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RECIP.NAME RECIPIENT AFFILIATION
IPPOLITO,T. OPERATING REACTORS BRANCH 3

SUBJECT: FORWARDS ADDL INFO REQUESTED AT 790321 MEETING RE PROPOSED TECH SPEC CHANGES IN REACTOR PROTECTION SYS.FIVE OVERSIZED DRAWINGS ENCL.

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FROM: US NRC/TIDC/Distribution Services Branch

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NIAGARA MOHAWK

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

March 27, 1979

Director of Nuclear Reactor Regulation
Attn: Mr. Thomas Ippolito, Chief
Operating Reactors/Branch #3
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Mr. Ippolito:

Re: Nine Mile Point Unit 1
Docket No. 50-220
DPR-63

By affidavit dated February 12, 1979, Niagara Mohawk proposed Technical Specification changes related to operation of the Protective Instrumentation. Certain of these changes related to modifications of equipment in the Reactor Protection System. Niagara Mohawk has determined that the modifications do not involve an unreviewed safety question as defined in Section 50.59 of 10CFR50. This determination has been concurred with by the Site Operations Review Committee. Your staff was also advised of this determination at a March 21, 1979 meeting in your offices.

The Technical Specification changes proposed by Niagara Mohawk will allow for improved operating flexibility. However, they are not necessary for operation of the modified system.

Based on the above, Niagara Mohawk has initiated installation of this equipment and will operate with this new equipment installed after completion of our refueling outage.

Your staff has advised us that additional information is required for them to continue with their review of our Protective Instrumentation Technical Specification submittal. Please find attached responses to questions provided to Niagara Mohawk at the March 21, 1979 meeting.

Very truly yours,

NIAGARA MOHAWK POWER CORPORATION

Gerald K. Rhode, Vice President
System Project Management

A001 S1/1 DENIED TO P POLK

Attachment

7904040077

NIAGARA MOHAWK POWER CORPORATION

NINE MILE POINT UNIT 1

DOCKET NO. 50-220

DPR-63

REACTOR PROTECTION SYSTEM

REQUEST FOR ADDITIONAL INFORMATION

Question 1

Describe the effects the Analog Transmitter/Trip Unit System has on the capability of the instrumentation to monitor plant conditions during and following an accident.

Response

Addition of the Analog Transmitter/Trip Unit System will not affect the ability to monitor plant conditions during and following an accident. The Analog Transmitter/Trip Unit System is a replacement for mechanical sensor switches. The addition of this hardware into RPS and ECCS instrument systems affects the systems at the sensor level and not the logic level. Since the dual channel design (with two trip systems) of the Reactor Protection System is not being altered, the safe and reliable operation of the trip system is not compromised. The automatic and manual initiation and protective action of essential systems remains unchanged.

Question 2

Prior to your application, the staff had reviewed and approved the General Electric Topical Reports NEDO-21617 and NEDO-21617-1, "Analog Transmitter/Trip Unit System." Our present review covers only those site specific design areas related to the Nine Mile Point Unit 1 installation. Therefore, you are requested to provide the "interface" information as delineated in Section 5.4 of NEDO-21617-1 dated January 1978.

5.4.1 Specific Instrument Loops

Supply information for each instrument loop that will be converted to the analog system as identified below:

(1) variable name
(2) part number of device being deleted
(3) system induced
(4) the engineered safeguards division
(5) model number and vendor of the transmitter or RTD

5.4.2 Trip Unit Cabinet

Supply information for each trip unit cabinet as identified below:

(1) Cabinet layout showing location areas of the power supplies, trip relays, and trip units.

(2) Division to which the cabinet is assigned

(3) Layout of each card file in the trip unit cabinet showing the trip variable for each card file slot.

5.4.3 Environmental Interface

The environment at each location where the retrofit hardware will be located must be compared to the maximum environment as stated in the topical report for the following factors:

(1) Normal operation and post-accident temperature and humidity.

(2) Comparison of the floor seismic response spectra of the cabinet mounting location for the specific plant to seismic test envelope that the cabinet was tested to.

5.4.3 Environmental Interface (Continued)

(3) If the trip unit cabinets are not located in the preferred location as per paragraph 5.1.4, provide justification for the alternate selected location.

5.4.4 Specific Plant Interconnections

An interconnection diagram which shows the interconnections between the existing logic cabinets and instrument/cabinets and the new trip unit cabinets is to be provided to the NRC. The content of the information is to be similar to the information shown on Figures 5-3, 5-4 and 5-5 as applicable. The detail of interconnection shown on the retrofit elementary and interconnection block diagram should be sufficient.

5.4.5 Field Calibration Rack

The design and operational information on the "Field Calibration Rack" is to be supplied to the NRC if such a device is purchased and used for transmitter calibration.

Response

Table 1 addresses the information on specific instrument loops requested in 5.4.1 of NEDO-21617-A.

In Table 1 the model number and vendor of the device being replaced is being indicated. The new transmitters replacing the existing mechanical switches are Rosemount Model #1151DP for differential pressure indication and Rosemount Model #1151GP for pressure indication. Differential pressure transmitters are used for level and flow indication and pressure transmitters are used for all other pressure indication.

The RPS System designation in Table 1 refers to parameters which perform a scram function. The Engineered Safeguard designation refers to other protective functions as indicated in the tables in Section 3.6.2 of the Nine Mile Point Unit 1 Technical Specifications.

Response to Question 2 (Continued)

As can be seen in Table 1, instrument numbers RE17 which opens the core spray valves on low reactor pressure and RE23 which closes the main steamline valves on low reactor pressure are not being replaced one for one. These two functions will be slave units to instrument numbers RE03 and RE15, respectively. These two instruments will have a dual function with one transmitter providing input into two trip units. Since the Reactor Protection System is designed to accommodate any single failure and still perform its intended function, the failure of one of the dual function instrument channels will not prevent the two functions from being performed.

The attached Niagara Mohawk Power Corporation drawing (C-27063-C, Revision 0) shows cabinet layout including power supplies, trip relays and trip units.

The attached Niagara Mohawk Power Corporation drawing number (C-22385-C, Sheets 16, 17, 18 and 19) shows the division to which the cabinet is assigned.

The attached Niagara Mohawk Power Corporation drawing number (C-22385-C, Sheets 16, 17, 18 and 19) shows the layout of each card file in the trip unit cabinet including the trip variable for each file slot.

A comparison of normal, abnormal and accident environmental conditions with the environmental qualifications is contained in Table 2 attached.

The seismic qualifications and requirements of the cabinets are included in Table 3.

The maximum floor acceleration is the acceleration magnified at the cabinet floor elevation based on the site maximum credible earthquake of 0.11g (from Section III, Volume I of the Nine Mile Point Unit 1 Final Safety Analysis Report) and using the cabinet natural frequency indicated in Table 3 which gives the largest magnification.

The existing racks have been modified to accommodate the new transmitters and the rack supports have been modified to meet site seismic requirements.

The preferred locations (Control Room or Auxiliary Control Room) were not chosen due to the limited space available in these locations. This is acceptable, since the power supplies and trip relays have been requalified for the higher stress requirements of the Reactor Building (see Table 2).

Specific plant interconnections are shown on the attached Niagara Mohawk Power Corporation drawing number RME-1.

New instrument cable is required for interconnection from new primary transmitters to the trip units. The instrument cable will be twisted and shielded #16 American Wire Gauge with cross-linked polyethylene insulation.

Power cable will also be installed for the power supplies for the new units. The power cable will be 2-conductor #12 American Wire Gauge with cross-linked polyethylene insulation. The new instrument and power cable is qualified to IEEE 383-1974.

The physical independence, separation and isolation of the systems have not been changed.

Niagara Mohawk Power Corporation did not purchase a "Field Calibration Rack" for transmitter calibration.

Question 3

In accordance with Regulatory Guide 1.29, systems or portions of systems that are required for (1) Monitoring of systems important to safety, and (2) Activating systems important to safety shall be designed to withstand the effects of the SSE and remain functional.

In accordance with Standard Review Plan (SRP) 3.11 (Rev. 1) your analysis shall be sufficient to support the conclusion that all safety-related items are capable of performing their design functions under all normal, abnormal and accident environmental conditions. Therefore, as specified in SRP 3.11 provide the following information for each component necessary to assess plant conditions during and following an accident: (1) Equipment Identification, (2) Equipment Location, (3) Normal, Abnormal and Accident Environmental Conditions, (4) Time Required to Operate, and (5) Environmental Qualification.

Response

The information requested above is provided in Table 2 except for the time required to operate. All of the instrumentation (transmitters, trip units, power supplies and trip relays) must operate during and following an accident. The Main Steam Flow-High, Drywell Pressure-High and Emergency Condenser Flow-High will perform their required function within a short time (on the order of a few seconds) of the initiation of the accident. The water level and reactor pressure indication must operate for an indefinite period following an accident.

As indicated in Table 3, each instrument loop consists of a master transmitter trip unit and associated power supply and trip relay except for the three variables indicated in Table 1 which are slave units to other variables.

TABLE 1
Instrument Loops Converted to Analog Sensor System

Variable	Instrument Numbers	System	Engineered Safeguards Division**	Model No. and Vendor of Deleted Device	Number of Devices Master	Number of Devices Slave
Main Steam Flow - High	RE22A-H	RPS/Engineered Safeguard	11A and C 12B and D	Barton Model #278	8	-
Drywell Pressure - High	RE04A-D	RPS/Engineered Safeguard	11A and C 12B and C	Barton Model #284	4	-
Reactor Vessel Level - High Reactor Vessel Level - Low	RE05A-D	RPS/Engineered Safeguard	11A and C 12B and D	Yarway Model #'s 4316E, 4316F, 4316C	4	4
Reactor Vessel Level - Low Low	RE02A-D	Engineered Safeguard	11A and C 12B and D	Yarway Model #4216	4	-
Reactor Vessel Level - Low Low Low	RE18A-D	Engineered Safeguard	11A and C 12B and D	Barton Model #288	4	-
Reactor Vessel Pressure - High Reactor Vessel Pressure - Low	RE03A-D RE23A-D*	RPS/Engineered Safeguard	11A and C 12B and D	Foxboro Model #'s M43E and 43E	4	4
Reactor Vessel Pressure - High (Emergency Condenser Initiation) and Reactor Vessel Pressure Low (Opens Core Spray Discharge Valves)	RE15A-D RE17A-D*	Engineered Safeguard	11A and C 12B and D	Foxboro Model # 43E	4	4
Emergency Condenser Flow High	IB05A-D	Engineered Safeguard	11A and C 12B and D	Barton Model #278	4	-

* Instrument nos. RE17 and RE23 are not being replaced one for one. These two functions will be slave units to instrument nos. RE03 and RE15, respectively.

** Synonymous with channel. Nine Mile Point has two channels in each of two trip systems.

TABLE 2

Equipment	Equipment Location	Environmental Conditions	Nor	Abnor	Accident	Environmental Qualification	Time Required to Operate
36 Master Transmitters	Reactor Building Outside the Drywell	TEMPERATURE	70°	110°	150°	212°F	**
		PRESSURE	-.25"WC	Atmos	0.28 psig	60 psi	
		REL. HUM.	20-80%	100%	100%	Steam	
		RADIATION	5-15mr/hr	15-50mr/hr	$1x10^4$R	1.7×10^5R	
		CHEMICALS	N/A	N/A	N/A	N/A	
		VIBRATION	N/A	N/A	N/A	N/A	
36 Master Trip Units	Reactor Building Outside the Drywell	TEMPERATURE	80°	110°	150°	156°F	**
		PRESSURE	-.25"WC	Atmos	0.28 psig	60 psi	
		REL. HUM.	20-80%	100%	100%	99%	
		RADIATION	1-5 mr/hr	5-25mr/hr	$1x10^4$R	1.7×10^5R	
		CHEMICALS	N/A	N/A	N/A	N/A	
		VIBRATION	N/A	N/A	N/A	N/A	
12 Slave Trip Units	Reactor Building Outside the Drywell	TEMPERATURE	80°	110°	150°	156°F	**
		PRESSURE	-.25"WC	Atmos	0.28 psig	60 psi	
		REL. HUM.	20-80%	100%	100%	99%	
		RADIATION	1-5 mr/hr	5-25mr/hr	$1x10^4$R	$1.7x10^5$R	
		CHEMICALS	N/A	N/A	N/A	N/A	
		VIBRATION	N/A	N/A	N/A	N/A	
8 Power Supplies	Reactor Building Outside the Drywell	TEMPERATURE	80°	110°	150°	156°F	**
		PRESSURE	-.25"WC	Atmos	0.28 psig	60 psi	
		REL. HUM.	20-80%	100%	100%	100%	
		RADIATION	1-5 mr/hr	5-25mr/hr	$1x10^4$R	1.7×10^5R	
		CHEMICALS	N/A	N/A	N/A	N/A	
		VIBRATION	N/A	N/A	N/A	N/A	
8 Trip Relays	Reactor Building Outside the Drywell	TEMPERATURE	80°	110°	150°	156°F	**
		PRESSURE	-.25"WC	Atmos	0.28 psig	60 psi	
		REL. HUM.	20-80%	100%	100%	100%	
		RADIATION	1-5 mr/hr	5-25mr/hr	$1x10^4$R	1.7×10^5R	
		CHEMICALS	N/A	N/A	N/A	N/A	
		VIBRATION	N/A	N/A	N/A	N/A	

** All of the instrumentation is required to operate during and following an accident.

TABLE 3

Cabinet Seismic Qualification

Natural Frequency/ Direction	Maximum Floor Acceleration at Cabinet Floor Elevation	Cabinet Design Acceleration
33 Hz/Vertically	.15g	1.75g
25 Hz/Front to Back	.22g	2.00g
10 Hz/Side to Side	.22g	4.00g