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RECIP. NAME RECIPIENT AFFILIATION
ANDESAM, E. G. BWR Project Directorate 3

SUBJECT: Responds to NRC 860508 ltr re util compliance w/Reg 1.75 Plant design conforms to Reg Guide 1.75 guidelines. "Failure Mode & Effect Analysis" Qualified IE components will be provided prior to scheduled outage.

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	IE/DEPER/EPB	36	1	1	IE/DQAVT/QAB	21	1	1
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	NRR/DHFT/HFIB		1	1	NRR/DHFT/MTB		1	1
	REG FILE	04	1	1	RGN1		3	3
	RM/DDAMI/MIB		1	0				
EXTERNAL:	24X		1	1	BNL(AMDTS ONLY)		1	1
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NIAGARA MOHAWK POWER CORPORATION/300 ERIE BOULEVARD WEST, SYRACUSE, N.Y. 13202/TELEPHONE (315) 474-1511

June 2, 1986
(NMP2L 0730)

Ms. Elinor G. Adensam, Director
BWR Project Directorate No. 3
U.S. Nuclear Regulatory Commission
7920 Norfolk Avenue
Washington, DC 20555

Dear Ms. Adensam:

Re: Nine Mile Point Unit 2
Docket No. 50-410

This letter is in response to the Nuclear Regulatory Commission Project Manager's letter dated May 8, 1985 concerning compliance to Regulatory Guide 1.75 as discussed in Niagara Mohawk's report entitled "Failure Mode and Effect Analysis."

General Electric indicates that Nine Mile Point Unit 2 current design meets the same standards for conforming to the separation guidelines of Regulatory Guide 1.75 within the Power Generation Control Complex as all other plants including recent licensed plants.

However, prior to completion of the "mini-outage" currently scheduled for 12 months after power operation, Niagara Mohawk will provide:

1. Redundant Class 1E protection devices for non-1E circuits having 1E power supply in the General Electric Power Generation Control Complex panels

2. Qualified 1E components as identified in the enclosure.

Very truly yours,

C. V. Mangan
Senior Vice President

WB:ja
1646G

Enclosure

xc: R. A. Gramm, NRC Resident Inspector
Project File (2)

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of	)	
Niagara Mohawk Power Corporation	)	Docket No. 50-410
(Nine Mile Point Unit 2)	)	

AFFIDAVIT

C. V. Mangan, being duly sworn, states that he is Senior Vice President of Niagara Mohawk Power Corporation; that he is authorized on the part of said Corporation to sign and file with the Nuclear Regulatory Commission the documents attached hereto; and that all such documents are true and correct to the best of his knowledge, information and belief.

C V Mangan

Subscribed and sworn to before me, a Notary Public in and for the State of New York and County of Onondaga, this 2nd day of June, 1986.

Christine Austin
Notary Public in and for
Onondaga County, New York

My Commission expires:
CHRISTINE AUSTIN
Notary Public in the State of New York
Qualified in Onondaga Co. No. 4787687
My Commission Expires March 30, 1987

CHRISTINE AUSTIN
Notary Public in the State of New York
Qualified in Orange Co. No. 4707627
My Commission Expires March 30, 19[illegible]

ENCLOSURE

The following information addresses the 6 NRC comments:

1. Comment: Identify any Regulatory Guide 1.97, Category I variables (function) that have non-Class 1E components. The staff position is that all Category I variables should be Class 1E.

   Response: Attachment 1 identifies those RG 1.97 Category 1 variables currently identified as containing non-Class 1E components. All RG 1.97 Category 1 variables will be installed as 1E by fuel load.

2. Comment: Justify the use of non-Class 1E components for High Pressure Core Spray (HPCS) bypass valve position indication or provide Class 1E components for this position indication.

   Response: Two Class 1E resistors (E22-R21, R22) will be installed in the HPCS test valve position indication circuit. This will be accomplished prior to startup after the mini-outage.

   The following is the justification for this implementation schedule:

   The high pressure core spray test bypass valves E22-F010 and F011 position indication circuits are powered from a Class 1E supply. The circuit uses 250Ω non-1E resistors E22A-R21, R22 as voltage divider to adjust the range of the electrical signal for valve position indicators E22-R606, R604. The valve position indication function by itself does not initiate or prevent the core spray pump operation and is not essential for mitigating a LOCA event. The position indication provides operator information during system testing. If the indication is unavailable and the bypass valve is inadvertently left open following a system test and the HPCS is required to operate, the valves are automatically closed. Sufficient other indications are available to the operator to assure proper valve line-up and flow into the vessel. Such indications are:

   a. HPCS pump discharge pressure indication, E22-R601, a Class 1E device (PPD 164C5288P239012) at H13-P601.

   b. HPCS flow indication, E22-R603, a Class 1E device (PPD 164C5288P162083) at H13-P601.

   c. HPCS line high point vent level switch E22-N058 (non-1E) which activates an alarm "HPCS HIGH POINT VENT LVL LOW" (alarm point 0819). The level switch is an ultrasonic detector and the alarm function is a non-Class 1E function similar to all other alarm functions.

   Based on the above discussion, it is concluded that the valves will be properly positioned and there are enough alternate means available for operator information, assuming the loss of the bypass valve indication, due to failure of the non-Class 1E resistor. Also, there is no detrimental effect to the system safety function.

ENCLOSURE

2. (cont.)

The power supply circuit for the position indications is fed from Division 3, 125Vdc bus, via 10 amp fuses E22B-F4, F5, non-Class 1E, each in series with a 15 amp, double pole, Class 1E circuit breaker (E22B-CB17). Thus, in the event of a failure of the indication circuit causing a low impedance fault (short across +ve and -ve terminals), the faulted circuit will be isolated by opening of one or more of these protective devices without degrading the Class 1E bus. Thus, there will be no safety impact on the electrical power system. Refer to Figure 1 for simplified circuit representation.

3. Comment: Justify he use of non-Class 1E signal resistor units (SRUs) for the RHR Hx service water flow indication (A&B) or provide Class 1E SRUs for this indication.

Response: Two Class 1E signal resistor units will be installed for the RHR Hx service water flow indication (A&B). This will be accomplished prior to startup after the mini-outage.

The following is the justification for this implementation schedule:

a. These SRUs are identical to nuclear-safety-related SRUs described by PPD#184C5812 (both sets are Bailey type 766 SRUs utilizing the identical components).

b. Each SRU consists of terminal board and wire wound resistors. Potential fault paths are current-limited in the SRUs by series components. The current-limiting components will open on excessive current demand, thus disconnecting the faulty device from Class 1E power. Short circuit of resistors is not a credible failure.

c. The terminal boards are diallyl phthalate and have a dielectric strength of 2,200 volts.

d. The resistors are all fixed wire wound resistors that are epoxy encapsulated with a dielectric strength of 1,000 volts.

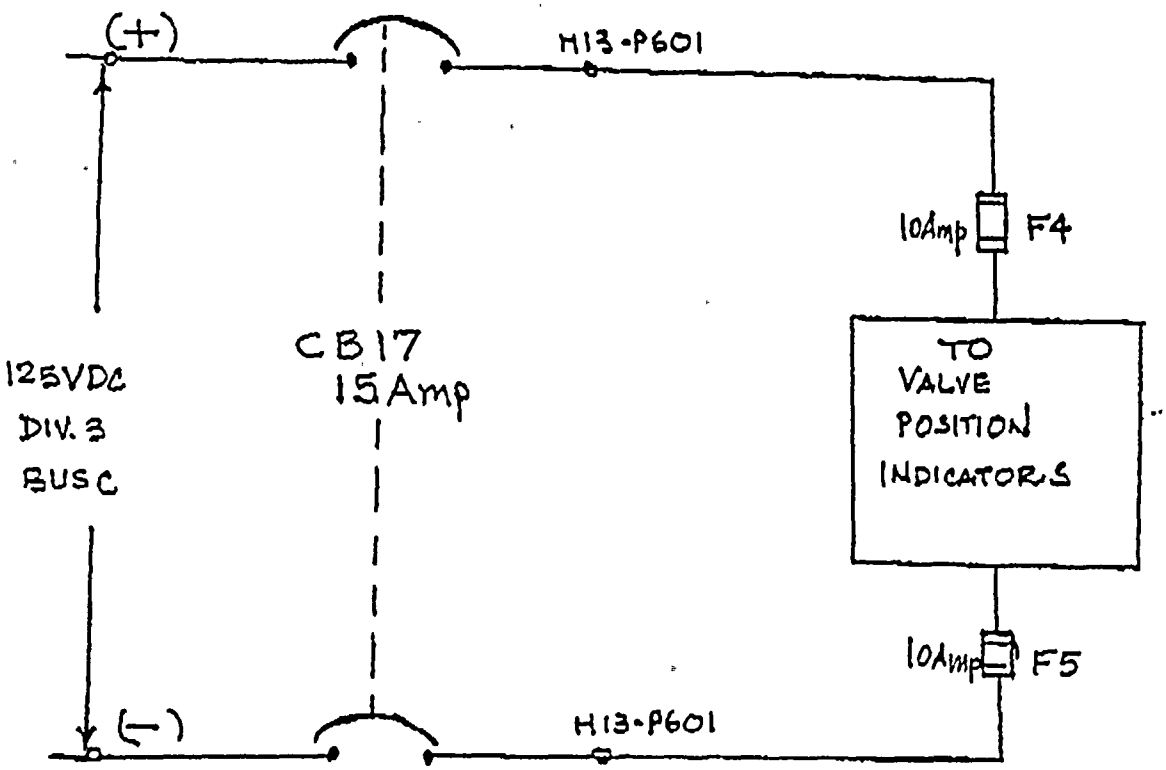

FIGURE 1. HPCS BYPASS VALVE POSITION INDICATION POWER SUPPLY

ENCLOSURE

3. Response (cont.)

e. Mechanical stresses. Identical SRUs were installed on panels that were seismically tested per IEEE 344-1975 to greater than 15g and did not adversely affect the power supply (Reference 6.1).

f. Environmental stresses. SRUs are located in a Class 1E HVAC environment which is less severe than the maximum operating temperature of these units (120°F). The current-limiting resistors in the SRU are functionally rated to 300°F and will be current-limiting at even higher temperatures.

g. This device is identical to the device of the same equipment part number used in the various BWR 4's, 5's and 6's that have been operating over the past fifteen (15) years. GE is not aware of any failure attributable to this device and it's connection to the Class 1E equipment or source.

4. Comment: Justify the use of two non-Class 1E diodes for arc suppression on the RHR Class 1E optical isolators. Discuss the design implications associated with upgrading these diodes to Class 1E. A similar concern exists for the non-Class 1E diodes utilized as arc suppression devices in the end-of-cycle recirculation pump trip systems. Justify the use of these diodes.

Response: Six Class 1E diodes, E12A-CR13, E21A-CR21, C72A-CR3A,B and C72A-CR4A,B will be installed prior to startup after the mini-outage. The following discussion is provided as justification for this implementation schedule.

The diodes in question block reverse current flow unless subjected to a reverse voltage exceeding 400V. (The nominal voltage for the diode applications to 125Vdc, which is far below the breakdown threshold voltage of 400V. There is no high voltage source available to affect this circuit.)

Arc suppression diode E12A-CR13 (E21A-CR21) is provided to protect the isolator card E12A-AT7 (E21A-AT7) output against the transients caused by switching of inductive relay load E12A-K137A (K137B). The output relay function is to provide an automatic stop signal to RHR pump E12-C002A(B). This auto stop signal is activated by an input signal from shutdown cooling suction valve E12-F008 (F009) logic.

For diodes E12A-CR13 and E21A-CR21, the unlikely diode failure which would result in current flow in the reverse direction may cause the output of the isolator card to be shorted. This may prevent operation of the RHR pump in the shutdown cooling mode. This shutdown cooling alignment is considered to be a non-safety function. This system is designed to be initiated and secured by operator action. The relay logic is mechanized so that during the LPCI mode of RHR, the stop signal from these valves will have no impact on the pump circuitry. The same justification holds true for the diode open circuit failure which removes the arc suppression protection for the isolator card.

ENCLOSURE

4. (cont.)

Diodes C72A-CR3A, 4A and 4B are used in the recirculation pump trip coil circuit. Each diode directs the trip signal power to its respective trip coil (52TC1-CB3A, CB3B, CB4A and CB4B).

For diodes C72A-CR3A, 3B, 4A and 4B, if anyone of the two diodes in its given pair (CR3A, 2B = pair 1; CR4A, 4B = pair 2) fails open, activation of it's associated trip coil is prevented. However, each pump has two redundant trip coils, one in each RPT logic. This allows either trip logic to trip both pumps. Loss of this recirculation pump trip function will not prevent the turbine stop valve or control valve initiated RPS scram function. Diode open circuiting will have no effect on the power supply. A short across the diode will allow the trip coil to be energized when demanded and does not prevent a tripping function.

The diodes E12A-CR13, E21A-CR21, C72A-CR2A, 2B, 4A and 4B are JEDEC Catalogue No. 1N4004. The same diodes have been purchased from the same vendor and have already performed satisfactorily in nuclear utility operations for a long time. These same diodes have been used for years as integral components of the qualified isolator assemblies. The quality of these diodes is comparable to Class 1E and will meet the technical requirements of the safety-related assembly in which they are installed. Identical diodes have been tested successfully to demonstrate their seismic adequacy. The results of these tests are contained in GE DRF C22-00017.

Based on the seismic test data and the continued purchase of the same hardware from the same vendor, it is concluded that the diodes supplied will perform this arc suppression function and the necessary safety function will be satisfied. Thus, there is no threat to the Class 1E bus/power supply or system safety functions.

5. Comment: Provide the maximum wattage that would be expanded by each non-Class 1E device listed in the NMP2 January 1986 report.

Response: The following tabulation provides a list of non-Class 1E devices identified in the January 1986 report, with their corresponding maximum wattage rating.

SYSTEM	DEVICE NUMBER	DEVICE MPL. NO.	MAX. DEVICE OR CIRCUIT WATTAGE
RHR	Controller	E12-R604A	24 W (includes resistor E12A-R111)
		E12-R604B	24 W (includes resistor E12A-R112)
		E12-R605	24 W
		E12-R606A	24 W (includes Transducer E12-K003A)

SYSTEM	DEVICE NUMBER	DEVICE MPL. NO.	MAX. DEVICE OR CIRCUIT WATTAGE
		E12-R606B	24 W (includes Transducer E12-K003B)
	Selector Station	E12-K605A	3 W
		E12-K605B	3 W
	Pressure Meter	E12-R605-1	50 mW
		E12-R606A-1	50 mW
		E12-R606B-1	50 mW
	Level Meter	E12-R604A-1	50 mW
		E12-R604B-1	50 mW
	Recorder	B22-R615	12 W
	Manual Unit	E12-Z2A	4.8 W (includes Transducer E12-K001A)
		E12-Z2B	4.8 W (includes Transducer E12-K001B
	Transformer	E12-T01	10 W
	Meter	E12-R608A	150 mW
		E12-R608B	150 mW
		E12-R609A	150 mW
		E12-R609B	150 mW
	Signal Resistor Unit	E12A-SRU1A,B	0.45 W
		SRU2A,B	
		E12A-SRU3A,B	3.2 W
	Diode	E12A-CR1-12	1 W each
	Resistor	E12A-R113-115	75 W each
RCIC	Pressure Meter	E51-R601	50 mW
		E51-R603	50 mW
		E51-R604	50 mW
SLCS	Pressure	C41-R600A	24 W (includes Level Meter C41-R601 and SRU C41A-SRU1)
		C41-R600B	24 W (includes SRU C41A-SRU2)
	Level Meter	B22-R610	50 mW
	Meter Relay Panel	C41-Z01A	7 W
		C41-Z01B	7 W

SYSTEM	DEVICE NUMBER	DEVICE MPL. NO.	MAX. DEVICE OR CIRCUIT WATTAGE
HPCS-PS	Voltmeter	E22-R610	4.3 W
		E22-R611	4.3 W
		E22-R614	4.3 W
		E22-R615	4.3 W
		E22-R618	4.3 W
	Ammeter	E22-R607	4.3 W
		E22-R616	4.3 W
		E22-R619	4.3 W
		E22-R620	4.3 W
		E22-R621	4.3 W
	Watthour Meter	E22-R004	20 W
	Frequency Meter	E22-R612	10 W
	Current Transducer	E22-K001	5 W
	Var Transducer	E22-K002	5 W
		E22-K003	5 W
	Var Meter	E22-R608	10 W
	Watt Meter	E22-R609	10 W
	Synchoroscope	E22-R613	5 W
	Relay	E22B-K34	16.2 W
		E22B-K37	16.2 W
	Switch	E22B-S01,12	0
	Resistor	E22B-R01	6.5W
		-R01A	20 W
		-R02	1 W
		-R03,4	75 W
RECIRC	Capacitor	B35A-C3A,B thru C6A,B	0.10 W each
	Resistor	B35A-R03A,B thru C6A,B	5 W each
ADS	Resistor	B22C-R01 thru R028	5 W each
NS4	Resistor	B22H-R01 thru R04	10 W
HPCS	Resistor	E22A-R21, R22	75 W

ENCLOSURE

6. Comment: Discuss the differences (design, surveillance, and documentation) that distinguish Class 1E fuses from the non-Class 1E fuses. Provide new analyses (credit cannot be taken for non-Class 1E protection devices) for those instances where credit has been taken for non-Class 1E fuses, breakers, and resistance devices to protect Class 1E circuits from worst-case credible failures within the non-Class 1E circuits. If an analysis indicates that a Class 1E bus would be lost by these failures, then provide redundant Class 1E protection devices. Resistance devices cannot be used as isolation or protection devices (R.G. 1.75)

   Response: Prior to fuel load, NMPC will identify on the "Q-List" the following: all non-1E protection devices used for non-1E circuits having 1E power supply in GE PGCC panels.

   As a result, device replacement will be in accordance with the Nine Mile Point NUclear Station Administrative Procedure No. AP-5.0 Procedure for Repair. This will ensure a Quality Assurance Review.

   In addition, redundant IE protection devices will be installed prior to start up after the mini-outage.

(1614E)

ATTACHMENT 1

	Item No.	Parameter Description
1.	2ISC*LT13A (B22-N044A)	Reactor Vessel Level - A (Fuel Zone)
2.	2ISC*LT13B (B22-N044B)	Reactor Vessel Level - B (Fuel Zone)
3.	2ISC*PT6A (B22-N062A)	Reactor Vessel Pressure - A
4.	2ISC*PT6B (B22-N062B)	Reactor Vessel Pressure - B
5.	2RHS*FT63A	Drywell Spray Header Flow - A (No change)*
6.	2RHS*FT63B	Drywell Spray Header Flow - B (No change)*
7.	2ICS*FT101 (E51-N003)	RCIC System Flow
8.	2CSH*FT104 (E22-N005)	HPCS System Flow
9.	2CSL*FT126 (E22-N003)	LPCS System Flow
10.	2RHS*FT14A (E12-N015A)	LPCI Flow
11.	2RHS*FT14 B, C (E12-N015B, C)	LPCI Flow
12.	2SLS*FT113 (C41-N007)	SLCS System Flow
13.	2SLS*LT103 (C41-N001)	LCS Storage Tank Level
14.	2SWP*PT13A (E12-N007A)	Cooling Water Flow to ESF System Component - A
15.	2SWP*PT13B (E12-N007B)	Cooling Water Flow to ESF System Component - B
16.	2ISC*LT9C (B22-N091E)	Reactor Vessel Level - A (Wide Range)
17.	2ISC*LT9A (B22-N091A)	Reactor Vessel Level - A (Wide Range) (No change)*

*Present hardware is Class 1E

1647G

	Item No.	Parameter Description
18.	2ISC*LT9D (B22-N091F)	Reactor Vessel Level - B (Wide Range)
19.	2ISC*LT9B (B22-N091B)	Reactor Vessel Level - B (Wide Range) (No change)*
20.	2RHS*FT16A	Suppression Chamber Spray Header Flow - A (No change)*
21.	2RHS*FT16B	Suppression Chamber Spray Header Flow - B (No change)*

*Present hardware is Class 1E