REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR:8306140111 DOC.DATE: 83/05/26 NOTARIZED: NO DOCKET #
FACIL:50-389 St. Lucie Plant, Unit 2, Florida Power & Light Co. 05000389
AUTH.NAME AUTHOR AFFILIATION
UHRIG,R.E. Florida Power & Light Co.
RECIP.NAME RECIPIENT AFFILIATION
EISENHUT,D.G. Division of Licensing

SUBJECT: Forwards list of equipment, justifications for interim operation & response to request for addl info re 10CFR50.49 equipment qualification program. See ltr

DISTRIBUTION CODE: A048S COPIES RECEIVED:LTR 1 ENCL 1 SIZE: 8+112
TITLE: OR/Licensing Submittal: Equipment Qualification

NOTES:

	RECIPIENT ID CODE/NAME		COPIES LTTR	COPIES ENCL	RECIPIENT ID CODE/NAME		COPIES LTTR	COPIES ENCL
	LIC BR #3 BC	12	1	0	NERSES,V.	01	1	1
INTERNAL:	ELD/HDS2	12	1	1	GC	13	1	1
	IE FILE	09	1	1	NRR CALVO,J		1	1
	NRR/DE/EQB	07	2	2	NRR/DL DIR	14	1	1
	NRR/DL/ORAB	06	1	1	NRR/DSI/AEB		1	1
	REG FILE	04	1	1	RGN2		1	1
EXTERNAL:	ACRS	15	8	8	LPDR	03	1	1
	NRC PDR	02	1	1	NSIC	05	1	1
	NTIS	31	1	1				

TOTAL NUMBER OF COPIES REQUIRED: LTTR 25 ENCL 24

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]

P. O. BOX 14000, JUNO BEACH, FL 33408

FLORIDA POWER & LIGHT COMPANY

May 26, 1983
L-83-329

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

Dear Mr. Eisenhut:

Reference: ST. LUCIE UNIT NO. 2
DOCKET 50-389
EQUIPMENT QUALIFICATION PROGRAM
10 CFR 50.49 EQUIPMENT LIST

Attachments: I) List of Equipment as required per 10 CFR 50.49.

II) Justifications for Interim Operation required per 10 CFR 50.49.

III) Response to request for additional information.

Florida Power & Light (FPL), in order to address the NRC concerns on 10 CFR 50.49, has prepared Attachments I, II and III which provide the necessary information required to respond to the requirements of 10 CFR 50.49. The information in Attachments I, II and III is as follows:

Attachment I) St. Lucie Unit No. 2 10 CFR 50.49 Equipment List

The list contains all electrical equipment important to safety for St. Lucie Unit No. 2 which meets the requirements of Paragraph (d) of the rule. In addition, the SL-2 EQ Report and Guidebook previously submitted to the NRC identifies the equipment's environmental characteristics. Equipment electrical characteristics are detailed in drawings and specifications and are maintained on file.

TMI Equipment

The list includes all Class 1E TMI-related equipment installed in the harsh environment as of March 1, 1983, in accordance with NUREG-0737 requirements. Qualification for remaining TMI equipment will be completed following installation but not later than startup following the first refueling outage.

A048
1/1

Regulatory Guide (RG) 1.97 Category 1 & 2 Equipment

FPL letter, L-83-238, dated April 15, 1983, provided a response to NRC Generic Letter 82-33. Amongst the responses was a status summary of FPL's implementation plans for RG 1.97, Rev. 2. As stated in the response, FPL has reviewed all plant instrumentation and control systems against the requirements and expects to submit a St. Lucie Unit No. 2 evaluation report by November 30, 1983. Qualification status will be addressed as part of the RG 1.97 task. Appropriate revision will be implemented to the 10 CFR 50.49 list at that time. In addition, FPL letter, L-83-238, also submitted a list and description of the RG 1.97 Type A variables applicable to St. Lucie Unit No. 2.

Attachment II) Justification for Interim Operation

Attachment II includes twelve (13) justifications for Interim Operation (JIO) covering equipment on the 10 CFR 50.49 Equipment List with a status of other than "Qualified." In addition to the technical explanation of interim technical adequacy, the JIO package also provides a concise status explaining what information is necessary to complete the qualification and the scheduled completion date.

With regard to Paragraph (b)(2) of 10 CFR 50.49, the Environmental Qualification Program for St. Lucie Unit No. 2 considers the effect of non-safety related equipment whose failure could prevent satisfactory accomplishment of safety functions. A review of potential control system interactions during high energy pipe breaks has been conducted for St. Lucie Unit No. 2. Review is based on the Combustion Engineering (CE) generic effort (FPL letter L-79-287 to H.R. Denton (NRC), October 8, 1979). The review considered both the specific systems listed in IE Information Notice 79-22 and other non-safety systems which could possibly interact with safety grade systems. The results of a review of the generic evaluation applied to the St. Lucie Unit No. 2 design has been reviewed and approved by the NRC and is contained in the St. Lucie Unit No. 2 FSAR (Question 420.3). As a policy, all equipment located in a harsh environment that is connected to Class 1E equipment are qualified for the intended environment. Exceptions are analyzed with respect to all possible failure modes and their effects. In each case, the suitability of isolation devices (fuses, circuit

breakers) is included with the review. As indicated within the SL-2 Report and Guidebook, the harsh environmental parameters (i.e., temperature, pressure, radiation, humidity) for the LOCA case are analyzed, and the following high energy line break/scenarios are also considered:

a) Main Steam (MS) and Feedwater (BF)

b) Chemical and Volume Control System (Charging and Letdown)

c) Steam Generator Blowdown System (SGBS)

d) Auxiliary Steam System (ASS)

e) Auxiliary Feedwater System (AFW)

As noted in FSAR Section 8.3.1.2e, any non-safety related load that is connected to a safety related bus is fed from a circuit breaker or fuse that is qualified as an isolation device.

The design of the Class 1E portion of the Onsite Power System includes fault current interrupting devices (fuses, circuit breakers, etc.), which serves an isolation function. Circuit interrupting devices actuated by fault current are commonly used as isolating devices. Once actuated, these devices isolate the faulted circuit from the unfaulted circuit.

In addition, FPL has committed to modify the St. Lucie Unit No. 2 design such that those non-safety loads connected to the Class 1E buses which are not considered important for operation and plant investment will be shed from the Class 1E buses by a Safety Injection Signal or will be locked out of service during plant operation in accordance with the Technical Specification. This is also in compliance with RG 1.75 requirements. Those non-safety loads which are considered important for operation and plant investment will remain connected to the Class 1E buses; however, they will be provided with two Class 1E fault current interrupting devices in series. This upgrade of the electrical system design will be accomplished prior to startup following the first refueling outage, as stated in the Safety Evaluation Report (NUREG-0843).

Attachment III) FPL letter dated March 18, 1983 (L-83-152), provided the results of analyses in response to the requirements of 10 CFR 50.49, concerning the environmental qualification of electric equipment

important to safety of nuclear power plants. The staff reviewed this submittal and requested additional information.

In accordance with our commitment of March 30, 1983 (see FPL letter L-83-193), we are forwarding the requested information in Attachment III.

FPL is preparing Revision 5 to the Environmental Qualification Report and Guidebook and will be issued in June, 1983.

If you have any questions, please call.

Very truly yours,

Robert E. Uhrig
Vice President
Advanced Systems and Technology

Attachments.

JES/PPC/WWW/rms

cc: J.P. O'Reilly, Region 2
Harold F. Reis, Esquire

ATTACHMENT III

Items 1.0 and 2.0 (attached) are provided to respond to the staff's request for more detailed information regarding the design basis events evaluated in the St. Lucie Unit 2 Environmental Qualification Program. Specifically, the evaluations include Moderate Energy Line Breaks (MELBs) and Fuel Handling Accidents (FHAs). Item 3 provides additional information regarding the safety injection tank level and pressure instrumentation.

Attachment III

1.0 MODERATE ENERGY LINE BREAKS (MELBs)

10CFR50.49, effective February 22, 1983, requires that equipment important to safety per paragraph 50.49(b) remain functional during design basis events (DBEs). DBEs are defined in 40.49(b)(1) as:

- conditions of normal operation, including anticipated operational occurrences
- design basis accidents
- external events, and
- natural phenomena

10CFR50.49 excludes equipment in a mild environment (i.e., "an environment that would at no time be significantly more severe than the environment that would occur during normal plant operation, including anticipated operational occurrences"). Therefore, by inspection, 10CFR50.49 requires qualification to withstand design basis accidents, only.

Note that 10CFR50.49(e) requires "most severe" parameters throughout. As discussed above, 10CFR50.49 addresses DBAs only and it can be argued that 10CFR50.49 excludes moderate energy line breaks (cracks) (MELBs) since these line ruptures are overshadowed, in every parameter of concern, except for submergence, by the postulate of high-energy line breaks (HELBs). That is, HELBs produce worse pressure, temperature, humidity, radiation, etc. effects, than do MELBs.

Systems considered for moderate energy analysis inside containment are identified in FSAR subsection 3.6.1.2.2. Design basis environmental conditions inside containment are established by high energy pipe breaks. Therefore, the effects of moderate energy piping failures inside containment are not evaluated.

Notwithstanding the above, during the July 7-10, 1981 EQ workshop in Bethesda, both industry and NRC recognized and discussed the inclusion of one MELB parameter, flooding (submergence), when discussing qualification of equipment outside containment. The logic in those discussions follows:

1) For equipment inside containment, flooding/submergence concerns are enveloped by consideration in EQ submittals of containment flooding from 600,000 gallons of water. (i.e., NRC screening criterion which is roughly equivalent to the contents of a refueling water storage tank via ECCS injection and RCS volume spill from a LOCA),

2) Equipment outside containment is subject to flooding from various sources:

   a) External events and natural phenomena: protection against such flooding is reviewed by NRC pursuant to SRP criteria in SRPs 2.3, 2.4, 3.2, 3.4, 3.6,

9.2, 9.5.1 and GDCs 2, 3 and 4.

b) High energy pipe breaks: addressed in SRP 3.6 and GDC 4 (although flooding effects are not the primary parameter of concern since HELBs generally require automatic termination to preclude severe overpressures, pipe whips, etc.)

c) Moderate energy line breaks: addressed in SRPs 3.6, 9.2 and 9.5.1 (See St. Lucie 2 FSAR, Appendix 3.6F, for example.)

3) Based on (2), EQ submittals need only reference where flooding effects are evaluated. (See the St. Lucie 2 EQ Report and Guidebook Section 7.6, "Submerged or Potentially Submerged Equipment".)

Based on all the above, 10CFR50.49 (and thus any EQ submittals) need not explicitly address MELBs since: a) DBA parameters, by definition, encompass events of lesser severity and 10CFR50.49 excludes all but DBAs, and b) all safety related equipment inside containment and in the steam tressle area is specified, designed and tested to DBA parameters regardless of its location.

2.0 Fuel Handling Accidents (FHAs)

The only parameter of concern in a fuel handling accident is radiation. But, the radiation concern is primarily personnel (plant worker exposures) and public health (offsite dose exposures) oriented. Strictly speaking, therefore, a fuel handling accident is never a design basis accident since no single structure, system or component uses this accident as the most severe environmental basis which governs design. If 10 CFR 50.49 is interpreted as considering only DBAs, then fuel handling accidents are excluded since they are not DBAs.

On the other hand, the rupture of a fuel assembly is considered the most severe (DBA) type of fuel handling accident from a radiation standpoint; but, (analogous to the discussion of MELBs above) equipment used to mitigate/monitor FHA radiation has already been specified and designed to more severe radiation conditions, namely LOCA. The accident mitigation and monitoring equipment used for FHA are also used for LOCA; i.e., radiation monitors, the Shield Building Ventilation System, Containment Isolation Actuation System and Control Room Air Conditioning System. In other words, the DBA-radiation is the DBA-LOCA not the DBA-FHA. Note that 10 CFR 50.49(e)(4) requires the "most severe" DBA for radiation.

Based on the above, 10 CFR 50.49 (and thus any EQ submittals) need not explicitly address FHAs since:

1) An FHA is not an environmental DBA but, is enveloped by the DBA-LOCA: 10 CFR 50.49 excludes all but the DBA for the parameter of concern and thus does not require considerations of FHAs;

2) The equipment used for FHA is also used for DBA-LOCA and thus "over-specified" for an FHA;

3) FHA effects on plant safety are minimal, being most concerned with health physics, and;

4) Radiation protection is evaluated in various other Sections of the FSAR under the cognizance of other Branches (e.g., SRPs 9.1, 9.2, Chapter 12 and Chapter 15).

3.0 Safety Injection Tank Level and Pressure

The Safety Injection Tank level and pressure instruments are considered to be Type D variables in conformity with Regulatory Guide 1.97, Rev. 2 terminology. Following a design basis LOCA the SITs are passive injectors of borated ECCS water into the RCS, dependent only on RCS pressure falling below 600 psig.

The primary parameters of concern regarding SIT (and ECCS) injection are RCS pressure and indications of adequate core cooling, which are Type B variables, along with indications of fission product barrier integrity, which are Type C variables. The importance of SIT pressure and level indication is insignificant and minimal compared to the Types B/C variables information since in following a DBA-LOCA:

1. Only Types B/C variable information is important regarding successful accomplishment of safety functions;

2. SIT function is automatically accomplished in about 10 seconds following the accident; thus, precluding adverse environmental parameters affecting pressure and level indication in such a short time;

3. Injection is automatic and passive, requiring no operator action;

4. The locked open power-removed SIT isolation valve receives an SIAS to open;

5. If the SITs inject and the pressure and level instruments indicate otherwise, no ameliorating action is required, and;

6. Compliance with technical specification 3.5.1 ensures that the SITs will be maintained in an operable condition (when required), so that the SITs would perform their intended safety function.