REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR:8403010400 DOC.DATE: 84/02/27 NOTARIZED: NO DOCKET #
FACIL:50-389 St. Lucie Plant, Unit 2, Florida Power & Light Co. 05000389
AUTH.NAME AUTHOR AFFILIATION
WILLIAMS,J.W. Florida Power & Light Co.
RECIP.NAME RECIPIENT AFFILIATION
EISENHUT,D.G. Division of Licensing

SUBJECT: Submits info re pressurizer heater transformer barrier design,per License Condition 2.C.9,Missile protection structure will be seismically anchored on concrete floor slab.

DISTRIBUTION CODE: A001S COPIES RECEIVED:LTR 1 ENCL 1 SIZE: 3
TITLE: OR Submittal: General Distribution

NOTES:

	RECIPIENT ID CODE/NAME		COPIES LTTR	COPIES ENCL	RECIPIENT ID CODE/NAME		COPIES LTTR	COPIES ENCL
	NRR ORB3 BC	01	7	7				
INTERNAL:	ELD/HDS2		1	0	NRR/DE/MTEB		1	1
	NRR/DL DIR		1	1	NRR/DL/ORAB		1	0
	NRR/DSI/METB		1	1	NRR/DSI/RAB		1	1
	REG FILE	04	1	1	RGN2		1	1
EXTERNAL:	ACRS	09	6	6	LPDR	03	1	1
	NRC PDR	02	1	1	NSIC	05	1	1
	NTIS		1	1				

TOTAL NUMBER OF COPIES REQUIRED: LTTR 25 ENCL 23

| | | |

DX 14000, JUNO BEACH, FL 33408

FLORIDA POWER & LIGHT COMPANY

February 27, 1984
L-84-44

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

Dear Mr. Eisenhut:

RE: ST. LUCIE PLANT - UNIT NO. 2
DOCKET 50-389
PRESSURIZER HEATER TRANSFORMER BARRIER DESIGN

REF: 1) FPL letter L-82-429 dated October 29, 1982 from R.E. Uhrig (FPL) to D.G. Eisenhut (NRC)
2) NUREG 0843 Supplement 3 dated April 1983

In accordance with the St. Lucie Unit 2 operating license NPF-16, Condition of License 2.C.9, Florida Power & Light Company herewith submits the following information on the pressurizer Heater Transformer Barrier design.

During a 1982 Power Systems Branch site audit, the NRC identified "high energy equipment" (the Pressurizer Heater Transformers) in the cable spread area. Via Reference 1, FPL committed to install a suitable barrier around the transformers prior to startup following the first refueling. Per Reference 2, the NRC stipulated that FPL's commitment is acceptable provided that prior to installation FPL submit the barrier design and justification for NRC review and approval. The following is FPL's design philosophy for this barrier.

The Pressurizer Heater Buses are part of the onsite power distribution system. The buses are comprised of a 480 volt class motor control center with a throat connected transformer. The transformers are 750KVA, 4.16 KV to 480 volts, three phase. Any postulated failure of the Pressurizer Heater Transformers must somehow be initiated from the electrical system. FPL has assumed (non-mechanistically)an electrical failure which would increase the internal pressure of the transformer and cause it to rupture. The transformer is designed to operate below 5 psig with a relief valve set at that pressure; the tank is designed for 6.25 psig by the vendor. By using independent, conservative methods, the tank was determined to fail in different places at 10-16 psig. However, the pressure used in the calculation was conservatively raised to 30 psig, which is a factor of almost five over the vendor information.

In this analysis, all appurtenances, regardless of attachment, were considered as potential missiles. The velocity of a missile is dependent on its mass and cross sectional area, the driving force, and the distance to the barrier. The driving force is the pressure that would cause tank rupture by seam

A001
1/1

splitting. The missile, therefore, is assumed to be driven out by the built-up pressure just prior to a tank failure. With the driving force and mass known for each object, the acceleration was found. The acceleration is used to determine the velocity of the missile. The velocity is required to determine the impactive force of the missile. A broad spectrum of large and small, heavy and light objects are considered as missiles to provide adequate loading combinations.

To contain the missiles from the transformer, a barrier layout was prepared consisting of structural steel grating and a supporting structure. (see Figure 1) The important items considered were the penetration of the missiles through the grating and the impactive force on the grating.

The grating was designed as described in FSAR Section 3.5.3.1.2b.

It was assumed that only one missile at a time will hit the grating. It was determined that a grating thickness of 0.75" would be adequate. The openings in the grating were sized to contain the majority of the missiles. Certain very small missiles, however, were considered that might penetrate the barrier (e.g. a pipe plug). Structural steel plates will be installed on the grating in the front of these very small potential missiles.

Finally, the missile protection structure will be seismically anchored on the concrete floor slab.

FPL concludes that this barrier will preclude damage to the cable spreading area in the highly unlikely event of a tank rupture.

This concludes our reporting requirements to comply with condition of license 2.C.9.

We intend to proceed with this design unless you have additional concerns. Please contact us accordingly.

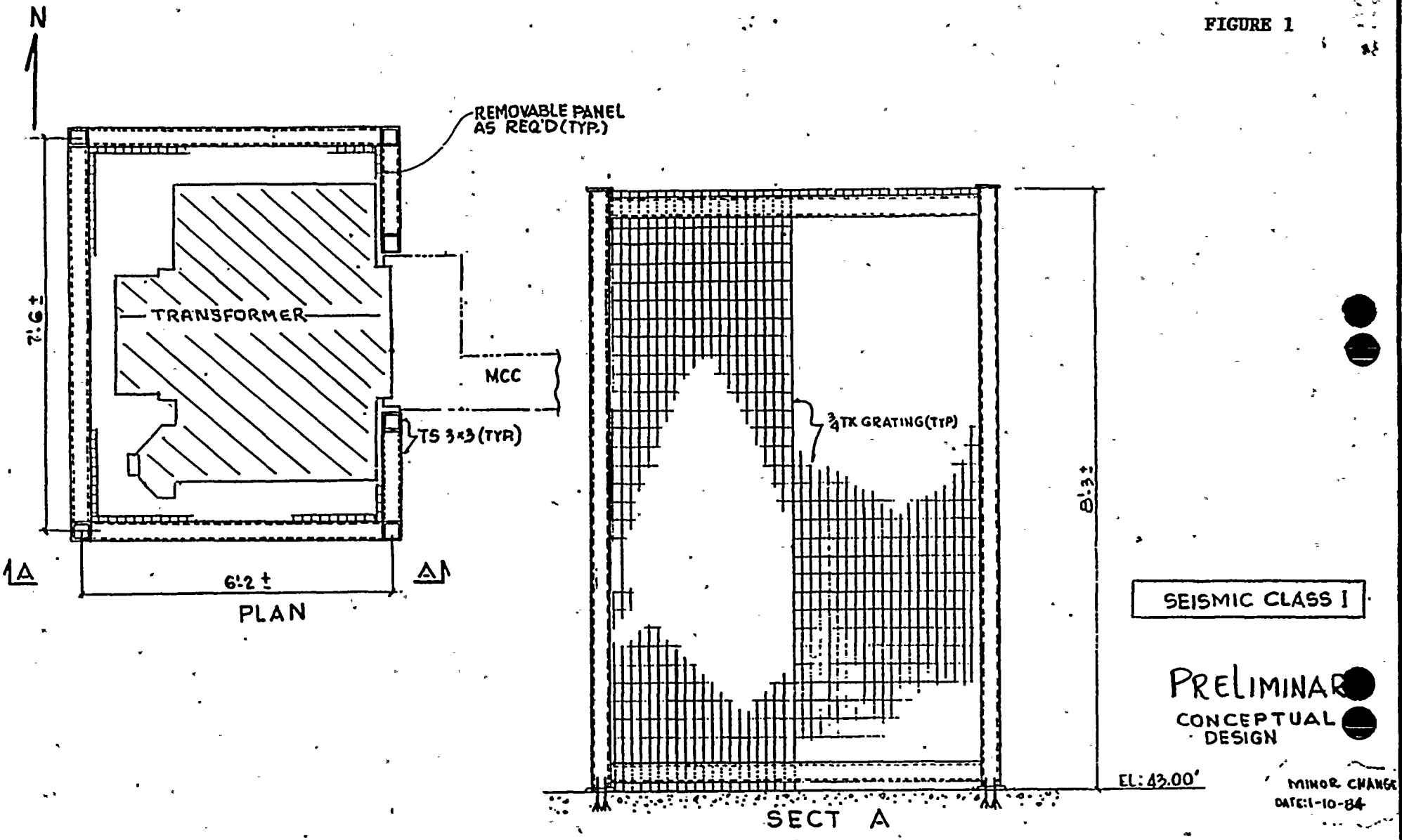
Very truly yours,

J.W. Williams, Jr.
Vice President
Nuclear Energy

Attachment

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

FIGURE 1



EBASCO SERVICES INCORPORATED		FLORIDA POWER & LIGHT COMPANY ST. LUCIE PLANT - UNIT-2 R.A.B - LAYOUT OF MISSILE BARRIER FOR TRANSFORMER
DIV. CIVIL DR. NN	APPROVED	SKETCH NO. 1
DATE 12/5/83 CHECK'D		
SCALE NTS		