

APPENDIX B

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

NRC Inspection Report: 50-382/86-32

License: NPF-38

Docket: 50-382

Licensee: Louisiana Power & Light Company (LP&L)
N-80
317 Baronne Street
New Orleans, Louisiana 70160

Facility Name: Waterford Steam Electric Station, Unit 3

Inspection At: Killona, Louisiana

Inspection Conducted: December 8-12, 1986 (onsite)
to March 13, 1987 (NRC Region IV office)

Inspectors:

for *R. E. Norman*
D. E. Norman, Reactor Inspector, Team Leader
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4/13/87
Date

for *R. E. Bess*
E. Bess, Reactor Inspector, Engineering
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4/13/87
Date

A. R. Johnson
A. R. Johnson, Reactor Inspector (Nuclear
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4/13/87
Date

Also participating in the inspection and contributing to the report were:

- R. Heishman, Chief, Vendor Program Branch, DQAVT, IE
- R. Moist, Equipment Qualification & Test Engineer, VPB, DQAVT, IE
- J. Grossman, Member of Technical Staff, Sandia Normal Laboratories (SNL)
- J. Fehringer, Consultant Engineer, Idaho National Laboratory (INEL)
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Approved:

R. E. Ireland
R. E. Ireland, Chief, Engineering Section
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4/13/87
Date

Inspection Summary

Inspection Conducted December 8-12, 1986 (onsite) to March 13, 1987 (NRC Region IV office), Report 50-382/86-32

Areas Inspected: Special, announced inspection to review the licensee's implementation of a program for establishing and maintaining the qualification of electric equipment within the scope of 10 CFR 50.49. In preparation for this inspection, the NRC team included a review of LP&L's implementation of equipment qualification (EQ) corrective action commitments, identified in Safety Evaluation Report NUREG 0787, (SER) Supplements 5, 8, and 10 (June 1983, December 1984, and March 1985), which were satisfactorily accepted by the NRC staff at that time with regards to equipment for which justification for interim operation (JIOs) were provided prior to the November 30, 1985, deadline.

Results: The inspection determined that the licensee has implemented a program to meet the requirements of 10 CFR 50.49 except for certain deficiencies listed below in Tables I and II.

The licensee's letter of February 2, 1987, (L. L. Bass of LP&L to A. R. Johnson of NRC, Region IV), provided additional information subsequent to the onsite inspection and addressed the inspection findings presented in the exit interview by the NRC on December 12, 1986. The licensee's information and proposed methods of resolution to the inspection findings have been reviewed and were considered in preparation and issuance of this report.

Table I
Potential Enforcement/Unresolved Items:

<u>Name</u>	<u>Report Paragraph</u>	<u>Item Number</u>
1. Borg-Warner Motor Operators, Model 39400; station modification upgrade requirements	4. f(1)	50-382/8632-01
2. ITT Barton Pressure Transmitters, Model 763 and 764; submergence requirements	4. f(3)	50-382/8632-02
3. General Electric CVC Charging Pump Motors, Okonite Bolted Type Taped Heater Splices; lacking qualification documentation	4. h(2)(c)	50-382/8632-03
4. Limitorque SMB-00 Motor Operators, Thomas and Betts Blind Barrel Crimp Cable Splices; lacking qualification documentation	4. f(4)	50-382/8632-04
5. Limitorque Motor Operators; internal wiring qualification	4. f(6)	50-382/8632-05
6. BIW Cable Assembly (includes CIR series Connectors and Flex Conduit); DBA temperature qualification requirement	4. f(7)(a)	50-382/8632-06
7. BIW Cable Assembly (includes CIR series Connectors and Flex Conduit); replacement schedule due to process temperature aging effects requirement	4. f(7)(b)	50-382/8632-07

Table II
Open Items:

<u>Name</u>	<u>Report Paragraph</u>	<u>Item Number</u>
1. Conax Electrical Penetration, Model 7320-10,000 Series; a. documentation deficiency, MSLB temperature excursion b. documentation deficiency, functional performance calculations c. documentation deficiency, analysis of Kulka terminal blocks (IN 84-47)	4. f(8)(a) 4. f(8)(b) 4. f(8)(c)	50-382/8632-08
2. Conax Electrical Penetration, Model 7320-10,000 Series; engineering study of polysulfone seals on damaged modules	4. h(4)(b)	50-382/8632-09
3. Okonite 5 KV Cable and Splices; thermal lag analysis and documentation deficiency	4. f(9)(a) 4. f(9)(b)	50-382/8632-10
4. Rosemount RTDs, Model 104-1619-6; submergence qualification requirement	4. f(10)	50-382/8632-11
5. BIW Coaxial Cable; functional performance calculation for operating voltage and current levels	4. f(11)	50-382/8632-12
6. Okonite 600 VAC Cable; qualification of cable jacket and documentation deficiencies	4. f(12)(a) 4. f(12)(b) 4. f(12)(c)	50-382/8632-13
7. Rosemount Pressure Transmitters, Model 1153 Series A; RTV plug seal replacements	4. h(5)	50-382/8632-14
8. ITT Barton, Model 763/764 Pressure Transmitter; conduit seal requirements	4. h(6)	50-382/8632-15
9. Seimens-Allis HPSI Motors, Model 113; a. oil reservoir fill holes and ventilation covers b. rear ventilation screens	4. h(7)(a) 4. h(7)(b)	50-382/8632-16
10. Allis Chalmers Motors, Model 500P56; a. motor bearing oil leakage b. air intake filter	4. h(8)(a) 4. h(8)(b)	50-382/8632-17

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| 11. General Atomic Radiation Detector, Model RD-23; Rockbestos test report and performance data for BIW coaxial cable | 4. f(14) | 50-382/8632-18 |
| 12. Okonite V-Type Taped Cable Splices used in:
a. Limitorque motor operators
b. General Electric motors | 4. h(1)
4. h(2)(b) | 50-382/8632-19 |
| 13. Limitorque SMB-2 Motor Operator; improper installation/inadequate maintenance of Okonite V-type taped cable splices | 4. h(3) | 50-382/8632-20 |
| 14. Limitorque SMB Motor Operators;
a. switch compartment component aging requirements
b. separate temperature qualification on degradable items | 4. f(5) | 50-382/8632-21 |
| 15. Seimens-Allis HPSI Pump Motor; qualification analyses and test reports | 4. f(2) | 50-382/8632-22 |
| 16. Conax Electrical Penetrations Model 7320-10,000 Series; terminal block qualification | 4. h(4)(a) | 50-382/8632-23 |

DETAILS1. Persons ContactedLP&L

R. Barkhurst, Vice President - Nuclear
T. F. Gerrets, Quality Assurance Manager
J. G. Carns, Plant Manager - Nuclear
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K. W. Cook, Nuclear Support and Licensing
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L. L. Bass, Technical Support Engineering
W. J. Hayes, Technical Support Engineering
R. F. Burski, Nuclear Operations Engineering Manager
J. R. McGaha, APM - Operations and Maintenance
R. J. Murillo, Nuclear Licensing Manager
R. P. Thibodeaux, Technical Support Engineering
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T. H. Smith, Maintenance Superintendent
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M. V. Hamilton, Technical Support Engineering
B. R. Messitt, Engineering
R. V. Seidl, I&C Engineering Supervisor

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J. N. VanName, Consulting Engineer
I. V. Sydoriak, Mechanical Engineer

NRC

J. G. Luehman, Senior Resident Inspector

2. Purpose

The purpose of this inspection was to review the licensee's implementation of the requirements of 10 CFR 50.49.

3. Background

NUREG-0588 was issued in December 1979 to promote an orderly and systematic implementation of equipment qualification programs by industry and to provide guidance to the NRC staff for its use in ongoing licensing reviews. The positions contained in NUREG-0588 provided guidance on (1) how to establish environmental service conditions, (2) how to select methods that are considered appropriate for qualifying equipment in areas

of nuclear plants, and (3) other areas such as margin, aging, and documentation.

A final rule on environmental qualification of electric equipment important to safety for nuclear power plants became effective on February 22, 1983. The rule 10 CFR 50.49, specifies the requirements to be met for demonstrating the environmental qualification of electrical equipment located in a harsh environment. In accordance with 10 CFR 50.49, paragraph (k), the same electrical equipment at Waterford 3 may be qualified in accordance with the acceptance criteria specified in Category II of NUREG-0588.

To document the degree to which the LP&L environmental qualification program complies with the NRC environmental qualification requirements and criteria, LP&L provided equipment qualification information by letters dated November 15, 1982; November 30, 1982; January 27, 1983; February 2, 1983; February 11, 1983; February 24, 1983; and March 2, 1983, to supplement the information in Section 3.11 of the FSAR.

Supplement 5 to the SER NUREG-0787, (SSER-5) dated June 1983, documented what the NRC staff had reviewed and evaluated regarding the Waterford 3 program for the environmental qualification of electrical equipment important to safety. This review included (1) the systems selected for qualification, (2) the environmental conditions resulting from design basis accidents, and (3) the methods used for qualification. In addition, LP&L added to their EQ program information demonstrating qualification of all electrical equipment located in a harsh environment, including (1) nonsafety-related equipment whose failure under postulated accident conditions could effect safety-related equipment; and (2) equipment required by the TMI action plan for post accident monitoring purposes, in accordance with RG 1.97. Justifications for interim operation in accordance with 10 CFR 50.49 would be provided if this equipment did not adequately demonstrate qualification. This qualification information and justifications were submitted to the NRC staff for review and approval before the granting of an operating license at Waterford 3.

In addition, a license condition was required to be met by LP&L, where all installed electrical equipment important to safety, located in a harsh environment, was required to be qualified before startup from the first refueling outage. This date was later modified to the November 30, 1985, deadline. Once qualification was completed, documentation was required to be incorporated into an auditable file. On the basis of these considerations, the NRC staff concluded that satisfactory completion of the corrective actions, identified in the Appendices of SSER-5 would ensure conformance with the requirements of 10 CFR 50.49.

By letter dated August 3, 1983, and March 13, 1984, LP&L had submitted the complete list of TMI action plan equipment that required qualification and the qualification status of the equipment. All the equipment located in a harsh environment was included in the qualification program. For any equipment that was not qualified, a JIO was provided. The NRC staff

evaluation of these JIOs was discussed and the NRC staff found LP&L's responses acceptable.

By letter dated November 7, 1983, LP&L responded with the statement that no nonsafety-related electrical equipment located in a harsh environment whose failure under postulated accident conditions could prevent satisfactory accomplishment of a safety function by safety-related equipment. The NRC staff concluded that the applicant's response to this requirement was acceptable.

LP&L was required to evaluate all NRC I&E information notices (IENs) applicable to equipment environmental qualification and either determined that the IENs do not apply to equipment at Waterford 3 or take corrective action to ensure the equipment is qualified.

SSER-8, December 1984, described the NRC staff evaluation of LP&L's responses to outstanding EQ items and described the NRC staff position at that time for concluding that conformance with 10 CFR 50.49 had been demonstrated.

LP&L, in response to NRC Generic Letter 84-24, submitted their certification (W3P85-0193) of the LP&L environmental qualification program to the NRC staff on January 28, 1985, as follows:

- a. LP&L had in place and was implementing at that time an environmental qualification program that satisfied the requirements of 10 CFR Section 50.49 as documented in the Operating License, NUREG 0787, and SSER-8.
- b. The Waterford Unit 3 Station had at least one path to safe shutdown using fully qualified equipment or equipment for which there was a JIO accepted by the NRC staff pending full qualification of any equipment not fully qualified.
- c. All other Waterford Unit 3 Station equipment within the scope of 10 CFR Section 50.49 was either fully qualified or a JIO had been accepted by the NRC pending full qualification.

In addition, SSER-8 to the Waterford SER required that an aging analyses for all nonmetallic components in safety-related mechanical equipment located in a harsh environment should be completed before exceeding 5 percent power. The Waterford 3 low-power operating license contained a license condition to ensure that this requirement be fulfilled. By letter from LP&L to the NRC staff dated February 15, 1985, LP&L informed the staff that the required analyses have been performed, and that on the basis of these analyses, all safety-related mechanical equipment is qualified for its intended service life and environmental conditions. The results of the analyses are contained in the equipment qualification files. These analyses were performed in accordance with the methodology previously accepted by the NRC staff (SER Supplements 5 and 8). On the

basis of information provided in LP&L letter, February 15, 1985, the NRC staff found that LP&L had met the requirements of this license condition.

SSER-10, dated March 1985, described the NRC staff position in that before November 30, 1985, LP&L would have environmentally qualified all electrical equipment according to the provisions of 10 CFR 50.49.

The above identified documents were reviewed by the inspection team members and used in preparation for this inspection. The inspection involved an onsite and subsequent NRC Region IV in-office inspection of records subsequently furnished by the licensee.

4. Findings:

a. EQ Program Compliance With 10 CFR 50.49

The NRC inspectors examined the licensee's program for establishing the qualification of electric equipment within the scope of 10 CFR 50.49. The program was evaluated by examination of the licensee's qualification documentation files, review of procedures for controlling the licensee's EQ efforts, and verification of adequacy and accuracy of the licensee's program for maintaining the qualified status of electrical equipment. Based on the inspection findings, which are discussed in more detail below, the inspection team determined that the licensee has implemented a program to meet the requirements of 10 CFR 50.49 for the Waterford Steam Electric Station, Unit 3 although some deficiencies were identified (refer to Sections 4.f and 4.h).

b. EQ Program Procedures

The inspection team examined the implementation and adequacy of site policies and procedures for establishing and maintaining the environmental qualification of electrical equipment in compliance with the requirements of 10 CFR 50.49. The licensee's methods for establishing and maintaining the environmental qualification of electric equipment were reviewed in the following documents:

Nuclear Operations Procedures

<u>Proc. No./Revision</u>	<u>Title</u>	<u>Date</u>
NOP-009/Rev. 0.1	Equipment Qualification	10/20/86

Project Management Procedures

<u>Proc. No./Revision</u>	<u>Title</u>	<u>Date</u>
PMP 101/Rev. 2	The Project Management Procurement Process	04/04/86

PMP 103/Rev. 2	Preparation and Processing of Purchase Documents	05/02/86
PMP 302/Rev. 1	Procedure Change Notice (PCN)	08/07/85
PMP 304/Rev. 4	Modification Project Closeout	08/28/86
PMP 322/Rev. 1	Engineering Purchase Requisition Preparation	01/27/86
PMP 325/Rev. 1	Equipment Qualification	11/17/86

Project Management Instructions

<u>Instruct No./Revision</u>	<u>Title</u>	<u>Date</u>
PMI-309/Rev. 0	Preparation of Equipment Qualification Assessment Reports	11/22/85
PMI-310/Rev. *	Development, Control, Update, and Issue of the EQML	*
PMI-311/Rev. 1	Development, Control and Update of EQ Data Base	11/19/86
PMI-312/Rev. 0	Use of the Materials Aging Data Base (System 1000)	11/22/85
PMI-313/Rev. 0	Instruction Change Notice (ICN)	04/18/86

Engineering Procedures

<u>Proc. No. /Revision</u>	<u>Title</u>	<u>Date</u>
PE-2-006/Rev. 8	Plant Engineering Station Modification	07/16/86
PE-2-014/Rev. 3	Equipment Qualification	12/17/85

Administrative Procedures

<u>Proc. No./Revision</u>	<u>Title</u>	<u>Date</u>
UNT-1-015/Rev. 0	Equipment Qualification Program	11/26/85

*revision and date not documented by the NRC inspector during the inspection

conditions and malfunctions that indicate equipment degradation or failure. The NRC inspection team also reviewed the following specific documents pertaining to the licensee's implementation of his EQ maintenance program:

- EEQD file 3.2 - Asco Solenoid Valve
- Installation and maintenance instructions - Bulletin 83-16
- EEQD file 35.1 - Valcor solenoid operated valves.
- EQ maintenance input summary - LPL-EQMI, 35.1
- Environmental Qualifications Assessment on Target Rock solenoid valves - Report No. LPL-EQA, 35.6
- EQ maintenance input file 35.6

In addition to procedural reviews and personnel interviews, the NRC inspection team, on a sampling basis, reviewed maintenance procedures and records for selected components covered in the EQ file reviews and plant walkdown inspection. Based on these inspections, the NRC inspection team concluded that the LP&L maintenance program appears well planned and implemented.

(2) EQ Replacement/Procurement Program

The LP&L EQ replacement/procurement program is an integral part of the licensee's overall EQ program, and is addressed in procedures PMP-101, UNT-8-003 and UNT-8-001. The referenced procedures describe the licensee's overall program for meeting 10 CFR 50.49. The procedures describe the method for plant staff personnel to initiate and obtain items identified as EQ for plant station modification, spare and replacement components, subcomponents, parts, material, tools, and services.

The NRC inspection team concluded that these procedures will cover the LP&L EQ activities and requirements. The EQ replacement/procurement program appears well planned, documented, and implemented as required by 10 CFR 50.49.

(3) Control of Plant EQ Modification

The NRC inspection team examined the implementation and adequacy of the licensee's control of plant EQ modifications. The modification program is addressed in procedures PE-2-006 and PMP-304. The licensee's program was reviewed to verify that adequate procedures and controls had been established to meet the requirements of 10 CFR 50.49. Areas of the program reviewed included methods and their effectiveness for:

- Describing the method for processing modifications to plant systems from the time of request through implementation to final closeout.
- Controlling plant modifications including installation of new and replacement equipment, and providing for updating replacement equipment to 10 CFR 50.49 criteria.

The NRC inspection team concluded that these procedures will cover the LP&L EQ activities and requirements. The EQ program for control of plant modifications appears well planned, documented, and implemented as required by 10 CFR 50.49.

No Potential Enforcement/Unresolved Items or Open Items were identified during this inspection for these EQ programs in paragraphs (1) through (3) above.

d. EQ Surveillance/Training/and Audit Programs

The NRC inspection team did not review the procedures and controls for the Waterford 3 EQ surveillance (preventative maintenance) program, EQ training program, and EQ audit program. Verification of these program implementations will be accomplished during a subsequent NRC inspection.

e. Equipment Qualification Master List - Electrical (EQML-E)

Development, control, update, and issuance of the EQML-E is prescribed in project management instruction PMI-310.

Considered in the preparation of the EQML-E by the licensee was review of Technical Specification, emergency operating procedures (EOPs), FSAR, architect engineers master equipment list/Q-list, vendor information, purchase orders, P&IDs, and control wiring diagrams (CWDs) for the equipment located in a harsh environment which requires qualification.

In order to test the completeness of the EQML-E, specific components were selected from the Waterford 3 CWDs relating to the safety injection (SI) system. The following CWD's and P&ID's were selected:

- CWD-LOU-1564-B-424, sheet 500S - High pressure safety injection pump A.
- CWD-LOU-1564-B-424, sheet 507S - High pressure safety injection pump AB.
- CWD-LOU-1654-B-424, sheet 512S - Reactor coolant loop #2 hot leg flow control.

- CWD-LOU-1564-B-424, sheet 527 - High pressure safety injection flow control valve.
- CWD-LOU-1564-B-424, sheet 430S - Low pressure safety injection pump.
- CWD-LOU-1564-B-424, sheet 552S - Safety injection tank A.
- P&ID-LOU-1564-G-167-SI - flow diagram.

Also the Waterford 3 EOP No. 902-002 entitled "LOCA Recovery Procedure," dated February 8, 1985, and operating procedure No. OP-9-008," Revision 6, dated September 16, 1986, entitled "Safety Injection System," were reviewed, by the NRC inspection team.

All of the components and equipment selected for review were found on the EQML-E. Components were also selected from an earlier Waterford 3 EQML-E submittal dated October 25, 1985. These components were also found on the current EQML-E dated November 12, 1986, Revision 4.

Based on the NRC inspection team's review, the 10 CFR 50.49 EQML-E is considered satisfactory.

f. Environmental Qualification Documentation Files

The licensee's Equipment Qualification File (EQF) has been established and is being maintained to meet the requirements of 10 CFR 50.49 at the Waterford Unit 3 Steam Electric Station. The requirements for establishing, controlling, maintaining, routing, filing, and updating the EQF, are contained in LP&L procedures (1) PMP-325, Revision 1, "Project Management Procedure - Equipment Qualification"; (2) UNT-1-015, Revision 0, "Administrative Procedure - Equipment Qualification Program"; and (3) NOP-009, Revision 0.1, "Nuclear Operations Procedures - Equipment Qualification". Other LP&L procedures which govern EQF activities are listed in paragraph 4.b of this report. The responsibilities for an auditable and complete EQF is assigned to LP&L ENS personnel.

The NRC inspection team examined the licensee's EQF for 37 selected electrical equipment qualification documentation (EEQDs) packages to verify the qualified status of equipment within the scope of 10 CFR 50.49.

In addition to comparing plant accident conditions with qualification test conditions and verifying the bases for these conditions, the NRC inspection team selectively reviewed areas such as (1) required post accident operating times compared to the duration of time the equipment has been demonstrated to be qualified; (2) similarity of type tested equipment to that installed in the plant; (3) evaluation

of adequacy of test conditions to environmental profiles of the plant; (4) aging calculations for qualified service life; (5) maintenance, and replacement part schedules; (6) the effects of insulation resistance (IR) decreases on component performance; (7) adequacy of demonstrated accuracy of equipment under plant environmental conditions; (8) evaluation of test anomalies relating to installed equipment configurations; and (9) applicability of EQ problems as reported in NRC IENs and Bulletins (IEBs) and their resolution.

During this review of the EQF the inspection team identified the following Potential Enforcement/Unresolved Items and Open Items, described below.

- (1) EEQD 42.3, Borg Warner Operators, Model 39400, UNID No.'s SI-MVAAA-405A, and SI-MVAAA-405B

The above operators are located inside containment and are used for the shutdown cooling isolation valves. The licensee considers these operators qualified to the requirements of NUREG 0588, Category I. A station modification No. SM-1398, Revision 1, was in place during this NRC inspection to upgrade these operators in establishing similarity between the plant installed models (39400) and the tested model (86090). The NRC inspection team reviewed the station modification which showed that similarity would be established once the upgrade work was completed. Completion of SM-1398, Revision 1, considers these operators qualified to the requirements of 10 CFR 50.49 NUREG 0588, Category I. The upgrade was scheduled for completion during the Waterford 3 first refueling outage during which this NRC inspection occurred.

The EEQD 42.3 file is required to document and reflect the as-built installed upgrades of SM-1398. A JIO for Borg-Warner operators, dated May 16, 1985, addressed the test anomalies, resolutions, and required modifications (reference: Waterford 3 letters, W3P85-1188 of May 16, 1985, and W3P85-3130 of November 1, 1985). The licensee's letter to NRC Region IV, dated February 2, 1987, provides further information on the licensee's basis for interim operation and further discusses the scheduled completion of the qualification for these actuators.

LP&L submitted a JIO to the NRC on May 16, 1985, targeting qualification of these actuators by the November 30, 1985, deadline date of 10 CFR 50.49. During the testing program, several equipment anomalies occurred in which design changes to the type test actuator, were either implemented on the actuator type test specimens and/or required changes to the installed equipment, as follows:

- (a) The motor/pump mechanical coupling separated during seismic testing. The pump and motor shafts are connected by a rotating mechanical coupling. The coupling is keyed to the motor shaft and laterally by a set screw. During the test, the set screw was found to have backed off the motor shaft. The motor/pump coupling was secured by indenting the motor shaft and adding one additional set screw.
- (b) An anomaly occurred during testing in which an improper electrical wiring connection to a single phase caused an operator failure. All terminal blocks were removed and replaced with qualified splice materials.
- (c) A solenoid valve failed due to chemical spray intruding through a faulty conduit to the solenoid coil connections. This anomaly occurred during simulated accident testing as a result of item (b) above in which the conduit was not adequately replaced to the operator wiring connection. The solenoid valve and other electrical conduit pathways were sealed. O-rings were added to the solenoid valve assembly as a secondary seal.
- (d) As a result of the multiple test runs, excessive contamination of the hydraulic fluid occurred. The hydraulic fluid contamination clogged the small filter in the solenoid actuated pilot valve causing excessive pressure resulting in the seizure of the pump and the decoupling of the motor shaft. The hydraulic filter size was increased to reduce the potential for clogging. A check valve was required to be added to the hydraulic reservoir to limit ingress of chemical spray and other contaminants into the hydraulic fluids (however, this check valve was an integral part of the installed equipment at Waterford 3).
- (e) During manufacture, the wrong size shim was used on the type test pilot piston/cylinder configuration. As a consequence of improper tolerance, the actuator failed immediately when operated at the peak test temperature during accident testing. The installed equipment at Waterford 3 is similar but does not have the same pilot piston configuration and the licensee claims the anomaly is not applicable. No design changes were required.

With the exception of item (b) above, and item (e) which the licensee claims not applicable, the design changes required were not incorporated on the Waterford 3 installed equipment configuration as follows:

The pump/motor coupling set screw modification was not implemented on the installed actuators because the licensee

maintains that during the fabrication of the type test actuator, the sealing surface on the test actuator was identified as being abnormal. The specification allowed ± 0.005 inch. The sealing surface was just within the maximum allowable tolerance. The licensee judged this condition as the contributor in providing the inclined forces necessary to decouple the coupling. The pump/motor coupling for the installed operators, however, were verified by the licensee to be well within the allowable tolerance and judged acceptable.

The O-rings, used for secondary sealing, were not available for use during the design change period of the installed actuators due to the extensive machining required. The licensee elected to seal the electrical conduit with RTV 106 potting compound.

A change to a larger filter was not implemented on the installed actuators due to unavailability of the component and the extensive machining required to implement this design change.

All modifications required to establish qualification by similarity were not completed by the November 30, 1985, deadline, but rather completed during the first refueling outage during which this NRC inspection occurred. Potentially, this equipment was in an unqualified status from November 30, 1985, to this outage.

This item is considered a Potential Enforcement/Unresolved Item (50-382/8632-01).

- (2) EEQD 4.12 and 4.13, Seimens/Allis Motors, Model 113
UNID No.'s SI-EMTR-3AB-3A and SI-EMTR-3B-3A

The above Seimens-Allis motors are located outside containment in the reactor auxiliary building and are used as drivers for the high pressure safety injection (HPSI) pumps AB and B. The Waterford 3 plant considers these motors qualified to the requirements of 10 CFR 50.49/NUEG 0588, Category II. Specific test reports were not referenced in, or contained in EQF, EEQD 4.12 and 4.13, at the time of this inspection. LP&L's letter to NRC Region IV, dated February 2, 1987, provided test report No. NQ 890339-1, Revision 0, dated June 26, 1981, "Equipment Qualification for Class 1E Safety-Related Service in Power Generation Stations Outside Containment." This document now forms an attached EQ assessment incorporated as part of the EQF, EEQD 4.12 and 4.13 for Waterford 3 HPSI and LPSI motors. The NQ 890339-1 document is currently undergoing NRC review and may be closed out during a subsequent NRC inspection.

The EQF, EEQD 4.12 and 4.13 for Siemens-Allis HPSI pump motors did not establish qualification during the time of the NRC inspection because the qualification documentation was incomplete and not available in the EQF to support qualification. This item is considered an Open Item (50-382/8632-22).

(3) EEQD 8.2A, ITT Barton Pressure Transmitters, Models 763 and 764

Examination of an equipment qualification assessment (EQA) contained in EEQD 8.2A, identified a deficiency concerning submergence of ITT Barton model 763/764 pressure transmitters. The basis of qualification for this equipment is NUREG 0588, Category I. The EQA did not contain documentation to show that a type test was conducted for the equipment in a submerged environment. LP&L's position was that the equipment was qualified for submergence based on a letter from ITT Barton who had performed a steam test at a prescribed pressure. The ITT Barton letter claimed that this test equated to the equipment being submerged under 30 feet of water under type test pressure conditions. The NRC inspection team during the inspection concluded that the EQF, EEQD 8.2A for ITT Barton Model 763/764 pressure transmitters, did not adequately establish qualification because of failure to demonstrate qualification based on DBA conditions, in that no type test to demonstrate qualification for submergence were contained in the EQF.

LP&L's letter to NRC Region IV dated February 2, 1987, provided engineering evaluation letter No. W3B87-0218, dated January 29, 1987, "Analysis of Reactor Containment Building Sump Level Indication for Submergence." This document now forms an integral part of EEQD 8.2A for the Waterford 3 ITT Barton pressure transmitter, models 764 and 764, used for post accident monitoring purposes. Analysis W3B87-0218 now indicates that containment sump level transmitters SP-ILT-6705A and B, located approximately 5 feet below the accident flood level, will not be used for DBA/post DBA conditions. Analysis W3B87-0218 also indicates that SIS sump level transmitters SI-ILT-7145A and SI-ILT-7145B, located above the postulated accident flood level will be used in lieu of SP-ILT-6705A and B, during the post accident period. SI-ILT-7145A and B will therefore not be required to be submergence qualified.

LP&L indicates that the EQF, EEQD 8.2A will require modification to incorporate the above changes. Also, the emergency operating procedures will be reviewed to clarify use of the changed post accident indicating instruments. EQF, EEQD 8.2A will be required to reflect the correct accident operating times for the appropriate transmitters.

Because the EQF, EEQD 8.2A, during the time of the NRC inspection, did not adequately establish qualification for submergence of the ITT Barton models 763 and 764 for post accident conditions, and because its safety-related function during DBA/post DBA is now rescinded by substitute transmitters above flood level, this item is considered a Potential Enforcement/Unresolved Item (50-382/8632-02).

(4) EEQD 3.1.A, Limitorque Motor Operators, Model SMB-00, Thomas & Betts Blind Barrel Crimp Cable Splices

The basis of qualification for these operators are NUREG 0588, Category II. During the walkdown of limitorque valve operators, it was observed that motor lead connections in operator EWF-MVAAA-220-A had been spliced with blind barrel (pigtail) crimp splices. Qualification test reports provided for the operators contained in the EQF, EEQD 3.1A did not include qualification of the splices; there was no documentation at the time of the inspection to show that the splices had ever been separately qualified.

The licensee's letter to NRC Region IV, dated February 2, 1987, provided: (1) a memorandum to the EQF, EEQD 3.1A, dated January 16, 1987; and (2) a W3B87-0300 response letter to LP&L from Limitorque Corporation, dated January 6, 1987. The above memorandum presents LP&L's position with respect to 38 Limitorque actuators which have dual voltage motors incorporating extra motor leads interconnected to field cable, utilizing Thomas and Betts, type RB-4 or RC-6, blind barrel (pigtail), crimp type, cable splices. The LP&L position references the W3B87-0300 letter which indicates a dual voltage motor type test, utilizing Thomas & Betts RB-4 and RC-6 crimp type splices, was performed. However, the crimp type cable splice information was not fully documented in Limitorque test report numbers 600198 and 600376A.

NUREG 0588, Revision 1, Category II, paragraph 5, requires that qualification documentation shall verify that each type of electrical equipment is qualified for its application and meets its specified performance requirements. The basis of qualification shall be explained to show the relationship of all facets of proof needed to support adequacy of the complete equipment. Data used to demonstrate the qualification of the equipment shall be pertinent to the application and organized in an auditable form. The documentation should include sufficient information to address those items identified in NUREG 0588, Appendix E, which includes splices.

The qualification documentation referred to in Limitorque test report 600198 and 600376A should be placed in EEQD3.1A and evaluated by the NRC for its applicability to demonstrate

qualification of the splices for the EFW valve operators. The qualification test reports provided in EQF, EEQD 3.1A, together with any new qualification data should be documented in EQF, EEQD 3.1A, to demonstrate full qualification requirements.

This item is considered a Potential Enforcement/Unresolved Item (50-382/8632-04).

- (5) EEQD 3.1, Limitorque Motor Operations, SMB Series Switch Compartment Component Aging Requirements; Qualification of Temperature Degradable Items

The basis of qualification for these operators are NUREG-0588, Category II. It has been the practice of LP&L to energize space heaters in Limitorque valve operator limit switch compartments during plant operation. Since the heaters were not considered in the operator qualification documentation of the EQF, EEQD 3.1, precautions should be taken to ensure that the energized heaters will not affect operator qualification. One concern of the NRC inspection team was resolved during the inspection where it was found that the heaters were supplied from a Class 1E source, but double fused for purposes to protect the power supply in the event of a heater failure. Another area of concern of the NRC inspection team which had not been adequately addressed, was that no documentation was available in EQF, EEQD 3.1, to show the effects of accelerated aging of temperature degradable items within the limit switch compartment due to temperature rise and radiant heat transfer produced by the heaters. It was also observed by the NRC inspection team that the EQF, EEQD 3.1 did not contain documentation to qualify components within the limit switch compartment separately.

The licensee's letter to NRC Region IV, dated February 2, 1987, indicated a station modification program in effect which has deenergized those heaters which were energized. The qualified life of the deenergized heaters has also been reevaluated considering the time that the heaters were energized. The results of this station modification program should be fully documented and placed in the EQF, EEQD 3.1. This item will be evaluated during a subsequent NRC inspection.

This item is considered an Open Item (50-382/8632-21).

- (6) EEQD 3.1, Limitorque Motor Operators, SMB Series, Internal Wiring Qualification

Generic letter 85-15 sets a deadline of November 30, 1985, for all equipment qualification, except where the Commission has granted an extension. Additionally, IENs 83-72 and 86-03 identified several internal parts or design features of Limitorque operators as possible sources of qualification

deficiencies. The NRC inspection team found that the concern of unidentified wiring addressed by IEN 86-03 existed at Waterford 3 until September 1986 at which time replacement of potentially unqualified wiring was reportedly completed. A review of information provided during the NRC inspection suggested that continued operation during the November 30, 1985, through September 1986 time interval could be in noncompliance with 10 CFR 50.49, NUREG 0588, Category II, paragraph 5, and Generic Letter 85-15 because the EQF, EEQD 3.1 lacked supporting documentation to demonstrate qualification for the unidentified wiring removed.

The licensee's letter to NRC Region IV, dated February 2, 1987, provided a time history account in LP&L's response to IEN 86-03. LP&L implemented scheduled inspections and work on all 64 EQ Limitorque operators on January 17, 1986. By the beginning of March 1986, walkdown inspections had been completed on 27 valves and by the end of March, 55 operators had been inspected. Five of the remaining nine operators were completed shortly after the March 1986 outage. Walkdown inspections on the remaining four operators were completed on June 19, 1986. When unidentified wire was identified, it was replaced with documented Rockbestos SIS wire, qualified for use in all harsh environments at Waterford 3, documented in EEQD 6.3 and 6.3A. Representative sampling of wires were removed from the operators as a result of the walkdown inspection program, and tested under simulated accident conditions. The applicable test conditions enveloped the outside containment accident environment. No unidentified wiring was identified in operators located inside containment. LP&L maintains that test results on the unidentified wiring removed is available and that harsh environment accident conditions would not have negated valve operator functions. The test results of the unidentified wiring removed during LP&L's walkdown inspection program, between November 30 1985, and June 19, 1986, should be fully documented to support qualification and placed in the EQF. This item will be evaluated during a subsequent NRC inspection and is considered a Potential Enforcement/Unresolved Item (50-382/8632-05).

(7) EEQD 14.1/52.1, BIW Cable Assembly

- (a) The qualification criteria for this file is NUREG 0588, Category II. The EQF contains an Isomedix test report on radiation aging performed for Litton Precision Products. The EEQD 14.1/52.1 is intended to qualify a connector and flex conduit in addition to the cable.

Appendix II contained in EEQD 14.1/52.1 included an EBASCO memo describing the thermal lag analysis done on the assembly. The analysis indicates that the silicone potting compound may be subjected to temperatures as high as

404° F. The EQF does not address the effects of this temperature on the complete cable/connector assembly whose qualification temperature only qualifies to 340°F for a MSLB accident. The EEQD 14.1/52.1 for the BIW cable assembly contained information showing that the silicone potting compound degradable material had temperatures during an MSLB exceeding this qualification temperature, and no analyses to meet the staff requirements of NUREG-0588, Category II, paragraph 1.2(5), was contained in this file. The NRC staff requirements ask for documentation in the file to demonstrate that the MSLB test conditions exceed those postulated for the accident particularly in regards to the surface temperature of the equipment. The staff requires this additional justification documented in the file to demonstrate its required functional operability.

The licensee's letter to NRC Region IV, dated February 2, 1987, provides an additional test report No. 558-1654 performed by National Technical Systems in which the test accident profile envelopes the MSLB temperature peak. The NTS test report now contained in EQF, EEQD 14.1/52.1 will be evaluated during a subsequent NRC inspection. This item is considered Potential Enforcement/Unresolved Item (50-382/8632-06).

- (b) The EQMI for the BIW cable assembly, contained in the EQF, identified an area in the plant where the installed assemblies would be subjected to a service temperature that exceeds the manufacturer's temperature rating. This does not meet NUREG-0588, Category II, 4(2) requirements for periodic replacement of equipment susceptible to aging effects. The qualification documentation in the EQF should address aging to the extent that equipment with materials susceptible to aging effects should be identified, and a schedule for periodically replacing this component/material should be established.

Components identified in the EEQD 14.1/52.1 BIW cable assemblies were located in an elevated service temperature environment and no replacement schedule had been established. Only an inspection program to monitor degradation on 18-month intervals was in effect. A component replacement schedule is required, based on an air temperature measured close to the connector assemblies. LP&L is in the process of determining a replacement for these assemblies on the RVH and will revise the file and EQMI accordingly.

This item is considered a Potential Enforcement/Unresolved Item (50-382/8632-07).

(8) EEQD 15.1, Conax Electrical Penetrations, Model 7320
10,000 Series

The qualification criteria for this EQF is NUREG-0588, Category I. The EEQD uses the following Conax test reports to establish qualification: (1) No. 596, Low Voltage Power, Control and Instrumentation; (2) No. 607, Medium Voltage; and (3) No. 700, Personnel Air Lock.

- (a) The test reports above, in the EQF, reference Conax report ISP-568 to support qualification in that the internal temperature of the penetration will not exceed the saturation temperature of the steam during the maximum temperature excursion for the MSLB. This report was not available in the EQF for review.
- (b) The above test reports list an acceptance criteria for IR measurements of 1×10^8 ohms for terminal blocks. There was no documentation in the EQF to show that the plant specific functional performance requirements were satisfied. The analysis which shows application of the type test configuration to the installed configuration was missing in the EQF.
- (c) The EQMI requires an analysis of the Kulka terminal blocks with respect to IN 84-47 (EQ LOCA/MSLB tests conducted on electrical terminal blocks at Sandia National Laboratories in which a moisture film formed on the surface and resulted in degraded IR measurements between terminal points and ground). There is no indication in the EQF, EEQD 15.1 that this analysis was accomplished. The analysis in the EQF was missing.

The licensee's letter to NRC Region IV, dated February 2, 1987, provides further corrective action with respect to (a) above in that report IPS-568 has been placed in EQF, EEQD 15.1, and may be reviewed. Also with respect to (b) above, the licensee indicates the missing evaluation associated with IR measurements, which shows application of the test configuration to that installed, addressed in LP&L letter W3B87-0222 dated February 3, 1987, is now placed in the EQF and may be reviewed. With respect to (c) above, the licensee's response to IEN 84-47 has been addressed in LP&L letter W3B87-0222, and also may be reviewed in the EQF. LP&L, in letter W3B87-0222, indicates that the terminal blocks in question during the NRC inspection installed in Conax electrical penetrations are utilized for non-IE circuits with the exception of those used for reactor vessel core exit thermocouples. The EQF, EEQD 15.1 should identify subassemblies, components, and parts which are not required to be EQ-qualified in the electrical penetration assembly.

The above items (a), (b), and (c) will be evaluated during a subsequent NRC inspection and are considered an Open Item (50-382/8632-08).

(9) EEQD 6.2/16.2, Okonite 5KV Cable and Splices

The EQF, EEQD 6.2/16.2 is set up to qualify Okonite Okoguard insulated cables and No. T95 Okonite splices used with No. 35 splicing tape. The qualification criteria for this file is NUREG-0588, Category I. The EQF uses Okonite test report NQRN-3 to support qualification.

- (a) The EQF, contains a thermal lag analysis for the DBE accident that takes credit for the cable jacket. The file does not indicate the jacket material for the installed cable. The type test cable and splices were not jacketed. It did not appear, during the NRC inspection, that the thermal lag analysis was applicable.

The licensee's letter to NRC Region IV, dated February 2, 1987, provided additional information with regard to the qualification of the installed jacketing material on Okonite cables. Qualification by similarity to the jacketing material on Samuel Moore cables used at Waterford 3 has now been established, referencing EEQD 6.8 in the EQF, EEQD 6.2/16.2 files. The licensee now maintains qualification is established and credit can be taken for the thermal lag analysis. The analysis and qualification documentation of EEQD 6.8, with regard to jacketing qualification will be evaluated during a subsequent NRC inspection.

- (b) Also EQF, EEQD 6.2 contains a statement requiring verification that the installed cable service temperature, including internal heat rise, remain below 90°C. There is no indication in the file that this verification has been accomplished. LP&L accepted an EBASCO engineering judgement that both splices and cable are thermally protected by the cable tray enclosures and therefore no requirement for verification was needed. During the inspection, LP&L indicated that this verification statement should have been removed from the EQF, EEQD 6.2. An analysis to justify negating the verification requirement is required in the EQF, and will be evaluated during a subsequent NRC inspection.

Items (a) and (b) above are considered an Open Item (50-382/8632-10).

(10) EEQD 39.3, Rosemount Resistance Temperature Detectors (RTDs)
Model 104-1619-6

These RTDs monitor reactor coolant temperatures and send input signals to the core protection calculators. The qualification criteria for this file is NUREG 0588, Category II. At the time of the NRC inspection, the file indicated that these RTDs were required to be qualified for submergence, but file documents demonstrated they were not tested for submergence. During the NRC inspection, the licensee showed that these instruments are located above the flood level of -1.2 feet mean sea level and do not require submergence qualification. The licensee's letter to NRC Region IV, dated February 2, 1987, provided corrected pages to EEQD 39.3 showing the submergence requirement for EQF, EEQD 39.3 rescinded. This file will be reviewed during a subsequent NRC inspection and is considered an Open Item (50-382/8632-11).

(11) EEQD 6.6, BIW Coaxial Cable

The qualification criteria for this file is NUREG-0588, Category I. The file uses the BIW test report B912 with supplemental documentation from the Franklin test report F-C3859-1. The cable is used for the neutron detector wiring to the control room. The NRC inspection team determined that the current and voltage levels utilized by this cable in its application at the Waterford 3 plant are not those used in the same range during the generic type test. A significantly lower level is required for the plant specific application. A separate calculation in the EQF would normally be required to address the functional performance of the BIW coaxial cable used in the plant specific application for EQ qualification.

However, the licensee's letter to NRC Region IV, dated February 2, 1987, identifies the BIW coaxial cables as non-EQ-qualified, in that LP&L claims no requirement for this cable to survive the LOCA/MSLB accident.

The EQF, EEQD 6.6 should identify subassemblies, components, and parts which are not required to be EQ-qualified, with regard to the excore neutron monitoring system, and will be evaluated during a subsequent NRC inspection and is considered an Open Item (50-382/8632-12).

(12) EEQD 6.1, Okonite 600 VAC Cable

The qualification criteria for this file is NUREG-0588, Category I. The EQF uses the Okonite test report NQRN-1.

(a) The file includes a thermal lag analysis for Okonite 600 VAC cable during a DBE accident. The thermal lag

analysis is a generic document and should be evaluated on a case-by-case basis. The analysis is used to show that the short duration peak temperature of 414°F will not cause equipment and cable to heat up above the test temperature of 340°F. No credit is taken for the mitigating effects of cable tray, or conduit, in this calculation. However, credit is taken for the cable jacket. For cables, the temperature rise associated with the peak temperature is shown to be acceptable below the cable jacket thickness. The type test report must demonstrate documented jacket performance during thermal and radiation service life aging to ensure its integrity prior to survival of the DBE accident simulation.

Test report NQRN-1 does not identify the jacket conditions at the conclusion of the thermal and radiation service life aging. The thermal lag analysis should reference documented service life aging results of the cable.

The licensee letter to NRC Region IV, dated February 2, 1987, indicated that the jacketing material on Okonite 600VAC cable has been qualified by similarity to the jacketing material on Samuel Moore cables used at the Waterford 3 plant, qualified as demonstrated in EQF, EEQD 6.8. This vindicates credit for the thermal lag analysis approach found in the EQF, EEQD 6.1 for Okonite 600 VAC cable.

The analysis and qualification documentation of EEQD 6.8, with regard to jacketing qualification, will be evaluated during a subsequent NRC inspection.

- (b) Submergence, including demonstration of acceptable IR measurements during post submergence voltage withstand tests are contained in a separate test report. The test report is not referenced in the file. This item is a documentation deficiency.
- (c) The EEQD 6.1 references a test report to support the cable temperature rise due to ampacity heating of the cable. The report document is not in the file. This is a documentation deficiency.

The above items (a), (b), and (c) are considered an Open Item (50-382/8632-13).

(13) EEQD 6.3 and 6.3.A, Rockbestos Firewall III Cable

The qualification criteria for this file in NUREG-0588, Category I. The file uses Rockbestos test reports QR-5804 (chemically XLPE), QR-5805 (irradiated XLPE) and TR-6801

(similarity analysis). A letter from Rockbestos indicates which qualification reports are applicable to each respective shop order. Both the chemically and irradiated XLPE cables are qualified for a 40-year life at the worst case accident profile conditions and are therefore interchangeable. The Waterford 3 pull card system maintains records of cable identification and location within the plant.

No Potential Enforcement/Unresolved Items or Open Items were identified.

(14) EEQD 8.3C, General Atomic Radiation Detector, Model RD-23, UNID No. ARM-IRD-5400AS

The above detector is located outside containment and is used as an area radiation monitor for the reactor building. The Waterford 3 plant considers the detector qualified to 10 CFR 50.49. Qualification will be established when the EQF, EEQD 8.3C is upgraded to reflect the correct Rockbestos test report and performance data for the BIW coaxial cable used in the reactor building area radiation monitoring system. The licensee letter to NRC Region IV, dated February 2, 1987, indicated this information has been placed in the EQF, and will be reviewed during a subsequent NRC inspection. This item is considered an Open Item (50-382/8632-18).

g. IE Information Notices and Bulletins

The NRC inspector team evaluated the licensee's activities related to the review of EQ-related IENs and IEBs. The NRC inspection team review included examination of the licensee's procedures and EQ documentation files relative to IENs and IEBs. The procedures reviewed determined that the licensee does have a system for distributing, reviewing, and evaluating IENs and IEBs relative to equipment within the scope of 10 CFR 50.49 (refer to paragraph 4.b).

During the review of the licensee's EQF, however, the inspection team identified one concern regarding the licensee's implementation of IEN 84-47 involving EQ LOCA/MSLB tests on electrical terminal blocks. This concern is identified in paragraph 4.f(8)(c) of this report, with regard to the EEQD 15.1 documentation review by the NRC inspection team.

By letter dated September 26, 1984, the applicant informed the staff that IENs 82-03, 82-52, 83-45 and 83-72, which are related to equipment environmental qualification, have been addressed. LP&L explicitly tracks the resolution of IENs, IEBs, and IE circulars.

The NRC inspection team evaluations with respect to each IEN are addressed under the paragraphs of this report, related to each EQF, EEQD (paragraph 4.f) and each component/equipment (paragraph 4.h)

reviewed or physically inspected by the team. Also, background information pertaining to the Waterford 3 plant, in regard to IENs and IEBs, are addressed in paragraph 3 of this report.

h. Plant Physical Inspection

The NRC inspection team, with the required tagging out of operation selected equipment and components by the licensee, walked down and physically inspected approximately 24 components/equipment for the Waterford 3 plant. The inspection team examined attributes and characteristics such as mounting configurations, orientation, interfaces, ambient environment, physical condition, and verified traceability of equipment identified in the EQF by model and serial numbers.

During the NRC walkdown inspection, the NRC inspection team identified the Potential Enforcement/Unresolved Items and Open Items described below:

(1) Limatorque Motor Operators, Series SMB, Okonite V-Type Taped Cable Splices

During the NRC walkdown inspection, motor lead splices in the above Limatorque operators were observed. The splices were Okonite V-type taped splices. The Okonite V-type taped splice documentation was found in EQF, EEQD 6.2/16.2; however, the file did not adequately support qualification to demonstrate similarity between the type tested splices and those installed. LP&L's letter to NRC Region IV provided an additional test report No. PEI-TR-82-4-29 which addresses the V-type taped Okonite splice configuration installed at Waterford 3. This item will be evaluated during a subsequent NRC inspection.

This item is considered an Open Item (50-382/8632-19).

(2) UNID No. CVC-EMTR-31AB-4C1, EFW-EMTR-3B-2A, and SI-EMTR-3AB-3A, General Electric Motors (Model No.'s 5K6404AK238V and 5K811045C25), and Seimens-Allis Motor (Model No. 113)

During the NRC walkdown inspection, cable splices to the above motors were observed. The qualification basis for these motors is NUREG 0588, Category I. The above motor and heater connections were installed using (1) Okonite in-line butt splices; (2) Okonite V-type taped motor connection splices; and (3) Okonite bolted splices for motor heater applications.

- (a) The Okonite in-line bolt splices, used for motor power connections of GE motor UNID No. CVC-EMTR-31AB-4C1, were fully supported by documentation in the EQF, EEQD 6.2/16.2.

- (b) The documentation for Okonite V-type taped motor connection splices, used for power connections on General Electric (GE) motors UNID No. EFW-EMTR-3B-2A, SI-EMTR-3AB-3A, were found in the EQF, EEQD 6.2/16.2, 4.3, and 4.12. However, the documentation file did not adequately support qualification to demonstrate similarity between the type tested splices and those installed. LP&L's letter to NRC Region IV provided an additional test report No. PEI-TR-82-4-29 which addresses the V-type Okonite splice configuration installed at Waterford 3. This item will be evaluated during a subsequent NRC inspection (refer to paragraph 4.h(1) of this report). This item is considered an Open Item (50-382/8632-19).
- (c) Also, the Okonite bolted type splices for heater connections on GE motor UNID No. CVC-EMTR-31AB-4C1, contained no supporting qualification documentation in the EQF, EEQD 6.2, 16.2, or 4.14. The EQF for the above G.E. CVC charging pump motors do not adequately establish qualification because of failure to demonstrate similarity between the type tested nuclear qualified motor connection splices and the Okonite bolted type taped splices installed at the Waterford 3 plant. Lack of qualification documentation in the file is considered a Potential Enforcement/Unresolved Item (50-382/8632-03).

(3) UNID No. SI-MVAAA-331A, Limitorque Motor Operators, Series SMB-2, Improper Installation/Inadequate Maintenance of Okonite V-type Taped Cable Splices

During the NRC walkdown inspection, it was observed that the Okonite V-type taped cable splices on motor leads inside Limitorque operator SI-MVAAA-331-A were in contact with the limit switch compartment energized space heater and that the tape had begun to deteriorate.

The licensee's letter to NRC Region IV, dated February 2, 1987, indicated that the LP&L Waterford 3 maintenance department had performed corrective action.

This item is considered an Open Item and will be closed out during an NRC subsequent inspection (50-382/8632-20).

(4) UNID No. CB-EPEN-316-142 and CB-EPEN 316-117, Conax Electrical Penetrations, Model No. 7320-10003-02

- (a) During the NRC walkdown inspection, the team observed the outside containment penetration CB-EPEN316-142 had two small terminal blocks located at the 4 and 8 o'clock positions close to the containment wall which were unidentified. Terminations to this penetration were made

using these two unidentified terminal blocks. The terminal blocks observed could not be identified as to manufacturer and model, and EQF, EEQD 15.1 did not contain documentation to demonstrate similarity between any type test and these installed components. The licensee's letter to NRC Region IV, dated February 2, 1987, indicated these terminal blocks were initially installed for measuring internal temperature of the penetrations containing power cables, and are classified as nonsafety-related, non-EQ qualified.

LP&L should completely identify components by description (list, etc.) in the EQF, EEQD 15.1 to clarify what subassemblies, parts, and components to the model 7320-10003-02 electrical penetrations are considered EQ qualified, as this equipment appears as only one item on the EQML-E. LP&L should fully identify and document that these terminal blocks are not part of the penetration assembly that requires qualification. This item is considered an Open Item (50-382/8632-23).

- (b) During the NRC walkdown inspection, the team also observed that the outside containment penetrations CB-EPEN 316-117 and CB-EPEM 316-142, had the polysulfone ends on the modules cracked with pieces of some ends missing and displayed damage. LP&L indicated during the NRC inspection that an engineering evaluation of the problem had been performed but no results or conclusion had been finalized or documented. The licensee's letter to NRC Region IV, dated February 2, 1987, provided additional information with regards to cracked polysulfone resilient seals. LP&L's electrical penetration generic problems and resolutions had been documented on March 9, 1984, as discussed with the Conax field service engineer. This documentation is now in EQF, EEQD 15.1 and may be reviewed. This item is considered an Open Item (50-382/8632-09).

(5) UNID No.'s ESF-IPT-6750A and CS-IDPT-5158-A, Rosemount 1153 Series A Pressure Transmitters

Pressure transmitters UNID Nos. EFS-IPT-6750-A and CS-IDPT-5158-A were physically examined during the NRC plant walkdown. UNID No. ESF-IPT-6750A had an RTV plug used as an environmental seal for the electrical conduit connection. Replacement schedules for upgrading the RTV plug seal configuration to a Rosemount conduit seal configuration as tested were not found in the EQF, EEQD 8.1.

The licensee's letter to NRC Region IV, dated February 2, 1987, identified station modification No. 1675 currently being implemented during the Waterford 3 first refueling outage, in which qualified Rosemount No. 353C environmental conduit seals

were replacing RTV plug seals. An LP&L walkdown inspection had been completed to confirm the current status of installations required to implement replacement seals to station modification No. 1675.

The EQF, EEQD 8.1 will be reviewed in an NRC subsequent inspection. This item is considered an Open Item (50-382/8632-14).

(6) UNID No. RC-IDPT-9116-SMB, ITT Barton, Model 763/764 Pressure Transmitters

The EQF, EEQD 8.2A for ITT Barton model 763 and 764 pressure transmitters was examined by the NRC inspection team. Component RC-IDPT-9116-SMB was physically examined during the NRC plant walkdown. An RTV environmental seal plug was used for the electrical conduit connection. Replacement schedules for upgrading the RTV plug seal configuration to either Namco, BIW, or Rosemount conduit seal configurations as tested, were not found in the EQF, EEQD 8.2A.

The licensee's letter to NRC Region IV, dated February 2, 1987, indicated that LP&L has recently reviewed the qualification requirements for ITT Barton model 763 and 764 pressure transmitter installations at Waterford 3, and concluded these instruments do not require conduit seals. The analysis has been placed in the EQF.

The LP&L analysis which demonstrates that conduit seals do not apply will be reviewed by the NRC during a subsequent NRC inspection. This item is considered an Open Item (50-382/8632-15).

(7) UNID No. SI-EMTR-3B-3A and SI-EMTR-3AB-3A, Seimens-Allis HPSI Motors Model 113

The above motors were inspected during the NRC plant walkdown and physical inspection and the following deficiencies were noted:

- (a) For UNID No SI-EMTR-3B-3A, the forward bearing oil reservoir fill hole was not plugged as required, and ventilation covers had missing screws.
- (b) For UNID No. SI-EMTR-3AB-3A, the rear ventilation screen cover was loose and no mounting screws were installed.

The licensee's letter to NRC Region IV, dated February 2, 1987, stated that corrective actions have been performed.

The above items (a) and (b) will be reviewed during a subsequent NRC inspection and are considered an Open Item (50-382/8632-16).

(8) UNID No. CS-EMTR-3B-5, Allis Chalmers Motors, Model 500P56

The above motor was inspected during the NRC plant walkdown and physical inspection, and the following deficiencies were noted:

- (a) There was evidence of a slight amount of oil leakage from both motor bearing reservoirs.
- (b) The air intake filter hold down plate was not installed.

The licensee's letter to NRC Region IV, dated February 2, 1987, stated that corrective actions have been performed.

The above items (a) and (b) will be reviewed during a subsequent NRC inspection and are considered an Open Item (50-382/8632-17).

5. Exit Interview

An exit interview was conducted on December 12, 1986, at the conclusion of the onsite inspection, with LP&L in which the scope of the inspection and findings were summarized.

INSPECTOR'S REPORT

Office of Inspection and Enforcement

JOHNSON, A.R.

REVIEWER

IRELAND, R.E.

INSPECTORS

JOHNSON A.R.; IRELAND R.E.; NORMAN D.E.; BESS J.E.;
MOIST R.; GROSSMAN J.; FEHRINGER J.; STOFFEL J.; HEISHMAN R.

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			NO. 8632	SEQ. A	MO.	YR.
		1	2	14	15	18

PERIOD OF INVESTIGATION / INSPECTION						INSPECTION PERFORMED BY						ORGANIZATION CODE OF REGIO 1/HQ CONDUCTING ACTIVITY (See IEMC 0530 "Manpower Reporting - Weekly Manpower Reporting" for code.)					
FROM			TO			1 - REGIONAL OFFICE STAFF			OTHER			REGION		DIVISION		BRANCH	
MO	DAY	YR.	MO	DAY	YR.							4		2		1	
12	08	86	03	13	87												
20	25	26	31			52						33		34		35	

REGIONAL ACTION (Check one box only)				TYPE OF ACTIVITY CONDUCTED (Check one box only)											
1 - NRC FORM 591				<input checked="" type="checkbox"/> 02 - SAFETY			06 - MGMT. VISIT			10 - PLANT SEC.			14 - INQUIRY		
2 - REGIONAL OFFICE LETTER				03 - INCIDENT			07 - SPECIAL			11 - INVENT VER			15 - INVESTIGATION		
				04 - ENFORCEMENT			08 - VENDOR			12 - SHIPMENT/EXPORT					
				05 - MGMT. AUDIT			09 - MAT ACCT.			13 - IMPORT					
36				37-38											

INSPECTION / INVESTIGATION FINDINGS (Check one box only)				TOTAL NUMBER OF VIOLATIONS AND DEVIATIONS				ENFORCEMENT CONFERENCE HELD				REPORT CONTAIN 2,790 INFORMATION				LETTER OR REPORT TRANSMITTAL DATE					
A	B	C	D													NRC FORM 591 OR REG. LETTER ISSUED		REPORT SENT TO HQ FOR ACTION			
<input checked="" type="checkbox"/>																MO. DAY YR.		MO. DAY YR.			
																04/16/87					
39				40-41				42				43				44		49 50		55	

MODULE INFORMATION										MODULE INFORMATION															
REC ORD	MODULE NUMBER INSP				PRIORITY	DIRECT INSPEC. EFFORT IN STAFF HOURS EXPENDED THIS INSPECTION	PERCENTAGE COMPLETED TO DATE	STATUS	MODULE REQ. FOLLOWUP				REC ORD	MODULE NUMBER INSP				PRIORITY	DIRECT INSPEC. EFFORT IN STAFF HOURS EXPENDED THIS INSPECTION	PERCENTAGE COMPLETED TO DATE	STATUS	MODULE REQ. FOLLOWUP			
TYPE	NUMBER	PHASE	MANUAL CHAPTER	PROCEDURE NUMBER					LEVEL	SEC	PHASE	MANUAL CHAPTER	PROCEDURE NUMBER	LEVEL	TYPE	NUMBER	PHASE					MANUAL CHAPTER	PROCEDURE NUMBER	LEVEL	SEC
B	01	530	703		A	0.5					B					A									
B	02	525	76c		A	4.37					B					A									
			(TS 2515/76)		B											B									
B	03	525	75c		A	1.2					B					A									
			(TS 2515/75)		B											B									

* CIRCLE SEQUENCE IF VIOLATION OR DEVIATION

INSPECTOR'S REPORT
(Continuation)
 Office of Inspection and Enforcement

DOCKET NO. (8 digits) OR LICENSE
 NO. (BY PRODUCT) (13 digits)

REPORT

MODULE NUMBER

NO

SEQ

VIOLATION SEVERITY
 OR DEVIATION

SITE
 RELATED

SUPL.

1

2

3

4

5

6

D

A C

B D

27

28

29

VIOLATION OR DEVIATION (Enter up to 2400 characters for each item. If the text exceeds this number, it will be necessary to paraphrase. Limit lines to 50 characters each.)

- 1.
- 2.
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