be provided to Nuclear Operations management, including the Senior Vice-President Nuclear Operations. Such reports will identify adverse availability trends, the root cause of such trends, corrective action taken, and confirmation of effectiveness of the corrective action.

As with any trending program, an operational database is required prior to effective implementation of the AIP. LP&L expects the AIP to be fully implemented within two years.

c. Hardware Trending

The purpose of the Maintenance History System (MHS) is to identify potential improvements in the preventive maintenance program, to suggest improvements to corrective maintenance procedures, to identify equipment requiring upgrade, and to provide a tool for assessing adequacy of spare part inventory levels. After completion of a plant modification, repair or maintenance, a MHS form is filled out on the affected component describing the nature of the work performed. The MHS form is attached to the CIWA before routing for closure review. These forms are used for data entry into the MHS computer system. The MHS data base is currently under extensive review to update and verify accuracy and adequacy of input data. This data base will provide a complete preventive and corrective maintenance history of all plant system components. This will enable LP&L managers to detect equipment trends in systems under their control. Once operating time is accumulated on plant systems the Plant Maintenance Superintendent will select key systems to review the frequency and scope of preventive maintenance for changes as necessary to improve system operability.

Pump and valve testing performed under the requirements of the ASME Boiler and Pressure Vessel Code is another source of trending information. A list of Section XI tests performed on safety related equipment under this Code for which data must be recorded to identify failure trends has been established at Waterford 3. This list includes such equipment as the Emergency Diesel Generator, Charging Pump, Containment Spray Pump, Reactor Coolant System (RCS) Pumps, RCS Instrumentation, MSIVs and containment isolation boundary valves. This trend information will provide plant management with advance notice sufficient to take the necessary corrective actions to prevent failure of such equipment vital to nuclear safety.

In programs of this magnitude it is inevitable that changes will be necessary. As LP&L gains more experience in quality trending, program refinements will be made to support the program purpose of identifying adverse quality trends. It is also important to note that the effectiveness of any trending program is a direct function of its database. The identification of trends requires a detailed previous history. By initiating the trending program at this time LP&L expects it to become a useful management tool going into commercial operation.

C. Staffing

The organization, staffing levels and personnel qualifications for Waterford 3 are described in Chapter 13.1 of the FSAR. Staffing of key areas of plant operations and quality include:

Staff	Authorized Staffing Level	Actual Level as of 9/84
Plant Operations and Maintenance	211	191
Plant Technical Services	96	92
Plant Training	31	28
Plant Quality	13	13
Quality Assurance	46	42

The operations phase QA organization is divided into two main groups - Nuclear Operations QA and Engineering/System Development QA each of which is further subdivided into 3 sections. QA staffing for the operations phase is detailed below:

Staff	Authorized Staffing Level
Nuclear Operations QA Manager	1
- QA Audits	9
- QA Support	6
- QA Analysis	9
- Total	25
Engineering/System Development QA Manager	1
- Audit/Surveillance	5
- System Development	7
- Engineering/Procurement	4
- Total	17
QA Management	4

D. Certification of Inspection Personnel

Inspection personnel during the operations phase of Waterford 3 including those provided by contractors are certified in accordance with QI-10-001, "Qualifications of Inspection Personnel". Certification for Level I, II and III qualifications is done in accordance with ANSI N45.2.6-1978, and Regulatory Guide 1.58 Rev. 1. Prior to certification a background investigation must be satisfactorily completed verifying a candidate's education and employment experience. Recertification is performed every two years.

E. Quality Assurance Indoctrination and Training

1. Plant Staff Quality Related Training

An indoctrination and training program has been established for the Nuclear Operations Department personnel performing quality related activities. It is designed to ensure that personnel involved are knowledgeable in quality assurance procedures/requirements as well as the overall functional responsibilities in the plant, and have the necessary proficiency to implement the requirements. The scope, objective, and method of implementing the indoctrination and training program are documented in procedures developed by the Training Department. The Quality Assurance Training and Indoctrination Program requires that:

a) Personnel responsible for performing activities that affect quality are instructed on the purpose, scope, and implementation of quality related manuals, instructions, and procedures;

b) Personnel performing activities that affect quality are trained and qualified in the principles, techniques, and requirements of the activity being performed;

c) Proficiency and requalification of personnel performing activities requiring certification are maintained by retraining, re-examination, and/or recertification on a periodic basis;

d) Proficiency tests be given to those personnel performing and verifying activities affecting quality, and acceptance criteria developed to determine if individuals are properly trained and qualified;

e) Certificates of qualification clearly delineate (1) the specific functions personnel are qualified to perform and (2) the criteria used to qualify personnel in each function; and

f) Documentation concerning training and qualification programs which describes the content, who attended, and results of tests as required by the training program are maintained.

2. Quality Assurance Section Training

QA Procedure QASP 2.10 directs the development, implementation and documentation of the QA Section training program to reasonably assure that LP&L QA personnel have sufficient knowledge and experience to perform assigned tasks at Waterford 3. Training is implemented through:

- Completion of a QA required reading list;

- Formal classroom training (onsite and offsite) in specific topical and procedural areas to enable and enhance performance and effectiveness;

- Performance of on-the-job training assignments by individuals at their supervisor's discretion where formal courses cannot provide the level of training necessary for a particular quality related task;

- Special training where unique skills are needed for performance of specific functions such as monitoring of NDE, welding and fire protection;

- Periodic training such as the monthly QA Section training sessions or group sessions on an as-needed basis where changes, revisions or new requirements from LP&L QA Program documents, regulatory codes and standards are brought to the attention of QA personnel. Lessons learned or corrective actions as a result of quality deficiencies or undesirable programmatic trends identified at Waterford 3 and other nuclear generating facilities will be reviewed during these sessions.

The Quality Assurance Section Training Committee was formed on 12/16/83 to review the goals, objectives, effectiveness, and implementation of the training program for the Quality Assurance Section. It is composed of supervisory members from Engineering/Systems Development, Nuclear Operations, and Nuclear Construction QA Groups to act as a steering committee to provide management with an overview for evaluating the effectiveness and future direction of the QA Training Program.

An evaluation of the 1983 QA Training Program by this "ad hoc" group stressed three areas of concern for additional improvement: presentation and preparation of training lessons, attendance, and attitude and participation during training. As part of an effort to remain innovative and improve the skills of QA personnel two new training formats emphasizing professional development and corporate awareness were introduced. Under professional development, college professors and outside consultants provide instruction in stress management, leadership, oral communication, technical writing, time management, problem solving and negotiating skills. To enhance corporate awareness, representatives from various organizations within LP&L and the Middle South System will occasionally present their group's workscope to provide better understanding among QA personnel of company operations.

The success achieved by the Quality Assurance Section in meeting their training goals is evidenced in a Good Practice noted by INPO during a recent corporate assistance visit (December 1983). While evaluating senior corporate management attention and support of programs for developing experienced, trained, and qualified personnel required for the operation and support of Waterford 3, INPO stated in Good Practice 2.5A-1:

> "An excellent continuing professional training program has been developed for the Nuclear Operations Quality Assurance Group. This program is intended to enhance the inspecting, interviewing, and general management skills of QA personnel and has been well received by QA personnel."

3. Contractor Training

Contractors supplying quality related services to LP&L for which they conduct their own quality inspection and surveillance functions, are responsible for training their inspection personnel and documenting their qualifications under their own QA programs. These programs must meet or exceed the requirements of LP&L's QA Program, including training, before such vendors can be placed on the Qualified Suppliers List and enter into contract agreements with LP&L. QA program assessments of QSL vendors are made through Annual Evaluations and Triennial Audits (refer to Section II.G.1). Additionally, whenever contract personnel are performing quality related work onsite, implementation audits of vendor activities are conducted by Operations QA personnel (refer to Section II.G.3).

Contract personnel who perform quality related work under LP&L's QA Program must be trained in accordance with LP&L Procedures. LP&L managers directly supervising these personnel are responsible for ensuring they receive the proper QA training. Contract personnel performing inspection and monitoring functions are periodically evaluated by LP&L. Evaluation documentation is retained in individual training files in LP&L Project Files.

F. Audit/Review Programs

1. Nuclear Operations QA Audit/Monitoring Programs

a. Audit Program

As part of its charter to assure that the QA Program at Waterford 3 is adequate and being effectively implemented, the Operations QA Group administers an audit program of on-site quality related activities.

The QA Audit Supervisor, within the Operations QA Group, maintains a yearly audit schedule. Audit subject and frequency are based upon 10CFR50 Appendix B, the LP&L QA Manual, Technical Specification 6.5.2.8, Regulatory Guide 1.33, Rev. 2-1978, paragraph C.4, and Regulatory Guide 1.144, Rev.-1980, paragraph C.3. These documents establish minimum requirements which are generally exceeded. For instance, whereas the Technical Specifications require audits of Appendix B criteria to be conducted at least once per 24 months, such audits are presently scheduled on a yearly basis.

The annual audit schedule is updated every six months to incorporate any changes since the previously issued schedule. For example, when an unscheduled audit is performed it is added to the schedule as a record of the audit having been performed.

In revising the schedule, the QA Audit Supervisor considers the need for redirection of auditing efforts in response to problems identified as a result of the audit program, regulatory inspection findings, Site QA Reviews, Safety Review Committee direction, etc. Regularly scheduled audits are supplemented by scheduling additional audits for reasons such as:

a. Significant changes are made in functional areas of the QA Program such as significant reorganization or procedure revisions;

b. A systematic, independent assessment of program effectiveness is considered necessary; or

c. Verification of implementation of required corrective action is necessary.

The Corrective Action Audit, which is performed twice annually, includes items of noncompliance previously identified to the NRC between the two preceding Corrective Action Audits. Those items are also included within the audit checklist of the Corrective Action Audit conducted one year later to ensure that the corrective action for those items remains in compliance with commitments made to the NRC.

The overall scheduling and audit of unit activities is performed under the management cognizance of the Safety Review Committee (SRC) as previously described in Section II.A.1. In addition to periodic reports of audit activities from the SRC, the Senior Vice President Nuclear Operations receives the audit reports within 30 days of completion of the audit by Operations QA.

The audit process is described in detail in QA Procedure QASP 18.10 "Conduct of On-Site Internal and External Nuclear Operations Quality Assurance Audits".

b. Monitoring Program

Monitoring of plant activities is carried out by the Operations QA Group in order to provide additional observation of various aspects of plant quality related activities.

Monitoring may be initiated for a variety of reasons. For example, the QA Trending Program may identify an adverse quality trend; audit personnel may note a potential quality problem area outside the scope of their audit; or, during the course of review of CIWAs or procurement documents, QA personnel may identify areas of questionable quality.

Deficiencies identified during monitoring activities are documented through the use of a Corrective Action Report (CAR). The origination, tracking and verification of corrective actions for CARs has been previously described in Section II.B.1.d. The overall monitoring process is covered in QA Procedure QASP 18.9 "Conduct of Nuclear Operations Quality Assurance Monitoring of Quality Activities".

2. Plant Quality Group Review and Verification Process

The Plant Quality Group has responsibility to review and verify implementation of the quality requirements related to Waterford 3 on-site activities.

a. Plant Quality Inspection

Quality inspections are performed at designated inspection Hold Points. Quality and Technical Reviews are performed by the responsible department head and Plant Quality Group on all quality related maintenance, modification and testing procedures and work packages. This review ensures that the procedure or work package addresses applicable NRC requirements, Technical Specifications, applicable quality requirements and commitments made to the NRC. As a result of these reviews, Hold Points are designated in the procedure/work package, during which a Plant Quality Inspector:

1) Ensures necessary test and inspection equipment is properly calibrated before use,

2) Checks that the procedure is applicable to the work being performed,

3) Performs inspection in accordance with the work procedure,

4) Reinspects items found unacceptable during previous inspection,

5) Documents the results on the work instructions, attached data sheets or Quality Inspection Report, and

6) Writes or directs a CIWA be written to correct an unacceptable condition unless the item can be reworked.

Completed work packages/CIWAs are reviewed by the Plant Quality Group to ensure that inspections/verifications were properly performed and documented. In the unlikely case that an inspection required by an established Hold Point is missed or not documented, then a Quality Notice (QN) is initiated. The work package will remain incomplete until the QN is verified as closed by rescheduling and completing the inspection, or producing valid documentation of the inspection, or obtaining approval to delete the Hold Point.

b. Hold Points

Inspection Hold Points are required whenever there is a reasonable possibility that an undetected deviation could occur that affects plant safety. In determining probability for an undetected deviation, post-maintenance testibility, complexity, criticality, and uniqueness of the work being performed are considered. Information concerning Inspection Hold Points is obtained from related design drawings, specifications, codes, standards and controlled documents.

The following are examples of activities which would normally require Inspection Hold Points:

1) Activities which could affect the integrity of the reactor coolant pressure boundary of safety/quality related components (e.g., installation and/or setting of pipe or component hangers; bolt-up and torquing of closure studs; installation of locking devices; welding, including fit-up and welding/welder qualifications; heat treatment; and hydrostatic testing.)

2) Nondestructive examination.

3) Cleanliness and foreign material exclusion, including cleanliness of components with tight clearance, such as control rod drive mechanism internals and major pump seals, and system or component closure following maintenance.

4) Characteristics of electrical components or circuits such as cable routing, splicing, lugging and potting, tightness of connections, and penetrations and fire stop installation which cannot be verified by post-maintenance and/or modification testing.

5) Characteristics of materials or components, such as surface finish, hardness, dimensions, leveling, alignment, torque, and clearance when such characteristics are critical to safety and when they will not be verified in subsequent tests or inspections.

c. Quality Instructions

Quality Instructions (QIs) are provided for those quality related activities of the Plant Quality organization outside of maintenance, modification and testing procedures/work packages that require quality inspection/review. Some of the key instructions are:

1) Quality Review of Procurement Documents - The Quality Reviewer (QR), as designated by the Plant Quality Manager, conducts a quality review of purchase and contract requisitions which include: Local Emergency Orders, Spare Parts Equivalency Reports, Major Changes, Major Exceptions and Transfer Requests. The QR verifies during his review that the procurement document:

a) Meets the guidelines of the Purchase Requisition Quality Review Guide,

b) Has a review by the Requirements Engineer to ensure the technical requirements are included and meet or exceed previously imposed specifications,

c) Contains applicable references,

d) Contains a statement concerning vendor requirements, 10CFR50 Appendix B requirements, QA Program requirements, 10CFR21 Reporting, Right of Access and Nonconformance Reporting, and

e) Confirms that the recommended vendor is on the Qualified Suppliers List.

Reviews which result in comments are documented on a Purchase Requisition Review Comments sheet and tracked on the Outstanding Plant Quality Review Comments Sheet until resolved.

2) Materials Receipt Inspection - Quality related materials received on site are controlled through the use of a Materials Receipt Inspection Report (MRIR) initiated by Plant Stores personnel. A plant Quality Inspector will verify on the MRIR that:

a) Identification and markings are in accordance with codes, specifications, purchase orders and drawings,

b) The manufacturer documented fabrication and testing requirements,

c) Protective covers and seals are in place,

d) Coatings and preservatives meet specifications,

e) Dessicants are in place and unsaturated,

f) No physical damage exists,

g) Cleanliness has been maintained, and

h) Other checks including weld preparations, workmanship, insulation resistance checks and dimensional checks have been conducted as appropriate.

Items passing review are affixed with a RELEASE tag. Discrepant items are identified with HOLD tags. Discrepancies are documented by Discrepancy Notices which are logged and tracked by the Plant Quality Group until resolved or dispositioned by the Material Review Board (MRB) as described in Section II.B.1.b.

3) Material Storage Inspection - This instruction provides Quality Inspectors with detailed procedures for verifying proper classification, packing, storage, cleanliness and segregation of materials received.

4) Cleanliness Inspections - This instruction provides for cleanliness verification of materials, equipment and components as required by work package instructions.

5) Housekeeping Inspections - This instruction provides for the use of Quality Inspection checklists to verify prescribed standards of cleanliness in various plant areas for the purposes of personnel safety, morale, contamination- ation control, fire prevention and degradation of plant operability. Discrepancies are noted on the Quality Inspection Checklists and tracked and resolved through the Inspection Comments/Resolution Sheet.

d. Plant Quality Surveillances

In addition to Quality Inspections, Quality Surveillances provide for observations of quality related activities. These surveys are documented on Quality Surveillance Report (QSR) forms. When deficiencies are noted during the Surveillance, a QN shall be written requiring corrective action. Plant Quality Surveillances provide sampling of a portion of station activities, whereas Quality Inspections provide for checks of specific quality affecting activities.

e. Stop Work

The Plant Manager or Plant Quality Manager may issue verbal stop work orders (SWOs) to halt unsatisfactory work and to control the processing, delivery, or installation of nonconforming material at Waterford 3. A verbal SWO is followed up with a written SWO which is documented on an SWO form, and logged for tracking. Notification of the SWO is made to the Senior Vice President Nuclear Operations, Corporate QA Manager, Safety Review Committee, Control Room Supervisor, individual company involved, Plant Manager, applicable department supervisor, and the Plant Operations Review Committee. When the deficiency is corrected, or sufficient steps have been taken to ensure that further noncompliance will not occur, a Stop Work Order Release (SWOR) form is issued by the Plant Quality Manager to allow work to resume. A SWOR form notes the corrective action taken and the reason for release.

G. Control of Contractor Quality Related Activities

1. Evaluation of Supplier's Quality Assurance Program

Suppliers providing safety related material or services must be on the LP&L Qualified Suppliers List (QSL). Before a vendor can be placed on the QSL, that vendor must be evaluated for acceptability by the LP&L Engineering/Systems Development QA Group.

An initial evaluation of a prospective contractor is performed by reviewing the contractor's:

a. Current quality assurance program manual, procedures and records;

b. Capability to conduct quality activities as revealed through examination of the facilities for performing such work and ability of the supplier's personnel;

c. Past performance based on experience that LP&L and other users have gained using identical or similar products and services.

Based on results of the above evaluation process, a supplier is classified:

a. Acceptable - no questions/concerns were raised during evaluation, or questions/concerns have either been resolved or have an insignificant impact on the item/service to be provided.

b. Unacceptable - the supplier's program doesn't meet procurement document requirements, or is not adequately implemented and review questions not satisfactorily addressed/resolved.

c. Conditionally Acceptable - only certain portions of a supplier's program are acceptable and purchase activities are limited to restrictions as imposed by the Engineering/System Development QA Group and noted on the QSL and are to be reflected in procurement documents. Full acceptability will be based on satisfactory supplier resolution of questions/concerns.

Once a contractor is on the QSL, a documented evaluation of the supplier will be performed annually and kept in that vendor's file.

While an audit is not necessary for a satisfactory annual evaluation, an audit must be performed every three years for a vendor to remain on the QSL.

2. Conduct of Contractor Quality Assurance Audits

a. Off-Site QA Audits

The Engineering/Systems Development group is responsible for ensuring all QSL listed contractors' offsite activities are audited to requirements of 10CFR50 Appendix B and LP&L's QA Program. Either they themselves will audit these contractors, or a vendor audit group will be contracted which has been qualified to LP&L's QA Program to conduct these audits. Audits will be conducted triennially per NRC Regulatory Guide 1.44.

b. On Site Auditing and Monitoring of Contractors

The Nuclear Operations Quality Assurance Manager directs audits of those organizations not within LP&L that are performing quality-related services at Waterford 3. These type of contractor audits are designated as "On-Site External Audits" and are conducted as previously described in Section II.F.1.a.

Periodic monitoring of on-site contractor activities is done through the use of Monitoring Reports as assigned by the QA Analysis Supervisor under the Operations QA program previously described in Section II.F.1.b.

3. Deficiency Reporting by Contractors

All vendor personnel performing on-site quality inspections of their company's work under LP&L's QA Program are required to report deficiencies identified for inclusion on a CIWA. This includes deficiencies discovered outside the scope of work being performed. A CIWA, which documents a deficiency and its corrective action/rework, is approved and tracked by LP&L management as described in Section II.B.1.a. Corrective action verification is provided by post closure review of the CIWA by the Plant Quality Group.

H. Station Modification Program

The purpose of the Station Modification program is to provide a mechanism through which design modifications to Waterford 3 are controlled and tracked. The Station Modification Package serves as a comprehensive, stand alone design change document which has undergone the appropriate interdisciplinary reviews. The process assures that no changes are made to the plant structures, systems and components which may introduce an unreviewed safety question per the criteria delineated in 10CFR50.59.

Any individual with the concurrence of the department head may request a design modification. Reasons for the change could include enhancement of the plant structures, systems, or components as a result of engineering preference, regulatory requirements, licensing commitments, ALARA, Human Engineering Design considerations, etc. Upon management approval of the request, a Station Modification Package (SMP) is assembled and receives appropriate interdisciplinary review. During the course of the design and review process checklists are used to ensure that, among other things, generic criteria such as separation, failure effects, fire protection, etc., are taken into account. The LP&L Quality Assurance Program requires that documentation appropriate to satisfy 10CFR50 Appendix B will be generated and retained.

Typical SMP Contents include:

1. Summary Functional Description

2. List of Attachments
   a) Purchase Orders/Requisitions
   b) Recommended Spare Parts
   c) New or Revised Drawings/Description Documents/Tech Manuals/Equipment Specification/System Description
   d) Vendor Information
   e) Design Calculations/Analyses
   f) Work Procedures

3. List of References

4. Bill of Material

5. Installation Instructions

6. Examinations (e.g. NDE requirements, PSI/ISI surveillance requirements)

7. Testing (including acceptance criteria)

8. Nuclear Safety Evaluation checklist (10CFR50.59 review)

Modification is performed via the Condition Identification and Work Authorization (CIWA) process described in Section II.B.1.a. Detailed Construction Packages (DCPs) are prepared for work activities. Pertinent design and reference information (e.g. isometric drawings, engineering instructions, code type testing requirements, installation procedures) is included in the DCP as well as instructions for implementation documentation. Acceptance criteria/tests/checks are developed and included as part of the DCP prior to implementation.

With the exception of minor changes, alterations (or field changes) to the DCP may not be made without approval of a revision to the SMP. For minor changes, the Action Engineer may authorize a Detailed Construction Package Change (DCPC) in which case a detailed description of the change is documented prior to implementation of the change. All DCPC documentation is retained as part of the work package and subject to post-implementation review.

Verification of implementation is first performed by the Station Coordinator and the Action Engineer who had the responsibility for developing the package. The Action Engineer assures that all work was accomplished according to the SMP and that acceptance criteria are met. Control Room controlled drawings are redlined to reflect the change. The Action Engineer then initiates a Modification Project Closeout Review form, and forwards it to the SM Coordinator

(SMC). The SMC forwards a Work Completion Notice to all affected disciplines so that appropriate documents are revised. Completed Document Update Forms are returned to the SMC to certify that all affected drawings, procedures, programs, and/or training plans have been revised and approved. At this time the CIWA is closed and the SM Closeout Review form initiated and sent to the Systems Engineering Department Head for review and approval of the Modification Project Closure Review form. See Section II.I.3 for quality review and storage of SMPs.

I. Records

1. Project Files

Project Files is the focal point for storage and maintenance of uncontrolled records and documents. The filing system used is a computerized document retrieval system. Completed records forwarded to Project Files are indexed on the computer, then microfilmed and stored by Film Access Number. This number indicates the roll and frame number of a particular document or its hard copy location. Records are thus effectively filed under document number, record type, date, title, vendor, subject, equipment number, etc., allowing a user to retrieve documents in a timely manner.

Records processed by Project Files are received under a standard transmittal form which lists the contents forwarded. The records transmitted are inspected to ensure that all of the records on the transmittal form are present, complete, and validated. If the records are complete and agree with the transmittal form, then the form is signed by the package reviewer, filed, and a copy sent to the originator.

Unlimited access to Project Files is granted only to personnel assigned to the Project Files Group. This minimizes the possibility of lost/misplaced records by personnel who have not been indoctrinated in the proper procedures for control of documents. The Project Files Supervisor may authorize temporary access when individual requirements cannot be handled by the Project Files personnel. QA records may be accessed by request for work/review, but may only be reviewed in designated controlled areas.

2. Document Control

All controlled documents such as approved drawings, specifications, procedures, technical manuals, safeguards information, FSARs and SMPs are processed by the Document Control Group. This includes receiving, recording, distribution, updating and retrieval of those documents affecting quality to ensure only the latest applicable revision is used for operation and maintenance at Waterford 3. Controlled issue is maintained by the use of standard transmittal forms which must be signed and returned by assigned copy holders on established distribution lists. Direct access to files maintained by the Document Control Group is limited to group personnel and their supervisors.

3. Records Quality Review

Quality-related Station Modification Packages (SMPs) are reviewed by the Operations QA group before final closure and transmittal to Project Files. A Quality Reviewer (QR) completes a QA Review Checklist on the SMP to ensure that records establishing proper review and other necessary records are retained. The QR review scope ensures that documents required by the SMP index and controlling procedures are included, proper review and approval is indicated on the records, applicable codes and quality standards are identified, test and inspection requirements are documented, and safety evaluation and design verification is performed.

Comments from this review are tracked and closed out on a standard Procedure Review Comments sheet, ensuring completeness of the SMP. The Checklist, comments sheet and any additional records generated by the QR's review are filed for storage.

Similarly, quality related documents generated by the Plant Quality and Quality Assurance groups in the performance of their duties are reviewed and retained in Project Files. These records include audit reports, nonconformance reports, receipt inspection reports, CIWAs, QNs, DNs, Stop Work Orders, QC surveillances, QC Inspector certification, hold tags, conditional release tags, various NDE documents, calibration records, and NDE personnel qualification and training records.

4. Status

During the construction phase, records management was primarily handled by the architect/engineer. As a result, although current records are handled and processed as described above, there remains a backlog of construction phase records to process through the LP&L Records System. Additionally, to assure continued high quality in records storage and retrieval, LP&L management is evaluating the current records management process for Waterford 3 to identify any areas needing improvement. It is expected that appropriate recommendations of this evaluation will be initiated by November 30, 1984.