APPENDIX

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

REGION IV

Report: 50-382/81-26

Docket: 50-382 Category A2

Licensee: Louisiana Power and Light Company
142 Delaronde Street
New Orleans, Louisiana 70174

Facility Name: Waterford Steam Electric Station, Unit 3

Inspection at: Waterford Site, Taft, Louisiana

Inspection conducted: September 14-17, 1981

Inspector: _____ 10/8/81
for A. R. Johnson, Reactor Inspector, Engineering and Materials Section — Date

Approved: _____ 10/8/81
R. E. Hall, Acting Chief, Engineering and Materials Section — Date

Inspection Summary

Inspection Conducted on September 14-17, 1981 (Report 50-382/81-26)
Areas Inspected: Routine, unannounced inspection of safety-related construction activities pertaining to installation, inspection, and documentation of Reactor Turbine Generator Control panels; observation of work and review of records for safety-related instrumentation cables; and follow up of a previously identified unresolved item involving an NRR Fire Protection Review and Audit at the Waterford, Unit 3 site conducted September 9-10, 1981. The inspection involved 24 inspector-hours by one NRC inspector.
Results: No violations or deviations were identified.

DETAILS

1. Persons Contacted

Principal Licensee Employees

*L. L. Bass, Project QA Manager
R. G. Bennett, Project QA Engineer
*C. J. Debareaux, Project Construction Coordinator
R. Prados, Technical Services

Other Personnel

*J. Gutierrez, QA Site Supervisor, Ebasco
J. Hernandez, Senior QA Engineer, Ebasco
M. Walsh, Engineering Site Support, Ebasco
F. Brown, QC Electrical Inspector, Fischbach and Moore (F&M)
E. J. Ritzmann, Project QC Manager, F&M

The NRC inspector also interviewed other licensee and contractor personnel including memebers of the engineering and QA/QC staffs.

*Denotes those attending the exit interview.

2. Licensee Action on Previously Identified Inspection Findings

(Open) Unresolved Item (50-382/80-08): Physical Separation of Safety-Related Instrumentation Cables in the Main Control Room Reactor Turbine Generator Control Panels.

During this inspection, the NRC inspector discussed, with the licensee's representative, the physical separation of electrical/instrumentation cabling within the Reactor Turbine Generator Control Panels CP-1, 7, 8, and 18 and compliance with Regulatory Guide 1.75, Revision 2; Industry Standard IEEE-384-1974; and Ebasco Internal Panel and Cable Separation Drawing LOU-1564, B-288. This matter had been previously identified as an unresolved item during NRC Inspection 50-382/80-08 and subsequent follow-up Inspection 50-382/81-14. The licensee's representative, during Inspection 50-382/81-14, had indicated his intent to implement the previously identified separation measures by use of fire barriers, including foam barriers at bottom cabinet entries. The then pending NRR Fire Protection Review and Audit and the licensee's commitments to 10 CFR Part 50, Appendix R were necessary to define these separation requirements.

The NRR Fire Protection Review and Audit was conducted at the Waterford, Unit 3 site on September 9-10, 1981, by Messrs P. Sears (NRC) and R. Bruce (NRC Consultant). The NRC inspector reviewed the exit meeting minutes of September 10, 1981, as recorded by the licensee, and observed that the

above electrical/instrumentation cabling areas in the control panels were not as yet addressed. Discussion and status of the NRR Fire Protection Review and Audit will be included in the NRR CEB trip report, at which time the licensee's commitments to Appendix R will be established, and the requirements for separation barriers resolved.

This matter is still considered unresolved.

3. Safety-Related Instrumentation Cable Terminations Internal to the Reactor Turbine Generator Control Panels

The NRC inspector inspected the Plant Protective System (PPS) Remote Control Panel (CP 7) in the main control room for instrumentation cable routing and termination at the field terminal blocks internal to the panel. This inspection was to assure that field installation was in accordance with Ebasco's Internal Panel and Cable Separation drawings, FSAR commitments, Ebasco specifications/procedures, LP&L procedures, F&M procedures, and industry standards. The NRC inspector traced out the total route of twenty-six safety-related terminating instrumentation cables, from the panel conduit bottom entry through internal wireways and bundles to the appropriate fanning strips/terminal blocks or panel equipment connectors. The cables were checked for proper conduit entry, color coding, wireway installation, wireway routing, identification, correct size, grounding, shielding, and physical separation. The NRC inspector reivewed the quality related records (F&M cable pull and termination slips, QC checklists for cable pulling and cable terminations/splices, and QC system inspection reports) relative to the above twenty-six installed instrument cables, to ascertain whether these records reflect work accomplishment consistent with the established construction procedures.

Six of the above twenty-six safety-related cables inspected by the NRC inspector were vendor prefabricated connector type cables supplied by Combustion Engineering (CE) for purposes of interconnecting the PPS Operators Panel (CP-7) and the PPS Auxiliary Protective Back Panel (CP-22), using the lower cable chase spread area. The six cable assemblies were twenty conductor, twisted pair No. 20 AWG, with overall shield type cable. Each was equipped with 42 pin MS 3057-204 connectors (manufactured by Glen Air, Inc. No. G1513S2020A4A) on both ends. The NRC inspector reviewed the Ebasco Material Receiving Inspection Report (MRIR) and the F&M QC Receiving Inspection Checklist for proper QC sign-off and acceptance. The Combustion Engineering Power Systems "Certification of Equipment" for the Core Protection Calculator System (major components to the PPS Auxiliary Protective Back Panel - CP-22) was also reviewed by the NRC inspector; this included the CE prefabricated cables mentioned above.

During the inspection, the NRC inspector observed that the cable floor penetrations in the bottom of the PPS Panels did not bear the electrical conduit identification markings. F&M's response was that the floor penetrations require no identification marking as they constitute part

of the panel structure. The NRC inspector referred to the FSAR, paragraph 8.3, which does not address the identification marking requirement on floor penetrations, but does address marking requirements for electrical conduit runs. Ebasco Drawing .OU-1564, B-288, Sheet 5, Revision 8 and Construction Procedure CP-301, Revision 4, paragraph 6.6 implement the FSAR requirements in that electrical conduit must be identified (by self-adhesive printed color coded markers) every 50 ft. and at each end when passing through walls and floors. F&M did request clarification via a "Request for Information" (RFI) from Ebasco Site Support Engineering (ESSE) as to whether electrical floor penetrations should be identified by markers. The NRC inspector was satisfied that the licensee had met his commitments and FSAR requirements.

The following safety-related cables for the Plant Protection System (PPS) pulled and terminated by F&M were inspected:

Cable No.

30189N-SMA

30191A-SMA

30189P-SMB

30191C-SMB

30191L -SMB

30191M-SMB

30621G-SMB

30189Q-SMC

30191E-SMC

30194A-SMC

30194B-SMC

30194C-SMC

30194E-SMC

30195E-SMC

30195F-SMC

30189B-SMD

30191Q-SMD

30191R-SMD

30621Q-SMD

30621R-SMD

The following safety-related prefabricated cables by CE for PPS, pulled by F&M were inspected:

Cable No.

30180C-SMA

30189E-SMB

30180F-SMB

30180L-SMC

30180Q-SMD

30180N-SMD

The following F&M QC Checklists for cable pulling (including associated cable pull slips) for PPS were reviewed by the NRC inspector:

QCP-306, 30189N-SMA

QCP-306, 30191A-SMA

QCP-306, 30189P-SMA

QCP-306, 30191C-SMB

QCP-306, 30191L-SMB

QCP-306, 30191M-SMB

QCP-306, 30621G-SMB

QCP-306, 30189Q-SMC

QCP-306, 30191E-SMC

QCP-306, 30194A-SMC

QCP-306, 30194B-SMC

QCP-306, 30194C-SMC

QCP-306, 30194E-SMC

QCP-306, 30195E-SMC

QCP-306, 30195F-SMC

QCP-306, 30189B-SMD

QCP-306, 30191Q-SMD

QCP-306, 30191R-SMD

QCP-306, 30621Q-SMD

QCP-306, 30621R-SMD

QCP-306, 30180C-SMA

QCP-306, 30180E-SMB

QCP 306, 30180F-SMB

QCP-306, 30180L-SMC

QCP-306, 30180Q-SMD

QCP-306, 30180N-SMD

The following F&M QC Checklists for terminations and splices (including associated cable termination worksheets) for PPS were reviewed by the NRC inspector:

QCP-307, 30189N-SMA

QCP-307, 30191A-SMA

QCP-307, 30189P-SMA

QCP-307, 30191C-SMB

QCP-307, 30191L-SMB

QCP-307, 30191M-SMB

QCP-307, 30621G-SMB

QCP-307, 30189Q-SMC

QCP-307, 30191E-SMC

QCP-307, 30194A-SMC

QCP-307, 30194B-SMC

QCP-307, 30194C-SMC

QCP-307, 30194E-SMC

QCP-307, 30195E-SMC

QCP-307, 30195F-SMC

QCP-307, 30189B-SMD

QCP-307, 30191Q-SMD

QCP-307, 30191R-SMD

QCP-307, 30621Q-SMD

QCP-307, 30621R-SMD

The following F&M QC System Inspection Reports for PPS safety-related cables were reviewed by the NRC inspector:

IR No.	Date	Subject
308-57-192	4/14/80	Identification at terminated cables
307-68-225	6/16/80	Seismic qualification of conduit support
307-88-11	2/26/81	B/M call out on Ebasco Drawing R288 - discrepancy/disposition of short prefab cable/redirected cable due to conduit volume
159-71-41	7/19/80	Rerouting of cables inside panel

The following F&M QC Receiving Inspection Checklist for PPS safety-related cable was reviewed by the NRC inspector:

No.	Date	Description
133-6563	2/13/81	Components for CP-22 Plant Protective System Panel (including vendor pre-fabricated cables to CP-7 Operators Remote Panel)

The following Ebasco Material Receiving Inspection Report for PPS was reviewed by the NRC inspector:

No.	Date	Description
MRIR 80-04019	12/17/80	Components for Combustion Engineering Core Protection Calculator System

The following Combustion Engineering Certification of Equipment for PPS was reviewed by the NRC inspector:

Contract No.	Ship No.	Component	Mfg.	Cert. Date
9270	2	Core Protection Calculator System (includes vendor prefabricated cables to CP-7 Operators Remote Panel)	Systems Engr. Labs	6/25/80

The following Ebasco Drawings for PPS were reviewed by the NRC inspector:

Drawing No.	Revision	Title
LOU-1564, B-288, Sheet 10G	0	CP-7 Panel Cable Bundling Details
LOU-1564, B-288, Sheet 10G-1	1	CP-7 Cable Termination Sheets
LOU-1564, B-288, Sheet 10G-2	1	CP-7 Cable Termination Sheets
LOU-1564, B-288, Sheet 10G-3	0	CP-7 Bundling General Notes

The following Ebasco Field Change Request (FCR) for PPS was reviewed by the NRC inspector:

No.	Date	Subject
FCR-E-1915	1/13/80	Physical separation of cable bundles

The following Construction Procedures were reviewed by the NRC inspector:

No.	Rev.	Title
CP-301	4	Installation of Electrical Conduit
CP-306	5	Safety-Related and Non Safety-Related Cable Pulling
CP-307	5	Cable Terminations and Splices

The following Ebasco site Procedures were reviewed by the NRC inspector:

No.	Rev.	Title
ASP-II-2	0	Site Document Control

No violations or deviations were identified.

4. Exit Interview

The NRC inspector met with the licensee representatives (denoted in paragraph 1) at the conclusion of the inspection on September 17, 1981. The NRC inspector summarized the purpose, scope, and findings of the inspection.