

11/11/78

11/11

ENVIRONMENTAL TEST

PROGRAM

FOR

TWENTY-ONE

COMPONENTS

DATE: OCTOBER 30, 1978

REVISION No. 0

PREPARED BY: FRANK MADDEN

Richard M. Mason

QA MANAGER APPROVAL

Frank Madden

PROJECT MANAGER APPROVAL

TEST REPORT NO: 753.1

PAGE NO: 1 of

REVISION NO. 0

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PDR FOIA  
BERNABE84-206 PDR

## 1.0 CUSTOMER

Ebasco Services Incorporated  
Two Rector Street  
New York, New York 10006

## 2.0 TEST SPECIMENS

Twenty - One components  
(See paragraph 5.1 of Appendix 1)

## 3.0 MANUFACTURER

See Paragraph 5.1 of Appendix 1

## 4.0 SUMMARY

Twenty-one components, hereinafter called the specimens, were subjected to a Qualification Test Program to confirm the adequacy of design to perform their required functions under normal and abnormal conditions, as specified herein.

The test program was performed to satisfy the intent of IEEE-323-1971 (Ref. 1) and IEEE 344-1975 (Ref. 2)

It was demonstrated that the specimens possessed sufficient integrity to withstand without compromise of structure or electrical function the prescribed simulated environment with the exceptions given in Appendix 1.

## 5.0 TEST REQUIREMENTS

The specimens, as described by Appendix 1, paragraph 5.1, were subjected to a series of Environmental extreme test to allow their use in a nuclear facility. These tests included radiation exposure to  $1 \times 10^4$  rads, seismic simulation, and combined temperature and humidity exposure.

### 5.1 RADIATION

The specimens were subjected to  $1.0 \times 10^4$  rads using cobalt 60. This was performed to a dose rate of  $1.92 \times 10^2$  rad/minute for a period of 52 minutes. Certification to this is provided in Appendix 2.

### 5.2 SEISMIC SIMULATION

The specimens were subjected to biaxial sine beat tests at one-third octave intervals over the frequency range of 1 hz. to 35 hz. The tests were performed with the input in both the in-phase and out-of-phase conditions. The input acceleration was 2.8g horizontally and 2.1g vertically within the limits of the Wyle Laboratories test machine.

## 5.2 CONDT.

The mounting configuration, electrical power and monitoring are as given in Section 5.0 of Appendix 1.

## 5.3 ENVIRONMENTAL TESTS

The specimens were subject to an environment of 57°C (120 + 15°F) at 95% ± 5% relative humidity. The specimens were maintained in this environment for a period which exceeded the required forty-eight (48) hour period.

## 6.0 RESULTS

### 6.1 RADIATION EXPOSURE

The specimens continued to function after being subjected to the prescribed radiation dose. There was no apparent degradation in structure. Electrical functions continued to perform without compromise.

### 6.2 SEISMIC SIMULATION

The specimens completed the seismic test without compromise of structure. Items 1 through 11 and Items 17 through 21 possessed sufficient electrical integrity to withstand the prescribed simulated seismic environment.

Contact chatter of one millisecond or greater was recorded on Items 12, 13, 14, 15 and 16 during testing in the FB/V axes and, on Items 13, 14, 15 and 16 in the SS/V axes, as described in Table I, Appendix I.

### 6.3 ENVIRONMENTAL

The specimens completed the prescribed environment without compromise in either the structure or electrical function.

APPENDIX I

WYLE TEST REPORT 44258-1

Appendix I

Wyle Test Report 44258-1

Appendix II

Georgia Institute of Technology  
Certification Letter dated September 21, 1978

Appendix III

Reliance Electric Company  
Electrical Test Inspection Report  
Functional Test Dated 10-30-78

Appendix IV

Reliance Electric Company  
Environmental Test Plan  
Number 753-ET-1, Revision 0

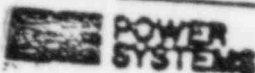
Appendix V

References

# ATTACHMENT IX

C-E Power Systems  
Combustion Engineering Inc.  
1000 Prospect Hill Road  
Bridgewater, Connecticut 06005

Tel: 203/686-1911  
Telex: 9-9297



December 23, 1975  
C-CE-2737

**RECEIVED**

D.C. 11 1975

**R. K. STAMPLEY**

Louisiana Power & Light Company  
Ebasco Services Incorporated, Agent  
Two Rector Street  
New York, New York 10006

Attention: Mr. R. E. Stampley, Project Manager

Subject: NY 603402  
Louisiana Power & Light Company  
Waterford Steam Electric Station, Unit No. 3  
Ebasco Specification

Reference: (A) LKQ-553-74 of August 28, 1974

Gentlemen:

Reference (A) forwarded to CE for review and comment the following Ebasco specification revisions:

<u>Spec. No.</u>	<u>Title</u>
LOU-1564.279 Rev. 1	125V Distribution Panels (Class 1E)
LOU-1564.280 Rev. 2	Storage Battery (Class 1E)
LOU-1564.280B Rev. 2	Battery Charger (Class 1E)

CE has reviewed these revisions and has no comment on the changed sections.

Specification LOU-1564.282 Rev. 2, also forwarded by reference (A), was commented upon along with revision 3 in C-CE-2682 dated December 8, 1975.

Very truly yours,

*A. L. Williams*  
A. L. Williams  
Project Manager

R.G./JGR/18  
C-1PE-448

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