

December 28, 1993
NMP2L 1459

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Re: Nine Mile Point Unit 2
Docket No. 50-410
NPF-69

Gentlemen:

SUBJECT: Setpoint Methodology

The Nuclear Regulatory Commission Staff issued Supplement 2 to the Safety Evaluation Report for Nine Mile Point Nuclear Station Unit 2 in November 1985. In Section 7.2.2.3 of Supplement 2, "Instrument Setpoints," the Staff approved the interim use of the Nine Mile Point Unit 2 setpoint methodology, pending Staff resolution of the information presented by the Instrument Setpoint Methodology Group. On behalf of the Instrument Setpoint Methodology Group, General Electric Company (GE) submitted GE Topical Report NEDC-31336, "General Electric Instrument Setpoint Methodology," dated October 1986 to the Staff for review. NEDC-31336 is a detailed technical report which documents the basis and the methodology for establishing protection system trip setpoints and allowable values.

By letter dated October 6, 1989, Niagara Mohawk committed to provide the Staff a plant specific technical assessment of the setpoint methods used within six months of the Staff's approval of NEDC-31336. The assessment would include the values assigned to each component of the combined channel error allowance, the basis for these values, and the methods used to sum the individual errors. On June 28, 1993, Niagara Mohawk received notification that the Staff had completed its review and issued its safety evaluation of NEDC-31336. The safety evaluation indicated that the general methods used by General Electric in selecting instrument setpoints were acceptable. However, as a result of the Staff's review, several issues were raised. General Electric's letter to the Staff dated September 8, 1993, provided GE's response to these issues.

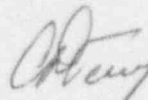
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The purpose of this letter is to provide to the Staff the results of Nine Mile Point Unit 2's plant specific technical assessment for instruments assumed to operate in Updated Safety Analysis Report Chapters 6 and 15 and for which the Instrument Setpoint Methodology Group calculations have been developed. The values assigned to each component of the combined channel error allowance and additional supporting information are contained in the relevant setpoint calculations and are available for your review. The assessment is based on GE NEDC-31336 and the clarifications provided in GE's letter dated September 8, 1993. The results of the assessment are summarized in the attached table. As indicated on the attached table, the existing Nine Mile Point Unit 2 protection system setpoints are conservative or equal when compared to the setpoints calculated using the methods delineated in NEDC-31336 and as clarified in GE's September 8, 1993 letter. Therefore, the existing Technical Specification setpoints ensure that the reactor core and reactor coolant system are prevented from exceeding the licensing safety limits for the transients and accidents analyzed. Accordingly, no Technical Specification changes are required.

Very truly yours,



C. D. Terry
Vice President
Nuclear Engineering

CDT/JMT/ksj

Attachment

004586GG

pc: Mr. T. T. Martin, Regional Administrator, Region I
Mr. R. A. Capra, Director, Project Directorate, I-1, NRR
Mr. J. E. Menning, Project Manager, NRR
Mr. B. S. Norris, Senior Resident Inspector
Records Management

TRIP FUNCTION	CALCULATED				CURRENT			VALIDATED
	SETPOINT TECH SPEC SECTION	ANALYTIC LIMIT AL	ALLOWABLE VALUE AV	NOMINAL SETPOINT NTSP	ANALYTIC LIMIT AL	ALLOWABLE VALUE AV	NOMINAL SETPOINT NTSP	
REACTOR PROTECTION SYSTEM								
Reactor Vessel Steam Dome Pressure High	T2.2.1-1.3	1071psig	≤1061psig	≤1054psig	1071 psig	≤1057psig	≤1037psig	YES
Reactor Vessel Water Level Low (L3)RPS, RHR ADS	T2.2.1-1.3 T3.3.2-2.1.a.3 T3.3.3-2.A.2.c T3.3.3-2.B.2.c	154.3	≥156.1	≥157.0	154.3	≥157.8 in	≥159.3 in	YES
Reactor Vessel Water Level High(L8) HPCS RCIC	T3.3.3-2.C.1.c T3.3.5-2.2	222.3	≤211.5 in	≤208.9 in	222.3 in	≤209.3 in	≤202.3 in	YES
FW/TB	T3.3.9-2.1.a	207.7	≤203.8 in	≤203.1 in	207.0 in	≤203.8 in	≤202.3 in	YES
MSIV closure	T2.2.1-1.5	85% open	≥87% open	≥88% open	85% open	≥88% open	≥92% open	YES
Turbine Stop Valve Closure (also RPT)	T2.2.1-1.9 T3.3.4.2-2	90% open	≥91%open	≥92%open	90% open	≥93% open	≥95% open	YES
Turbine Control Valve Fast Closure (also RPT)	T2.2.1-1.10 T3.3.4.2-2.2	400psig	≥410psig	≥418psig	400psig	≥465psig	≥530psig	YES
Turbine First Stage Pressure (Scram Bypass)	T3.3.1-1.9 T3.3.1-1.10 T3.3.4.2-1	20% 140 psig	≤18.9% ≤132.4 psig	≤.8.1% ≤126.3psig	20% 140psig	≤18.5% ≤129.6psig (1)	≤17% ≤119psig (1)	YES
Flow Biased Simulated Thermal Power Upscale 1) Flow Biased 2) High Flow Clamped	T2.2.1-1.2.b	0.58W+65% 118.0%	≤0.58W+62% ≤115.7%	≤0.58W+61% ≤114.5%	(2) (2)	(3) (3)	(4) (4)	YES YES
APRM Fixed Flux Upscale	T2.2.1-1.2.c	123%	≤120%	≤119%	(2)	≤120%	≤118%	YES

TRIP FUNCTION	CALCULATED				CURRENT			
	SETPOINT TECH SPEC SECTION	ANALYTIC LIMIT AL	ALLOWABLE VALUE AV	NOMINAL SETPOINT NTSP	ANALYTIC LIMIT AL	ALLOWABLE VALUE AV	NOMINAL SETPOINT NTSP	VALIDATED
ISOLATION								
Main Steam Line Low Pressure	T3.3.2-2.1.C.2	720 psig	≥ 729 psig	≥ 736 psig	720 psig	≥ 746psig	≥ 766psig	YES
Main Steam Line High Flow	T3.3.2-2.1.C.3	112.9psid	≤ 109.5psid	≤ 108.2psid	111.5psid	≤ 109.5 psid	≤ 103psid	YES
Condenser Low Vacuum	T3.3.2-2.1.e	7.0in Hg vac	≥ 7.3in Hg vac	≥ 7.4in Hg vac	7.0in Hg vac	≥ 7.6in Hg vac	≥ 8.5in Hg vac	YES
ECCS								
Reactor Vessel Water Level Low (L2) (also isolation) RCIC HPCS NS4 RRCS	T3.3.5-2.1 T3.3.2-2.1.a.2 T3.3.3-2.C.1.a T3.3.4.1-2.1	88.8 in	≥ 95.9 in	≥ 98.5 in	88.8 in	≥ 101.8 in	≥ 108.8 in	YES
Reactor Vessel Water Level Low (L1) (also isolation) ADS,RHR,LPCS NS4	T3.3.2-2.1.a.1 T3.3.3-2.A.1.a T3.3.3-2.A.2.a T3.3.3-2.B.1.a T3.3.3-2.B.2.a	-2.2 in	≥ 4.9 in	≥ 7.5 in	-2.2 in	≥ 10.8 in	≥ 17.8 in	YES
Drywell High Pressure	T2.2.1-1.7 T3.3.2-2.1.b T3.3.2-2.2.h T3.3.3-2.A.1.b T3.3.3-2.B.1.b T3.3.3-2.C.1.b	2.0 psig	≤ 1.92 psig	≤ 1.88 psig	2.0 psig	≤ 1.88 psig	≤ 1.68 psig	YES
LPCI Injection Valve Differential Low Pressure Permissive	T3.3.3-2.A.1.e	173 psid	≤ 160 psid	≤ 152 psid	173 psid	≤ 150 psid(dec)	≤ 130 psid (dec)	YES
LPCS Injection Valve Differential Low Pressure Permissive	T3.3.3-2.A.1.d	111.4 psid	≤ 101 psid	≤ 93 psid	111.4 psid	≤ 98 psid (dec)	≤ 88 psid (dec)	YES

TRIP FUNCTION	CALCULATED				CURRENT			VALIDATED
	SETPOINT TECH SPEC SECTION	ANALYTIC LIMIT AL	ALLOWABLE VALUE AV	NOMINAL SETPOINT NTSP	ANALYTIC LIMIT AL	ALLOWABLE VALUE AV	NOMINAL SETPOINT NTSP	
LPCI Pump Discharge High Pressure Permissive	T3.3.3-2.A.2.e	100 psig	≥103 psig	≥106 psig	100 psig	≥115 psig (inc)	≥125 psig (inc)	YES
LPCS Pump Discharge High Pressure Permissive	T.3.3.3-2.A.2.d	110 psig	≥114 psig	≥117 psig	110 psig	≥125 psig (inc)	≥145 psig (inc)	YES
Condensate Storage Tank Low Level HPCS	T3.3.3-2.C.1.d	0.0 (7)	≥0.8 in	≥1.5 in	X in	≥ X + 2.5 in ≥94.5 in (7)	≥ X + 5 in ≥97 in (7)	YES
Condensate Storage Tank Low Level RCIC	T3.3.5-2.3	0.0 (7)	≥0.4 in	≥0.7 in	Y-0.6 in	≥Y in ≥101 in (7)	≥Y+3 in ≥102 in (7)	YES
Automatic Depressurization System Timer	T3.3.3-2.A.2.b	120SEC	≤117 SEC	≤115 SEC	120 SEC	≤117 SEC	≤105 SEC	YES
OTHER								
Rod Block Monitor (BWR4/5)	None	≤0.66W + 50%	≤0.66W + 47%	≤0.66W + 45%	(2)	(5)	(6)	YES
Reactor Vessel Steam Dome High Pressure (ATWS)	T3.3.4.1-2.2	1080psig	≤1076 psig	≤1069 psig	1080 psig	≤1065 psig	≤1050 psig	YES
Safety Relief Valve Relief Pressure	None	1106,1116,1126 1136,1146 psig	≤1098,1108,1118 1128,1138 psig	≤1088,1098, 1108,1118,1128 psig	(2)	(2)	≤1076,1086, 1096,1106,1116 psig (8)	YES

- (1) Calculation results are in "percent of span" for 0-700.5 psig range transmitters. Technical Specification requirements are in corresponding psig values. 100% corresponds to turbine valves wide open steam flow.
- (2) This value is not available.
- (3) $\leq 0.58 (W-\Delta W) + 62\%$ with a maximum of $\leq 115.5\%$ of Rated Thermal Power.
W = percent of rated recirculation drive flow which produces rated Core flow. $\Delta W=0$ for two loop operation. $\Delta W=5\%$ for single loop operation. Calculation results for instrumentation uncertainties are valid for $\Delta W=5\%$. (Typical for notes (3)-(6)).
- (4) $\leq 0.58(W-\Delta W) + 59\%$ with a maximum of $\leq 113.5\%$ of Rated Thermal Power.
- (5) $\leq 0.66 (W-\Delta W) + 47\%$ with a maximum of 113% (see Core Operating Limits Report).
- (6) $\leq 0.66 (W-\Delta W) + 44\%$ with a maximum of 110% (see Core Operating Limits Report).
- (7) Current and calculated allowances for instrument uncertainties are with respect to a reference level, provided by the plant A/E. The reference level corresponds to the minimum condensate storage tank level required for pump operation. The Technical Specification allowable values and setpoints include the reference level.
- (8) Values from General Electric Design Spec Data Sheets. These setpoints are not in Technical Specifications.

NEDC-31336 GE SETPOINT METHODOLOGY RESULTS FOR NMP2
DISCUSSION

Calculations for the instrument setpoints described in the NRC approved Licensing Topical Report (LTR) "General Electric Instrument Setpoints", NEDC 31336, October 1986 have been performed for Nine Mile Point 2. The results are summarized in this table. The calculations were performed by GE using the methodologies described in the LTR and incorporating plant unique features such as instruments and environments. The following describes the details of the tables.

Trip Function - The instruments listed are based on the items contained in the LTR modified to the Nine Mile Point 2 design. Thus, the High Containment Pressure is not contained in the list since it is a BWR/6 design feature and is not included in BWR/5s. In addition, the SRV Safety function is not described since the NRC in the SER dated February, 1993 removed the mechanical function from the scope of the I&C review. Credit for the relief function of the SRV's is not assumed in the NMP2 safety analysis. Therefore, there are no associated Technical Specifications for these functions.

- (1) Calculated AL - values used in the setpoint calculations
- (2) Calculated AV - The values listed are based on the instrument setpoint methodology and account for the appropriate error terms in the calculation as described in the LTR (i.e. accuracy, calibration, process measurement accuracy, primary element accuracy and any applicable bias). The values are 95% probability single sided.
- (3) Calculated NTSP - The values listed are based on the instrument setpoint methodology and account for the appropriate error terms in the calculation as described in the LTR (i.e. accuracy, calibration, process measurement accuracy, primary element accuracy, drift and any applicable bias). The values are 95% probability single sided and are adjusted, if necessary, to ensure 90% licensing event report avoidance and 95% spurious trip avoidance.
- (4) Current AL - values obtained from GE Design Spec Data Sheets.
- (5) Current AV - The values listed are contained in the current Nine Mile Point 2 Technical Specification Allowable Values (AV).
- (6) Current NTSP - The values listed are contained in the current Nine Mile Point 2 Technical Specification Nominal Trip Setpoints (NTSP).
- (7) Validated - a "yes" confirms that the current Technical Specification Allowable Value and Nominal Setpoint are validated by the calculation and no Technical Specification change is required.