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BUTLER,W. Licensing Branch 2

SUBJECT: Forwards revised response to FSAR Question 421-26 re reactor protection sys.Encl will be included in FSAR,Amend 20.

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NIAGARA MOHAWK

NIAGARA MOHAWK POWER CORPORATION/300 ERIE BOULEVARD WEST, SYRACUSE, N.Y. 13202/TELEPHONE (315) 474-1511

May 17, 1985
(NMP2L 0410)

Mr. Walter Butler, Chief
Licensing Branch No. 2
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Dear Mr. Butler:

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

Enclosed for your use and information is the Nine Mile Point Unit 2 revised response to Nuclear Regulatory Commission's Final Safety Analysis Report question 421.26. This information has been previously requested by your staff and is submitted to aid your review of the Unit 2 license application for the resolution of these questions.

The enclosed will be included in the Final Safety Analysis Report Amendment 20.

Very truly yours,

C. V. Mangan
Vice President
Nuclear Engineering & Licensing

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

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QUESTION

421.26 (7.2) (7.3) (7.4) (7.5) (7.6) (7.7)

(a) Section 7.3.1.2.2 of the FSAR references Chapter 16 for the minimum number of sensors required to monitor safety-related variables. The final version of Chapter 16 (Technical Specifications) has not yet been submitted. For each monitored variable that provides an input to a safety-related system (i.e., reactor trip, engineered safety features, reactor core isolation cooling, recirc pump trip, control rod block), list the total number of channels provided and the minimum number of channels required to be operable that will be proposed in Chapter 16.

(b) Confirm that the single failure criterion can be satisfied for each case where the minimum number of operable channel requirement that will be proposed is less than the total number of channels provided.

RESPONSE

(a) For each monitored variable that provides input to a safety-related system, the total number of channels and the minimum number of channels are shown in Table 421.26.

(b) NMP2 safety-related systems are designed to conform with the requirements of IEEE Standard 279-1971. Paragraph 4.11 specifically requires that "the system shall be designed to permit any one channel to be maintained, and when required, tested or calibrated during power operation without initiating a protective action at the systems level. During such operation, the active parts of the system shall of themselves continue to meet the single failure criterion."

NINE MILE POINT UNIT 2 FSAR

TABLE 421.26

REACTOR PROTECTION SYSTEM

TRIP FUNCTION	NORMAL CHANNELS	MINIMUM CHANNELS
1. Intermediate Range Monitors:		
a. Neutron Flux - High	4	3
b. Inoperative	4	3
2. Average Power Range Monitor		
a. Neutron Flux - Upscale, Setdown	3	2
b. Flow Biased Simulated Thermal Power - Upscale	3	2
c. Fixed Neutron Flux - Upscale	3	2
d. Inoperative	3	2
3. Reactor Vessel Steam Dome Pressure - High	2	2
4. Reactor Vessel Water Level - Low, Level 3	2	2
5. Main Steam Line Isolation Valve Closure	4	4
6. Main Steam Line Radiation - High	2	2
7. (Primary Containment) Pressure - High	2	2
8. Scram Discharge Volume Water Level - High		
a. Transmitters/Trip Units	2	2
b. Float Switches	2	2
9. Turbine Stop Valve - Closure	4	4
10. Turbine Control Valve Fast Closure, Valve Trip System Oil Pressure - Low	2	2
11. Reactor Mode Switch Shutdown Position	2	2
12. Manual Scram	2	2

ISOLATION ACTUATION INSTRUMENTATION

	TRIP FUNCTION	NORMAL CHANNELS	MINIMUM CHANNELS
1.	PRIMARY CONTAINMENT ISOLATION		
	a. Reactor Vessel Water Level		
	1) Low, Level 3	2	2
	2) Low Low, Level 2	2	2
	b. Drywell Pressure - High	2	2
	c. Main Steam Line		
	1) Reactor Vessel Water Level (Level 1)	2	2
	2) Radiation - High	2	2
	3) Pressure - Low	2	2
	4) Flow - High	2/line	2/line
	d. Main Steam Line Tunnel Temperature - High	2	2
	e. Main Steam Line Tunnel Δ Temperature - High	2	2
	f. Condenser Vacuum - Low	2	2
	g. Drywell and Suppression Chamber Radiation High	2	2
	h. Manual Initiation	2	2
	i. Turb. Bldg. Steam Leads Enclosure	6	4
2.	REACTOR WATER CLEANUP SYSTEM ISOLATION		
	a. Δ Flow - High	1	1
*	b. Δ Flow - Timer	1	1
	c. Heat Exchanger/Pump Area Temperature - High	3	3
	d. Heat Exchanger/Pump Area Ventilation Δ Temp High	3	3
	e. SLCS Initiation	1	1
	f. Reactor Vessel Water Level - Low Low, Level 2	2	2
	g. Manual Initiation (Isolation)	2	1

*Δ flow timer is part of flow circuit. Tech specs incorporate the timer in the list for safety reasons (i.e., to check for drifts).

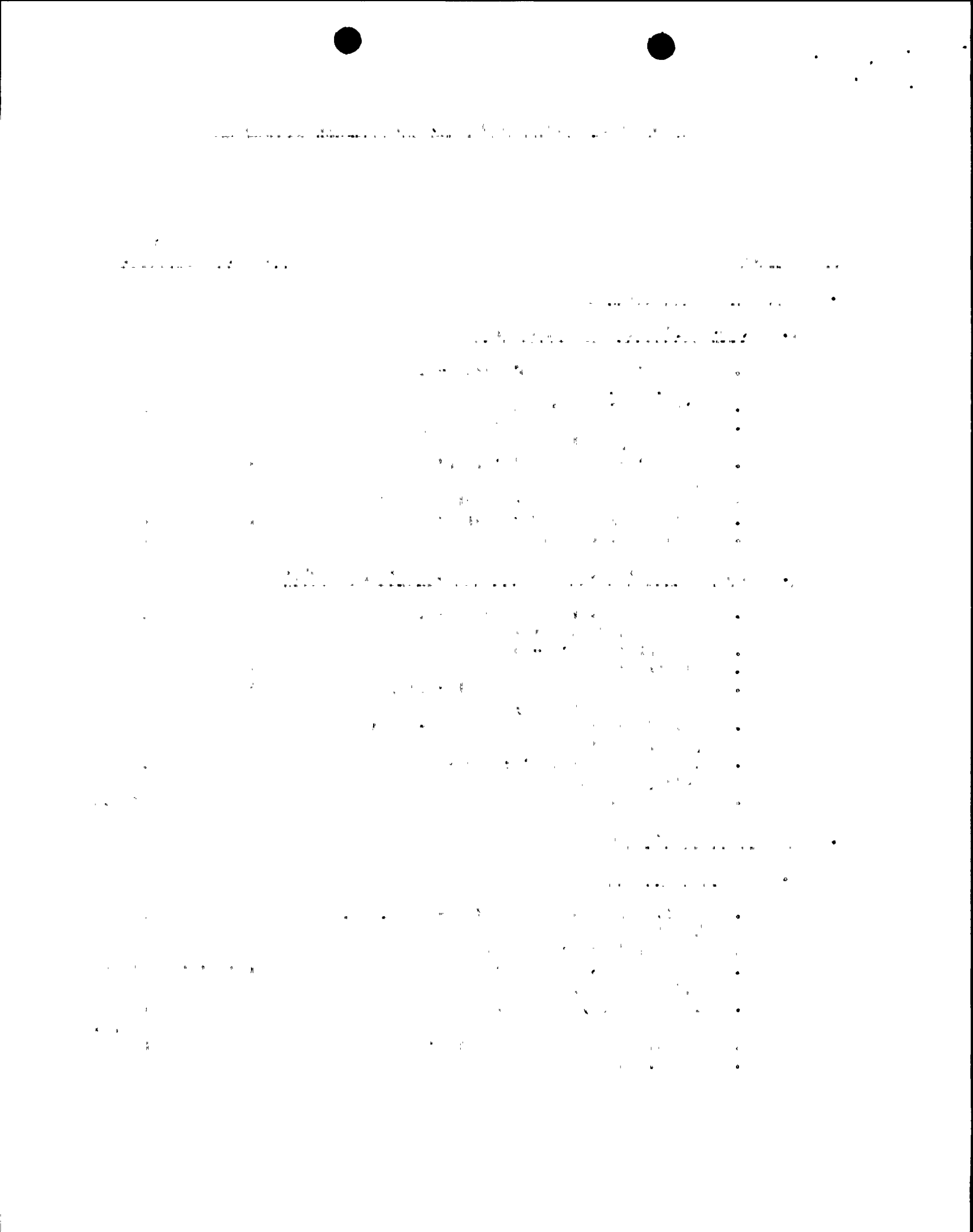
	TRIP FUNCTION	NORMAL CHANNELS	MINIMUM CHANNELS
3.	REACTOR CORE ISOLATION COOLING SYSTEM ISOLATION		
* a.	RCIC Steam Line Flow - High	2	1
b.	RCIC Steam Line Flow -	-	1
c.	RCIC Steam Supply Pressure - Low	2	2
d.	RCIC Turbine Exhaust Diaphragm Pressure - High	2	2
e.	RCIC Equipment Room Temperature - High	1	1
f.	RCIC Equipment Room Δ Temperature - High	1	1
g.	RCIC Steam Line Tunnel Temperature - High	1	1
h.	RCIC Steam Line Tunnel Δ Temperature - High	1	1
i.	RCIC Steam Drywell Pressure - High	2	2
j.	Manual Initiation (Isolation)	2	1
4.	RHR SYSTEM STEAM CONDENSING MODE ISOLATION		
** a.	RHR/RCIC Flow - High	-	1
** b.	Manual Initiation	-	1/valve
5.	RHR SYSTEM SHUTDOWN COOLING MODE ISOLATION		
a.	Reactor Vessel Water Level - Low, Level 3	2	2
b.	Reactor Vessels (RHR Cut-in Permissive) Pressure - High	2	2
c.	RHR Equipment Area Δ Temperature - High	2	2
d.	RHR Equipment Area Temperature - High	2	2
e.	Manual Initiation	2/valve	2/valve

*Δflow timer is part of flow circuit. Tech specs incorporate the timer in the list for safety reasons (i.e., to check for drifts).

** Tech specs retain this trip function because there are two measurements along this line that branch off to RCIC; (1) RHR/RCIC high flow - used to monitor the flow in the common RCIC/RHR steam supply line and, (2) RCIC high flow - used to monitor the flow in the RCIC line.

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION

TRIP FUNCTION	NORMAL CHANNELS	MINIMUM CHANNELS
A. DIVISION 1 TRIP SYSTEM		
1. RHR-A (LPCI MODE) & LPCS SYSTEM		
a. Reactor Vessel Water Level - Low Low Low, Level 1	2	2
b. Drywell Pressure - High	2	2
c. Pressure-Low (LPCS Permissive) Reactor Vessel	1	1
d. Pressure-Low (LPCI Permissive) Reactor Vessel	1	1
e. LPCI Pump A Start Time Delay Relay	1	1
f. Division I Bus Power Monitor	1	1
g. Manual Initiation	1	1
2. AUTOMATIC DEPRESSURIZATION SYSTEM TRIP SYSTEM "A"		
a. Reactor Vessel Water Level - Low Low Low Low, Level 1	2	2
b. Drywell Pressure - High	2	2
c. ADS Timer	1	1
d. Reactor Vessel Water Level - Low, Level 3 (Permissive)	1	1
e. LPCS Pump Discharge Pressure - High (Permissive)	2	2
f. LPCI Pump A Discharge Pressure - High (Permissive)	2	2
g. Manual Initiation	2/system	2/system
B. DIVISION 2 TRIP SYSTEM		
1. RHR B (LPCI MODE)		
a. Reactor Vessel Water Level - Low Low Low, Level 1	2	2
b. Drywell Pressure - High	2	2
c. Reactor Vessel Pressure-Low (LPCI Permissive)	1/valve	1/valve
d. LPCI Pump (B) Start Time Delay Relay	1	1
e. Division II Bus Power Monitor	1	1
f. Manual Initiation	1	1



TRIP FUNCTION	NORMAL CHANNELS	MINIMUM CHANNELS
B. DIVISION 2 TRIP SYSTEM (Continued)		
2. AUTOMATIC DEPRESSURIZATION SYSTEM TRIP SYSTEM "B"		
a. Reactor Vessel Water Level - Low Low Low, Level 1	2	2
b. Drywell Pressure - High	2	2
c. ADS Timer	1	1
d. Reactor Vessel Water Level - Low, Level 3 (Permissive)	1	1
e. LPCI Pump (B and C) Discharge Pressure - High (Permissive)	2/pump	2/pump
f. Manual Initiation	2/system	2/system
C. DIVISION 3 TRIP SYSTEM		
1. HPCS SYSTEM		
a. Reactor Vessel Water Level - (Low, Low, Level 2)	4	4
b. Drywell Pressure - High	4	4
c. Reactor Vessel Water Level - High, Level (8)	4	4
d. Condensate Storage Tank Level - Low	2	2
e. Suppression Pool Water Level - High	2	2
f. Division III Bus Power Monitor	1	1
g. Manual Initiation	1	1
D. LOSS OF POWER (DIV. 3 ONLY)		
1. 4.16 KV Emergency Bus Undervoltage (Loss of Voltage)	3/Bus	2/Bus
2. 4.16 KV Emergency Bus Undervoltage (Degraded Voltage)	3/Bus	2/Bus

ATWS RECIRCULATION PUMP TRIP SYSTEM INSTRUMENTATION

TRIP FUNCTION	NORMAL CHANNELS	MINIMUM CHANNELS
1. Reactor Vessel Water Level - Low Low, Level 2	2	2
2. Reactor Vessel Pressure - High	2	2

END-OF-CYCLE RECIRCULATION PUMP TRIP SYSTEM INSTRUMENTATION

TRIP FUNCTION	NORMAL CHANNELS	MINIMUM CHANNELS
1. Turbine Stop Valve - Closure	2	2
2. Turbine Control Valve-Fast Closure	2	2

REACTOR CORE ISOLATION COOLING SYSTEM ACTUATION INSTRUMENTATION

TRIP FUNCTION	NORMAL CHANNELS	MINIMUM CHANNELS
a. Reactor Vessel Water Level - (Low Low, Level 2)	4	2
b. Reactor Vessel Water Level - High, Level (8)	4	2
c. Condensate Storage Tank Water Level - Low	2	2
d. Manual Initiation	1	1

CONTROL ROD BLOCK INSTRUMENTATION

TRIP FUNCTION	NORMAL CHANNELS	MINIMUM CHANNELS
1. ROD BLOCK MONITOR		
a. Upscale	2	2
b. Inoperative	2	2
c. Downscale	2	2
2. APRM		
a. Flow Biased Neutron Flux Upscale	6	4
b. Inoperative	6	4
c. Downscale	6	4
d. Neutron Flux - Upscale, Startup	6	4
3. SOURCE RANGE MONITORS		
a. Detector not full in	4	3, 2*
b. Upscale	4	3, 2
c. Inoperative	4	3, 2
e. Downscale	4	3, 2
4. INTERMEDIATE RANGE MONITORS		
a. Detector not full in	6	6
b. Upscale	6	6
c. Inoperative	6	6
d. Downscale	6	6
5. SCRAM DISCHARGE VOLUME		
a. Water Level-High	2	2
b. Scram Trip Bypass	2	2
6. REACTOR COOLANT SYSTEM RECIRCULATION FLOW		
a. Upscale	4	2
b. Inoperative	4	2
c. Comparator	4	2

*MOC/TF of 3 is for startup, 2 is for refueling

PLANT SYSTEMS ACTUATION INSTRUMENTATION

TRIP FUNCTION	NORMAL CHANNELS	MINIMUM CHANNELS
1. FEEDWATER SYSTEM/MAIN TURBINE TRIP SYSTEM		
a. Reactor Vessel Water Level - High, Level 8	3	3