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 FACIL: 50-335 St. Lucie Plant, Unit 1, Florida Power & Light Co. 05000335
 AUTH. NAME: UHRIG, R. E. AUTHOR AFFILIATION: Florida Power & Light Co.
 RECIP. NAME: CLARK, R. A. RECIPIENT AFFILIATION: Operating Reactors Branch 3

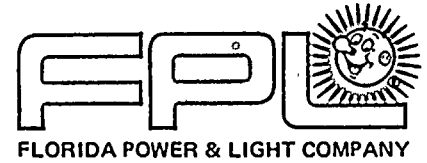
SUBJECT: Responds to 830711 request for addl info on Items 104-108 & 113-116 of Franklin Research Ctr evaluation re: environmental qualification of safety-related electrical equipment. Replacement transmitter info encl.

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 TITLE: OR/Licensing Submittal: Equipment Qualification

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August 15, 1983.
L-83-448

Office of Nuclear Reactor Regulation
Attention: Mr. Robert A. Clark, Chief
Operating Reactors Branch #3
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Clark:

Re: ST. LUCIE UNIT 1
DOCKET NO. 50-335
ENVIRONMENTAL QUALIFICATION
OF SAFETY-RELATED ELECTRICAL EQUIPMENT

In response to your letter dated July 11, 1983, please find the attached additional information concerning item numbers 104, 105, 106, 107, 108, 113, 114, 115, and 116 of the Franklin Research Center's Technical Evaluation Report. Attachment #1 supplies additional information regarding the replacement transmitters mentioned in our letter L-83-285, dated May 5, 1983. Attachment #2 provides additional justification for continued operation of item #114.

Should you or your staff have any questions regarding this information, please contact us.

Very truly yours,

Robert E. Uhrig for
Robert E. Uhrig
Vice President
Advanced Systems and Technology

REU/ RJS

Attachment

8308190098 830815
PDR ADCK 05000335
PDR

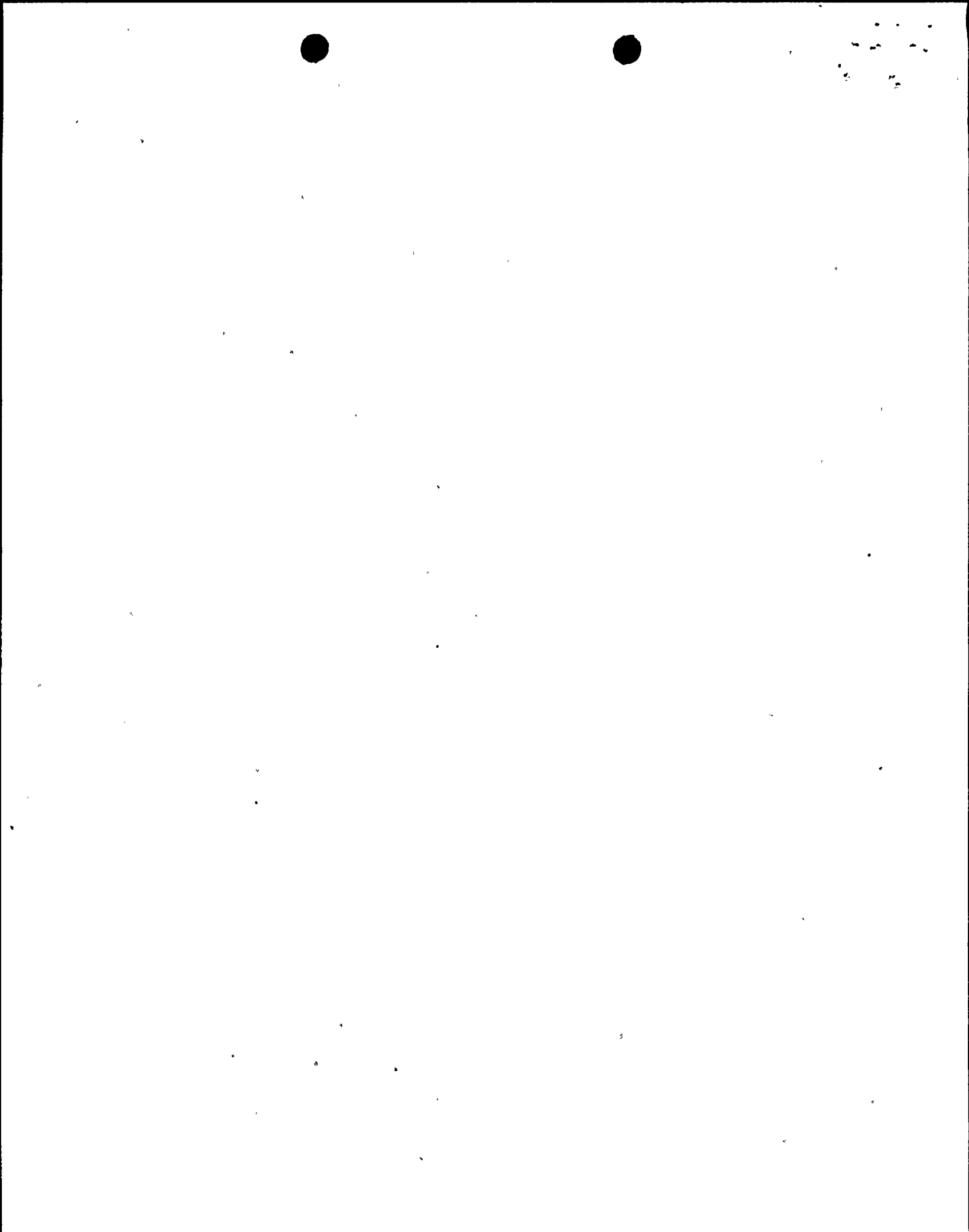
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ATTACHMENT #1

<u>Franklin Research Center's TER Item No.</u>	<u>Replacement Rosemount Transmitter Model No.</u>
104	1153-DD-4
105	1153-DD-4
106	1153-DD-4
107	1153-GD-9
108	1153-GD-9
113	1153-GD-9
115	1153-GD-9
116	1153-GD-9

Summary of Qualification

A complete test report on the above mentioned transmitters is expected from the vendor in the near future. The test report will comply with IEEE-323-1974 and IEEE-344-1975. A draft report is presently available and under review by FP&L.



ATTACHMENT #2
ADDITIONAL INFORMATION
CONCERNING SAFETY CATEGORY
II.B ITEM #114

By letter dated April 12, 1983, the NRC staff provided FPL with a Technical Evaluation Report (TER) for the Environmental Qualification of Safety-Related Electrical Equipment for St. Lucie Plant, Unit No. 1. The TER identified deficiencies in the environmental qualification documentation associated with a Fisher and Porter (F & P) transmitter that is used to monitor containment pressure. By letter dated May 5, 1983, FPL provided justification for continued operation for this piece of equipment. The NRC letter of July 11, 1983 subsequently requested additional information regarding the qualification of this transmitter. The response to this NRC request is provided below.

The F & P transmitters provide input to:

- . Containment Isolation Signal (CIS)
- . Safety Injection Actuation Signal (SIAS)
- . Containment Spray Actuation Signal (CSAS)
- . Reactor Trip

These functions except for CSAS, are also initiated by:

- . Thermal Margin/Low Pressure (low reactor coolant system pressure) - reactor trip
- . Pressurizer Pressure - SIAS
- . High Containment Radiation - CIS

The required protective functions associated with the transmitters occur early in the containment pressure-temperature transient. The ≤ 5 psig set point for large breaks occurs immediately after the postulated pipe break (see FSAR @Figure 6.2-2A), and for a small break in about 10 seconds (see FSAR @Figure 6.2-11A for a 0.5 ft.² break). Thus, it is reasonable to conclude that the F & P transmitters will perform their safety function prior to being exposed to significantly harsh environment since:

- (1) The safety function is completed at the very onset of the containment pressure-temperature transient.
- (2) The safety function initiates containment spray, thus the chemical spray environment occurs after execution of the safety function
- (3) Significant radiation release would occur after failure of the Safety Injection System, which is placed in service by the F & P transmitters. A radiation environment of significance is not associated with the safety function.

The operator is also provided with control room containment pressure indication (indication & recording) that derives its signal from two pressure transmitters located outside the containment. Thus, the operator has containment pressure monitoring capability that is independent of the F & P transmitters.

The qualification test of the F & P transmitters is provided in Appendix 3A of the FSAR. The devices installed at St. Lucie 1 are identical with regard to the component parts affected by the harsh environment and the seal. Thus, the qualification tests provided in the FSAR are applicable to the in situ devices.

The qualification test consisted of subjecting the transmitter to a saturated steam environment as follows:

- . 75 psig & 320°F for 1 hour
- . 45 psig & 292°F for 1 3/4 hrs.
- . 5 psig & 228°F for 3 1/2 hrs.

The large break LOCA yields a peak pressure of about 38 psig and 260°F (see FSAR figures 6.2-1A & 1C). The main steam line break peak pressure is about 42 psig and 290°F (see Figures 6.2-12 & 14). Even though the F & P transmitters function before these conditions occur, the qualification test performed for pressure and temperature envelopes the calculated containment conditions with considerable margin.

The F & P transmitters were tested for a radiation environment. The transmitter tested was a different model than the one tested for the steam pressure-temperature environment, but has identical radiation sensitive components. The tests conclude that the instrument should function satisfactory for a total dose up to 1×10^8 rad at a rate not to exceed 5×10^6 rads/day. The dose requirement is 7.6×10^5 rad for the first 15 minutes and the dose rate doesn't exceed 2×10^6 r/hr. for the first 24 hours (see FSAR @Table 3.11-1 & FSAR Page 5.11-7).

The test sequence of radiation and pressure-temperature testing is of interest but not pivotal to the issue of F & P transmitter qualification, since the instrument will not be exposed to a significant radiation environment when it is required to perform its safety function.

Aging degradation has been considered by analyzing failure rate data, using Arrhenius methodology and other appropriate evaluation methods. The analyses indicates that the aging phenomenon will not alter the conclusions to be reached based on the relevant pressure-time and radiation test data provided above.

Therefore, even though the F & P tests results are not in exact accordance with NRC guidelines, it has been shown that the transmitters will function with the proper accuracy in the event of an accident.