<u>ATTACHMENT A</u>

Niagara Mohawk Power Corporation
License No. DPR-63
Docket No. 50-220

<u>Proposed Changes to Technical Specifications and Bases</u>

Replace existing pages 10, 11, 18, 19, 20, 21, 22, 74, 199, 200, 202, 203, 206, 213, 226, 227, 230, 233, and 251 with the attached revised pages. These pages have been retyped in their entirety with marginal markings to indicate the changes. Page 70a has been added.

SAFETY LIMIT	LIMITING SAFETY SYSTEM SETTING

c. The neutron flux shall not exceed its scram setting for longer than 1.5 seconds as indicated by the process computer. When the process computer is out of service, a safety limit violation shall be assumed if the neutron flux exceeds the scram setting and control rod scram does not occur.

To ensure that the Safety Limit established in Specifications 2.1.1a and 2.1.1b is not exceeded, each required scram shall be initiated by its expected scram signal. The Safety Limit shall be assumed to be exceeded when scram is accomplished by a means other than the expected scram signal.

d. Whenever the reactor is in the shutdown condition with irradiated fuel in the reactor vessel, the water level shall not be more than 6 feet, 3 inches (-10 inches indicator scale) below minimum normal water level (Elevation 302'9") except as specified in "e" below.

e. For the purpose of performing major maintenance (not to exceed 12 weeks in duration) on the reactor vessel; the reactor water level may be lowered 9' below the minimum normal water level (Elevation 302'9"). Whenever the reactor water level is to be lowered below the low-low-low level setpoint redundant instrumentation will be provided to monitor the reactor water level.

T = FRTP/CMFLPD (T is applied only if less than or equal to 1.0)

FRTP = Fraction of Rated Thermal Power where Rated Thermal Power equals 1850 MW

CMFLPD = Core Maximum Fraction of Limiting Power Density

With CMFLPD greater than the FRTP for a short period of time, rather than adjusting the APRM setpoints, the APRM gain may be adjusted so that APRM readings are greater than or equal to 100% times CMFLPD provided that the adjusted APRM reading does not exceed 100% of rated thermal power and a notice of adjustment is posted on the reactor control panel.

b. The IRM scram trip setting shall not exceed 12% of rated neutron flux for IRM range 9 or lower.

The IRM scram trip setting shall not exceed 38.4% of rated neutron flux for IRM range 10.

c. The reactor high pressure scram trip setting shall be ≤ 1080 psig.

d. The reactor water low level scram trip setting shall be no lower than -12 inches (53 inches indicator scale) relative to the minimum normal water level (302'9").

SAFETY LIMIT	LIMITING SAFETY SYSTEM SETTING
Written procedures will be developed and followed whenever the reactor water level is lowered below the low-low level set point (5 feet below minimum normal water level). The procedures will define the valves that will be used to lower the vessel water level. All other valves that have the potential of lowering the vessel water level will be identified by valve number in the procedures and these valves will be red tagged to preclude their operation during the major maintenance with the water level below the low-low level set point. In addition to the Facility Staff requirements given in Specification 6.2.2.b, there shall be another control room operator present in the control room with no other duties than to monitor the reactor vessel water level.	e. The reactor water low-low level setting for core spray initiation shall be no less than -5 feet (5 inches indicator scale) relative to the minimum normal water level (Elevation 302'9"). f. The reactor low pressure setting for main-steam-line isolation valve closure shall be ≥850 psig when the reactor mode switch is in the run position or the IRMs are on range 10. g. The main-steam-line isolation valve closure scram setting shall be ≤10 percent of valve closure (stem position) from full open. h. The generator load rejection scram shall be initiated by the signal for turbine control valve fast closure due to a loss of oil pressure to the acceleration relay any time the turbine first stage steam pressure is above a value corresponding to 833 Mwt, i.e., 45 percent of 1850 Mwt. i. The turbine stop valve closure scram shall be initiated at ≤10 percent of valve closure setting (Stem position) from full open whenever the turbine first stage steam pressure is above a value corresponding to 833 Mwt, i.e., 45 percent of 1850 Mwt.

However, in response to expressed beliefs[7] that variation of APRM flux scram with recirculation flow is a prudent measure to assure safe plant operation during the design confirmation phase of plant operation, the scram setting will be varied with recirculation flow.

An increase in the APRM scram trip setting would decrease the margin present before the fuel cladding integrity safety limit is reached. The APRM scram trip setting was determined by an analysis of margins required to provide a reasonable range for maneuvering during operation. Reducing this operating margin would increase the frequency of spurious scrams which have an adverse effect on reactor safety because of the resulting thermal stresses. Thus, the APRM scram trip setting was selected because it provides adequate margin for the fuel cladding integrity safety limit yet allows operating margin that reduces the possibility of unnecessary scrams.

The scram trip setting must be adjusted to ensure that the LHGR transient peak is not increased for any combination of FRTP and CMFLPD. The scram setting is adjusted in accordance with Specification 2.1.1a when the core maximum fraction of limiting power density exceeds the fraction of rated thermal power.

Reactor power level may be varied by moving control rods or by varying the recirculation flow rate. The APRM system provides a control rod block to prevent rod withdrawal beyond a given point at a constant recirculation flow rate, and thus to protect against the condition of a MCPR less than the SLCPR. This rod block trip setting, which is automatically varied with recirculation flow rate, prevents an increase in the reactor power level to excessive values due to control rod withdrawal. The flow variable trip setting provides substantial margin from fuel damage, assuming a steady-state operation at the trip setting, over the entire recirculation flow range. The margin to the safety limit increases as the flow decreases for the specified trip setting versus flow relationship; therefore, the worst case MCPR which could occur during steady-state operation is at 110% of rated thermal power because of the APRM rod block trip setting. The actual power distribution in the core is established by specified control rod sequences and is monitored continuously by the in-core LPRM system. As with the APRM scram trip setting, the APRM rod block trip setting is adjusted downward if the core maximum fraction of limiting power density exceeds the fraction of rated thermal power, thus, preserving the APRM rod block safety margin.

b. Normal operation of the automatic recirculation pump control will be in excess of 30% of rated flow; therefore, little operation below 30% flow is anticipated. For operation in the startup mode while the reactor is at low pressure (<800 psia), the IRM range 9 high flux[16, 17] scram setting is calibrated to correspond to 12% of rated neutron flux. The IRM range 9, 12% of rated neutron flux calibration is on a nominal basis, which provides adequate margin between the setpoint and the safety limit at 25% of rated power. The margin is also adequate to accommodate anticipated maneuvers associated with plant startup. There are a few possible sources of rapid reactivity input to the system in the low power flow condition. Effects of increasing pressure at zero or low void content are minor, cold water from sources available during startup is not much colder

than that already in the system, temperature coefficients are small, and control rod patterns are constrained to be uniform by operating procedures backed up by the rod worth minimizer. Worth of individual rods is very low in a uniform rod pattern. Thus, of all possible sources of reactivity input, uniform control rod withdrawal is the most probable cause of significant power rise. Because the flux distribution associated with uniform rod withdrawals does not involve high local peaks, and because several rods must be removed to change power by a significant percentage of rated, the rate of power rise is very slow. Generally, the heat flux is in near equilibrium with the fission rate. In an assumed uniform rod withdrawal approach to the scram level, the rate of power rise is no more than 5% of rated per minute, and the IRM system would be more than adequate to assure a scram before the power could exceed the safety limit.

Procedural controls will assure that the IRM scram is maintained for low flow condition. This is accomplished by keeping the IRMs on range 9 until 20% flow is exceeded and reactor pressure is >850 psig and that control rods shall not be withdrawn if recirculation flow is less than 30%. If the APRMs are onscale, then the reactor mode switch may be placed in run, thereby switching scram protection from the IRM to the APRM system. If the APRMs are not onscale, then operation with the mode switch in startup (including normal startup mode steam chest warming and bypass valve operation) may continue using IRM range 10, provided that the main turbine generator is not placed in operation.

To continue operation with the mode switch in startup beyond 12% of rated neutron flux, the IRMs must be transferred into range 10. The Reactor Protection System is designed such that reactor pressure must be above 850 psig to successfully transfer the IRMs into range 10, thus assuring added protection for the fuel cladding safety limit. The RPS design will cause the low reactor pressure main-steam-line isolation to be unbypassed when one IRM in trip system 11 and one IRM in trip system 12 are placed in range 10. Procedural controls assure that IRM range 9 is maintained on all IRM channels up to 850 psig reactor pressure. The IRM scram remains active until the mode switch is placed in the RUN position at which time the scram function is transferred to APRMs.

The adequacy of the IRM scram in range 10 was determined by comparing the scram level on the IRM range 10 to the minimum APRM scram level. The IRM scram is at approximately 38.4% of rated neutron flux while the minimum flow biased APRM scram which occurs at zero recirculation flow is at 65% of rated power. Therefore, startup mode transients (i.e., those not including turbine operation) requiring a scram based on a flux excursion will be terminated sooner with an IRM Range 10 scram than with an APRM scram.

Above the RWM low power setpoint of rated power, the ability of the IRMs to terminate a rod withdrawal transient is limited due to the number and location of IRM detectors. An evaluation was performed that showed by maintaining a minimum core flow of 20.25×10^6 lb/hr (30% rated flow) in range 10, a complete rod withdrawal initiated below 40% of rated power would not result in violating the fuel cladding safety limit. Normal operation of the automatic recirculation pump control will be in excess of 30% rated flow; therefore, little operation below 30% flow is anticipated. Therefore, IRM upscale rod block and scram in range 10 provide adequate protection against a rod withdrawal error transient.

The IRM Limiting Safety System Setting 2.1.2.b for IRM range 9 of <12% rated neutron flux and IRM range 10 of <38.4% of rated neutron flux are nominal trip setpoints as defined by GE Setpoint Methodology as outlined in NEDC-31336. The calibration of these Limiting Safety System Setting values is completed by adjusting IRM amplifier gain such that IRM indication is correlated to rated neutron flux. With the IRM indication correlated to neutron flux, the IRM upscale on range 9 corresponds to 12% and range 10 to 38.4% of rated neutron flux, respectively.

For IRM operation in range 9 or less, in order to ensure that the IRM provided adequate protection against the single rod withdrawal error, a range of rod withdrawal accidents was analyzed. This analysis included starting the accident at various power levels. The most severe case involves an initial condition in which the reactor is just subcritical and the IRM system is not yet on scale. This condition exists at quarter rod density. Additional conservatism was taken in this analysis by assuming that the IRM channel closest to the withdrawn rod is bypassed. The results of this analysis show that the reactor is scrammed and peak power limited to 1% of rated power, thus maintaining a limit above the SLCPR. Based on the above analysis, the IRM provides protection against local control rod withdrawal errors and continuous withdrawal of control rods in sequence and provides backup protection for the APRM.

c. As demonstrated in UFSAR Section XV-A and B, the reactor high pressure scram is a backup to the neutron flux scram, turbine stop valve closure scram, generator load rejection scram, and main steam isolation valve closure scram, for various reactor isolation incidents. However, rapid isolation at lower power levels generally results in high pressure scram preceding other scrams because the transients are slower and those trips associated with the turbine generator are bypassed.

   The operator will set the trip setting at 1080 psig or lower. However, the actual set point can be as much as 15.8 psi above the 1080 psig indicated set point due to the deviations discussed above.

d. A reactor water low level scram trip setting -12 inches (53 inches indicator scale) relative to the minimum normal water level (Elevation 302'9") will assure that power production will be terminated with adequate coolant remaining in the core. The analysis of the feedwater pump loss in UFSAR Section XV-B.3.13 has demonstrated that approximately 4 feet of water remains above the core following the low level scram.

   The operator will set the low level trip setting no lower than -12 inches relative to the lowest normal operating level. However, the actual set point can be as much as 2.6 inches lower due to the deviations discussed above.

e. A reactor water low-low level signal -5 feet (5 inches indicator scale) relative to the minimum normal water level (Elevation 302'9") will assure that core cooling will continue even if level is dropping. Core spray cooling will adequately cool the core, as discussed in LCO 3.1.4.

   The operator will set the low-low level core spray initiation point at no less than -5 feet (5 inches indicator scale) relative to the minimum normal water level (Elevation 302'9"). However, the actual set point can be as much as 2.6 inches lower due to the deviations discussed above.

f-g. The low pressure isolation of the main steam lines at 850 psig was provided to give protection against fast reactor depressurization and the resulting rapid cooldown of the vessel. Advantage was taken of the scram feature which occurs when the main steam line isolation valves are closed, to provide for reactor shutdown so that high power operation at low reactor pressure does not occur, thus providing protection for the fuel cladding integrity safety limit. Operation of the reactor at pressures lower than 850 psig requires that the reactor mode switch be in the startup position and the IRMs on range 9 or lower, where protection of the fuel cladding integrity safety limit is provided by the IRM high neutron flux scram. Thus, the combination of main steam line isolation on reactor low pressure and isolation valve closure scram assures the availability of neutron flux scram protection over the entire range of applicability of the fuel cladding integrity safety limit. In addition, the isolation valve closure scram anticipates the pressure and flux transients which occur during normal or inadvertent isolation valve closure. With the scrams set at ≤10% valve closure, there is no increase in neutron flux and peak pressure if the vessel dome is limited to 1141 psig. [8, 9, 10].

The operator will set the pressure trip at greater than or equal to 850 psig and the isolation valve stem position scram setting at less than or equal to 10% of valve stem position from full open. However, the actual pressure set point can be as much as 15.8 psi lower than the indicated 850 psig and the valve position set point can be as much as 2.5% of stem position greater. These allowable deviations are due to instrument error, operator setting error and drift with time.

In addition to the above mentioned Limiting Safety System Setting, other reactor protection system devices (LCO 3.6.2) serve as a secondary backup to the Limiting Safety System Setting chosen. These are as follows:

High fission product activity released from the core is sensed in the main steam lines by the high radiation main steam line monitors. These monitors provide a backup scram signal and also close the main steam line isolation valves.

The scram dump volume high level scram trip assures that scram capability will not be impaired because of insufficient scram dump volume to accommodate the water discharged from the control rod drive hydraulic system as a result of a reactor scram (Section X-C.2.10)*.

h. The generator load rejection scram is provided to anticipate the rapid increase in pressure and neutron flux resulting from fast closure of the turbine control valves due to the worst case transient of a load rejection and subsequent failure of the bypass. In fact, analysis [9,10] shows that heat flux does not increase from its initial value at all because of the fast action of the load rejection scram; thus, no significant change in MCPR occurs.

i. The turbine stop valve closure scram is provided for the same reasons as discussed in h above. With a scram setting of ≤10% valve closure, the resultant transients are nearly the same as for those described in i above; and, thus, adequate margin exists.

*UFSAR

(1) General Electric BWR Thermal Analysis Basis (GETAB) Data, Correlation and Design Application, NEDO-10958 and NEDE-10958.

(2) Linford, R. B., "Analytical Methods of Plant Transient Evaluations for the General Electric Boiling Water Reactor," NEDO-10801, February 1973.

(3) UFSAR Section XV-A and B.

(4) UFSAR Section XV-A and B.

(5) UFSAR Section XV-A and B.

(6) UFSAR Section XV-A and B.

(7) Letters, Peter A. Morris, Director of Reactor Licensing, USAEC, to John E. Logan, Vice-President, Jersey Central Power and Light Company, dated November 22, 1967 and January 9, 1968.

(8) UFSAR Section XV-A and B.

(9) Letter, T. J. Brosnan, Niagara Mohawk Power Corporation, to Peter A. Morris, Division of Reactor Licensing, USAEC, dated February 28, 1972.

(10) Letter, Philip D. Raymond, Niagara Mohawk Power Corporation, to A. Giambusso, USAEC, dated October 15, 1973.

(11) Nine Mile Point Nuclear Power Station Unit 1 Load Line Limit Analysis, NEDO 24012, May, 1977.

(12) Licensing Topical Report "General Electric Standard Application for Reactor Fuel," NEDE-24011-P-A, latest approved revision.

(13) Nine Mile Point Nuclear Power Station Unit 1, Extended Load Line Limit Analysis, License Amendment Submittal (Cycle 6), NEDO-24185, April 1979.

(14) General Electric SIL 299 "High Drywell Temperature Effect on Reactor Vessel Water Level Instrumentation."

(15) Letter (and attachments) from C. Thomas (NRC) to J. Charnley (GE) dated May 28, 1985, "Acceptance for Referencing of Licensing Topical Report NEDE-24011-P-B, Amendment 10."

(16) GENE-909-16-0393, "IRM/APRM Overlap Analysis for Nine Mile Point Nuclear Station Unit One," Revision 1, dated April 14, 1993.

(17) GENE-909-39-1093, "IRM/APRM Overlap Improvement for Nine Mile Point Nuclear Station Unit One," dated March 8, 1994.

LIMITING CONDITION FOR OPERATION	SURVEILLANCE REQUIREMENT
i. Required Minimum Recirculation Flow Rate for Operation in IRM Range 10 During startup mode of operation in IRM range 10, a minimum recirculation flow rate of 30% of rated core flow is required. Control rods shall not be withdrawn if recirculation flow is less than 30% of rated.	

Reporting Requirements

The LCOs associated with monitoring the fuel rod operating conditions are required to be met at all times, i.e., there is no allowable time in which the plant can knowingly exceed the limiting values of MAPLHGR, LHGR, MCPR, or Power/Flow Ratio. It is a requirement, as stated in Specifications 3.1.7a, b, c, and d that if at any time during power operation it is determined that the limiting values for MAPLHGR, LHGR, MCPR, or Power/Flow Ratio are exceeded, action is then initiated to restore operation to within the prescribed limits. This action is initiated as soon as normal surveillance indicates that an operating limit has been reached. Each event involving operation beyond a specified limit shall be reported as a Reportable Occurrence. If the specified corrective action described in the LCOs was taken, a thirty-day written report is acceptable.

Operations Beyond the End-of-Cycle (Coastdown)

The General Electric generic BWR analysis of coastdown operation (Reference 17) concludes that operation beyond the end-of-cycle (coastdown) is acceptable. Amendment No. 7 to GESTAR (Reference 18) concludes that the analysis conservatively bounds coastdown operation to forty (40) percent power. The margin to all safety limits analyzed increased linearly as the power decreased.

Required Minimum Recirculation Flow Rate for Operation in IRM Range 10

During power operation above the low power setpoint of 20% power and less than 40% power when in IRM range 10 with the mode switch in startup, the control rod withdrawal error analysis requires the minimum flow to be greater than 30% to ensure protection against the SLMCPR for control rod withdrawal error to the full out position. To ensure compliance with this analysis, the LCO prohibits control rod withdrawal in IRM range 10 if recirculation flow is less than 30%. This is procedurally controlled. This minimum flow restriction does not apply in the run mode.

TABLE 3.6.2a (cont'd)

INSTRUMENTATION THAT INITIATES SCRAM

Limiting Condition for Operation

Parameter	Minimum No. of Tripped or Operable Trip Systems	Minimum No. of Operable Instrument Channels per Operable Trip System	Set Point	Reactor Mode Switch Position in Which Function Must Be Operable: Shutdown	Refuel	Startup	Run
(6) Main-Steam-Line Isolation Valve Position	2	4(h)(o)	≤ 10 percent valve closure from full open		(c)	(c)	x
(7) High Radiation Main-Steam-Line	2	2(o)	≤ 5 times normal background at rated power		x	x	x
(8) Shutdown Position of Reactor Mode Switch	2	1	---		(k)	x	x
(9) Neutron Flux							
(a) IRM							
(i) Upscale	2	3(d)(o)	≤[118/125] divisions of full scale		x	x	

TABLE 3.6.2a (cont'd)

INSTRUMENTATION THAT INITIATES SCRAM

Limiting Condition for Operation

Parameter	Minimum No. of Tripped or Operable Trip Systems	Minimum No. of Operable Instrument Channels per Operable Trip System	Set Point	Reactor Mode Switch Position in Which Function Must Be Operable			
				Shutdown	Refuel	Startup	Run
(ii) Inoperative	2	3(d)(o)	---		x	x	
(b) APRM							
(i) Upscale	2	3(e)(o)	Specification 2.1.2a		x	x	x
(ii) Inoperative	2	3(e)(o)	---		x	x	x
(10) Turbine Stop Valve Closure	2	4(o)	≤ 10% valve closure				(i)
(11) Generator Load Rejection	2	2(o)	(j)				(i)

TABLE 4.6.2a (cont'd)

INSTRUMENTATION THAT INITIATES SCRAM

Surveillance Requirement

Parameter	Sensor Check	Instrument Channel Test	Instrument Channel Calibration
(8) Shutdown Position of Reactor Mode Switch	None	Once during each major refueling outage	None
(9) Neutron Flux			
(a) IRM			
(i) Upscale	Once per 12 hours[f]	Once per week[g]	Once per operating cycle[n]
(ii) Inoperative	Once per 12 hours[f]	Once per week[g]	Once per operating cycle[n]
(b) APRM			
(i) Upscale	Once per 12 hours	Once per 3 months	Once per week[m] Once per 3 months
(ii) Inoperative	None	Once per 3 months	None
(10) Turbine Stop Valve Closure	None	Once per 3 months	Once per operating cycle
(11) Generator Load Rejection	None	Once per 3 months	Once per 3 months

(a) May be bypassed when necessary for containment inerting.

(b) May be bypassed in the refuel and shutdown positions of the reactor mode switch with a keylock switch.

(c) May be bypassed in the refuel and startup positions of the reactor mode switch when reactor pressure is less than 600 psi, or for the purpose of performing reactor coolant system pressure testing and/or control rod scram time testing with the reactor mode switch in the refuel position.

(d) No more than one of the four IRM inputs to each trip system shall be bypassed.

(e) No more than two C or D level LPRM inputs to an APRM shall be bypassed and only four LPRM inputs to an APRM shall be bypassed in order for the APRM to be considered operable. No more than one of the four APRM inputs to each trip system shall be bypassed provided that the APRM in the other instrument channel in the same core quadrant is not bypassed. A Traversing In-Core Probe (TIP) chamber may be used as a substitute APRM input if the TIP is positioned in close proximity to the failed LPRM it is replacing.

(f) Verify SRM/IRM channels overlap during startup after the mode switch has been placed in startup. Verify IRM/APRM channels overlap at least 1/2 decade during entry into startup from run (normal shutdown) if not performed within the previous 7 days.

(g) Within 24 hours before startup, if not performed within the previous 7 days. Not required to be performed during shutdown until 12 hours after entering startup from run.

(h) Each of the four isolation valves has two limit switches. Each limit switch provides input to one of two instrument channels in a single trip system.

(i) May be bypassed when reactor power level is below 45%.

(j) Trip upon loss of oil pressure to the acceleration relay.

(k) May be bypassed when placing the reactor mode switch in the SHUTDOWN position and all control rods are fully inserted.

(l) Only the trip circuit will be calibrated and tested at the frequencies specified in Table 4.6.2a, the primary sensor will be calibrated and tested once per operating cycle.

(m) This calibration shall consist of the adjustment of the APRM channel to conform to the power values calculated by a heat balance during reactor operation when THERMAL POWER ≥ 25% of RATED THERMAL POWER. Adjust the APRM channel if the absolute difference is greater than 2% of RATED THERMAL POWER. Any APRM channel gain adjustment made in compliance with Specification 2.1.2a shall not be included in determining the absolute difference.

(n) Neutron detectors are excluded.

TABLE 3.6.2b (cont'd)

INSTRUMENTATION THAT INITIATES PRIMARY COOLANT SYSTEM OR CONTAINMENT ISOLATION

Limiting Condition for Operation

Parameter	Minimum No. of Tripped or Operable Trip Systems	Minimum No. of Operable Instrument Channels per Operable Trip System	Set Point	Reactor Mode Switch Position in Which Function Must Be Operable			
				Shutdown	Refuel	Startup	Run
(4) High Radiation Main Steam Line	2	2(f)	≤ 5 times normal background at rated power			x	x
(5) Low Reactor Pressure	2	2(f)	≥ 850 psig			(h)	x
(6) Low-Low-Low Condenser Vacuum	2	2(f)	≥ 7 in. mercury vacuum			(a)	x
(7) High Temperature Main Steam Line Tunnel	2	2(f)	≤ 200°F			x	x

(g) A channel may be placed in an inoperable status for up to 6 hours for required surveillances without placing the Trip System in tripped condition provided at least one Operable Instrument Channel in the same Trip System is monitoring that Parameter.

With the number of Operable channels one less than required by the Minimum Number of Operable Instrument Channels for the Operable Trip System, either

1. Place the inoperable channel(s) in the tripped condition within 24 hours.

or

2. Take the ACTION required by Specification 3.6.2a for that Parameter.

(h) Only applicable during startup mode while operating in IRM range 10.

TABLE 3.6.2g

INSTRUMENTATION THAT INITIATES CONTROL ROD WITHDRAWAL BLOCK

Limiting Condition for Operation

Parameter	Minimum No. of Tripped or Operable Trip Systems	Minimum No. of Operable Instrument Channels per Operable Trip System (i)	Set Point	Reactor Mode Switch Position in Which Function Must Be Operable			
				Shutdown	Refuel	Startup	Run
(1) SRM							
a. Detector not in Startup Position	2	2(a)(e)	---		x	x	
b. Inoperative	2	2(a)	---		x	x	
c. Upscale	2	2(a)	$\leq 9 \times 10^4$ counts/sec		x	x	
(2) IRM							
a. Detector not in Startup Position	2	3(b)	---		x	x	
b. Inoperative	2	3(b)	---		x	x	

TABLE 3.6.2g (cont'd)

INSTRUMENTATION THAT INITIATES CONTROL ROD WITHDRAWAL BLOCK

Limiting Condition for Operation

Parameter		Minimum No. of Tripped or Operable Trip Systems	Minimum No. of Operable Instrument Channels per Operable Trip System (i)	Set Point	Reactor Mode Switch Position in Which Function Must Be Operable			
					Shutdown	Refuel	Startup	Run
c.	Downscale	2	3(b)	≥[7.75/125] divisions of full scale		x	x	
d.	Upscale	2	3(b)	≤[108/125] divisions of full scale		x	x	
(3)	APRM							
a.	Inoperative	2(h)	3(c)	---		x	x	x
b.	Upscale (Biased by Recirculation Flow)	2(h)	3(c)	Specification 2.1.2a(h)		x	x	x
c.	Downscale	2(h)	3(c)	≥[5.28/125] divisions of full scale		(d)	(d)	x

TABLE 4.6.2g

INSTRUMENTATION THAT INITIATES CONTROL ROD WITHDRAWAL BLOCK

Surveillance Requirement

Parameter	Sensor Check	Instrument Channel Test	Instrument Channel Calibration
(1) SRM			
a. Detector Not in Startup Position	N/A	Once per week(g)	N/A
b. Inoperative	N/A	Once per week(g)	N/A
c. Upscale	N/A	Once per week(g)	Once per operating cycle(k)
(2) IRM			
a. Detector not in Startup Position	N/A	Once per week(j)	N/A
b. Inoperative	N/A	Once per week(j)	N/A
c. Downscale	N/A	Once per week(j)	Once per operating cycle(k)
d. Upscale	N/A	Once per week(j)	Once per operating cycle(k)

NOTES FOR TABLES 3.6.2g and 4.6.2g

(a) No more than one of the four SRM inputs to the single trip system shall be bypassed.

(b) No more than one of the four IRM inputs to each instrument channel shall be bypassed. These signals may be bypassed when the APRMs are onscale.

(c) No more than one of the four APRM inputs to each instrument channel shall be bypassed provided that the APRM in the other instrument channel in the same core quadrant is not bypassed. No more than two C or D level LPRM inputs to an APRM shall be bypassed and only four LPRM inputs to only one APRM shall be bypassed in order for the APRM to be considered operable. In the Run mode of operation, bypass of two chambers from one radial core location in any one APRM shall cause that APRM to be considered inoperative. A Travelling In-Core Probe (TIP) chamber may be used as a substitute APRM input if the TIP is positioned in close proximity to the failed LPRM it is replacing. If one APRM in a quadrant is bypassed and meets all requirements for operability with the exception of the requirement of at least one operable chamber at each radial location, it may be returned to service and the other APRM in that quadrant may be removed from service for test and/or calibration only if no control rod is withdrawn during the calibration and/or test.

(d) May be bypassed in the startup and refuel positions of the reactor mode switch when the IRMs are onscale.

(e) This function may be bypassed when the count rate is ≥ 100 cps.

(f) One sensor provides input to each of two instrument channels. Each instrument channel is in a separate trip system.

(g) Within 24 hours before startup, if not performed within the previous 7 days. Not required to be performed until 12 hours after IRMs are on range 2 or below.

(h) The actuation of either or both trip systems will result in a rod block.

(i) A channel may be placed in an inoperable status for up to 6 hours for required surveillance without placing the Trip System in the tripped condition, provided at least one other operable channel in the same Trip System is monitoring that Parameter.

(j) Within 24 hours before startup, if not performed within the previous 7 days. Not required to be performed when entering startup from run until 12 hours after entering startup.

(k) Neutron detectors are excluded.

The set points on the generator load rejection and turbine stop valve closure scram trips are set to anticipate and minimize the consequences of turbine trip with failure of the turbine bypass system as described in the bases for Specification 2.1.2. Since the severity of the transients is dependent on the reactor operating power level, bypassing of the scrams below the specified power level is permissible.

Although the operator will set the setpoints at the values indicated in Tables 3.6.2.a-1, the actual values of the various set points can differ appreciably from the value the operator is attempting to set. The deviations include inherent instrument error, operator setting error and drift of the set point. These errors are compensated for in the transient analyses by conservatism in the controlling parameter assumptions as discussed in the bases for Specification 2.1.2. The deviations associated with the set points for the safety systems used to mitigate accidents have negligible effect on the initiation of these systems. These safety systems have initiation times which are orders of magnitude greater than the difference in time between reaching the nominal set point and the worst set point due to error. The maximum allowable set point deviations are listed below:

Neutron Flux

APRM Scram, ±2.3% of rated neutron flux (analytical limit is 120% of rated flux)
APRM Rod Block, ±2.3% of rated neutron flux (analytical limit is 110% of rated flux)

The IRM and SRM upscale and downscale setpoints have been derived based on GE setpoint methodology as outlined in NEDC-31336, "GE Instrumentation Setpoint Methodology." In this methodology, the setpoint is defined as three values, Nominal Trip Setpoint, Allowable Value, and Analytical Limit. Table 3.6.2a and 3.6.2g show nominal trip setpoints. The corresponding allowable values are as follows:

IRM Upscale Scram, allowable value is ≤[120/125] divisions of full scale
SRM Upscale Rod Block, allowable value is $\leq 2.00 \times 10^5$ cps
IRM Upscale Rod Block, allowable value is ≤[112/125] divisions of full scale
IRM Downscale Rod Block, allowable value is ≥[5.76/125] divisions of full scale
APRM Downscale Rod Block, allowable value is ≥[4.24/125] divisions of full scale

Recirculation Flow Upscale, ±1.6% of rated recirculation flow (analytical limit is 107.1% of rated flow)
Recirculation Flow Comparator, ±2.09% of rated recirculation flow (analytical limit is 10% flow differential)

Reactor Pressure, ±15.8 psig

Containment Pressure ±0.053 psig

Reactor Water Level, ±2.6 inches of water

Main Steam Line Isolation Valve Position, ±2.5% of stem position

Scram Discharge Volume, +0 and -1 gallon

Condenser Low Vacuum, ±0.5 inches of mercury

ATTACHMENT B

Niagara Mohawk Power Corporation
License No. DPR-63
Docket No. 50-220

Supporting Information and No Significant Hazards Consideration Analysis

BACKGROUND

Nine Mile Point Unit 1 has been experiencing difficulty in changing the mode switch position from startup to run without significantly increasing the APRM gains and bypassing certain LPRMs. The proposed change will use an additional tenth range on the IRMs, increasing the neutron monitoring range for the IRMs from 12 percent to approximately 40 percent of rated neutron flux. This will significantly increase the IRM/APRM system overlap and allow for a smoother transition from the startup to run mode.

The proposed IRM range 10 modification expands the operating region for the IRMs to correspond to a range from 0 to approximately 40 percent of rated neutron flux. The expanded overlap capability ensures continuous monitoring capability during transition from IRMs to APRMs. Therefore, the IRM upscale/APRM downscale coincident scram function can be replaced with an overlap surveillance similar to that for BWR 4, 5 and 6's. This surveillance requires that during a controlled shutdown the IRMs be verified to be onscale with at least 1/2 decade in neutron flux indication prior to reaching the APRM downscale setpoint and prior to changing modes from run to startup. Also, with this expanded overlap between the IRM and APRM Systems, the transition from startup to run can be accomplished at power levels sufficient to ensure that the IRMs remain below the IRM upscale trip and the APRMs have cleared the downscale trips with sufficient margin that the mode switch change can be accomplished without incident. These changes have been reviewed by General Electric and documented in GENE-909-16-0393, "IRM/APRM Overlap Analysis for Nine Mile Point Nuclear Station Unit One," Revision 1, and GENE-909-39-1093, "IRM/APRM Overlap Improvement for Nine Mile Point Nuclear Station Unit One."

Equipment associated with the Neutron Monitoring System requires periodic calibration to ensure that instrument inaccuracy and drift do not affect the ability of the system to perform its safety function. Table 4.6.2.a note "f" and Table 4.6.2.g note "g" require that instrument loops be calibrated prior to normal startup and shutdown, which could impact plant startup by approximately one day. As part of the overall effort to improve the operation of the Neutron Monitoring System, the design basis for the setpoints and the calibration requirements for these systems in Technical Specifications were re-evaluated. The Technical Specification setpoints, compatible with a surveillance interval of once per refueling cycle (24 months +25 percent), were then defined using the methodology contained in NEDC-31336, "GE Instrument Setpoint Methodology."

DESCRIPTION OF PROPOSED CHANGES

The following Technical Specification changes are required to implement the modifications and change in surveillance interval.

Limiting Safety System Setting 2.1.2b

Existing: The IRM scram trip setting shall not exceed 12% of rated neutron flux.

Proposed: The IRM scram trip setting shall not exceed 12% of rated neutron flux for IRM range 9 or lower.

The IRM scram trip setting shall not exceed 38.4% of rated neutron flux for IRM range 10.

Limiting Safety System Setting 2.1.2f

Existing: The reactor low pressure setting for main-steam-line isolation valve closure shall be ≥850 psig when the reactor mode switch is in the run position.

Proposed: The reactor low pressure setting for main-steam-line isolation valve closure shall be ≥850 psig when the reactor mode switch is in the run position or the IRMs are on range 10.

Bases for 2.1.2, "Fuel Cladding-Limiting System Safety Setting"

The Bases have been revised to reflect the changes to Limiting Safety System Setting as proposed above. Refer to Attachment A pages 18 through 21.

References for Bases 2.1.1 and 2.1.2 Fuel Cladding

The following references are added:

(16) GENE-909-16-0393, "IRM/APRM Overlap Analysis for Nine Mile Point Nuclear Station Unit One," Revision 1, dated April 14, 1993.

(17) GENE-909-39-1093, "IRM/APRM Overlap Improvement for Nine Mile Point Nuclear Station Unit One, "dated March 8, 1994.

Limiting Condition for Operation 3.1.7i

The following item i is added:

i. Required Minimum Recirculation Flow Rate for Operation in IRM Range 10

During startup mode of operation in IRM range 10, a minimum recirculation flow rate of 30% of rated core flow is required. Control rods shall not be withdrawn if recirculation flow is less than 30% of rated.

Bases for 3.1.7 and 4.1.7 Fuel Rods

The following is added to the bases:

Required Minimum Recirculation Flow Rate for Operation in IRM Range 10

During power operation above the low power setpoint of 20% power and less than 40% power when in IRM range 10 with the mode switch in startup, the control rod withdrawal error analysis requires the minimum flow to be greater than 30% to ensure protection against the SLMCPR for control rod withdrawal error to the full out position. To ensure compliance with this analysis, the LCO prohibits control rod withdrawal in IRM range 10 if recirculation flow is less than 30%. This is procedurally controlled. This minimum flow restriction does not apply in the run mode.

Table 3.6.2a Instrumentation that Initiates Scram (Limiting Condition for Operation)

Existing:

	Parameter			Setpoint	Reactor Mode Switch Position in Which Function Must Be Operable			
					Shutdown	Refuel	Startup	Run
(9)	Neutron Flux							
	(a)	IRM						
		(i)	Upscale	≤96 percent of full scale		(g)	(g)	(g)
		(ii)	...					
	(b)	APRM						
		(i)	...					
		(ii)	...					
		(iii)	Downscale	≥5 percent of full scale		(g)	(g)	(g)

Proposed:

	Parameter			*Setpoint*	*Reactor Mode Switch Position in Which Function Must Be Operable*			
					Shutdown	*Refuel*	*Startup*	*Run*
(9)	*Neutron Flux*							
	(a)	*IRM*						
		(i)	*Upscale*	*≤[118/125] divisions of full scale*		*x*	*x*	
		(ii)	*...*					
	(b)	*APRM*						
		(i)	*...*					
		(ii)	*...*					

Table 4.6.2a Instrumentation that Initiates Scram (Surveillance Requirement)

Existing:

			Parameter	Sensor Check	Instrument Channel Test	Instrument Channel Calibration
(9)	Neutron Flux					
	(a)	IRM				
		(i)	Upscale	(f)	(f)	(f)
		(ii)	Inoperative	(f)	(f)	(f)
	(b)	APRM				
		(i)	Upscale...			
		(ii)	Inoperative...			
		(iii)	Downscale	None	Once per 3 Months	Once per Week(m) Once per 3 Months

Proposed:

			Parameter	*Sensor Check*	*Instrument Channel Test*	*Instrument Channel Calibration*
(9)	*Neutron Flux*					
	(a)	*IRM*				
		(i)	*Upscale*	*Once per 12 hours(f)*	*Once per week(g)*	*Once per operating cycle(n)*
		(ii)	*Inoperative*	*Once per 12 hours(f)*	*Once per week(g)*	*Once per operating cycle(n)*

(b)	*APRM*			
(i)	*Upscale*	*Once per 12 Hours*	*Once per 3 Months*	*Once per Week[(m)]* *Once per 3 Months*
(ii)	*Inoperative...*			

Notes for Tables 3.6.2a and 4.6.2a

Existing: (f) Calibrate prior to startup and normal shutdown and thereafter check once per shift and test once per week until no longer required.

(g) IRM's are bypassed when APRM's are on scale. APRM downscale is bypassed when IRM's are onscale.

Proposed: *(f)* *Verify SRM/IRM channels overlap during startup after the mode switch has been placed in startup. Verify IRM/APRM channels overlap at least 1/2 decade during entry into startup from run (normal shutdown) if not performed within the previous 7 days.*

(g) *Within 24 hours before startup, if not performed within the previous 7 days. Not required to be performed during shutdown until 12 hours after entering startup from run.*

(n) *Neutron detectors are excluded.*

Table 3.6.2.b, Instrumentation that Initiates Primary Coolant System or Containment Isolation (Limiting Condition for Operation)

Existing:

	Parameter	Reactor Mode Switch Position in Which Function Must be Operable: Shutdown	Refuel	Startup	Run
(5)	Low Reactor Pressure				x

Proposed:

Parameter	*Reactor Mode Switch Position in Which Function Must be Operable* Shutdown	Refuel	Startup	Run
(5) Low Reactor Pressure			(h)	x

Notes for Tables 3.6.2b and 4.6.2b

Add note (h) as follows:

(h) Only applicable during startup mode while operating in IRM range 10.

Table 3.6.2g, Instrumentation that Initiates Control Rod Withdrawal Block (Limiting Condition for Operation)

Existing:	Parameter		Setpoint
(1)	SRM		
	a.	...	
	b.	...	
	c.	Upscale	$\leq 10^5$ counts/sec
(2)	IRM		
	a.	...	
	b.	...	
	c.	Downscale	≥5 percent of full scale for each scale
	d.	Upscale	≤88 percent of full scale for each scale
(3)	APRM		
	a.	...	
	b.	...	
	c.	Downscale	≥2 percent of full scale

Proposed:		*Parameter*	*Setpoint*
(1)	*SRM*		
	a.	*...*	
	b.	*...*	
	c.	*Upscale*	*≤9 x 10^4 counts/sec*
(2)	*IRM*		
	a.	*...*	
	b.	*...*	
	c.	*Downscale*	*≥[7.75/125] divisions of full scale*
	d.	*Upscale*	*≤[108/125] divisions of full scale*
(3)	*APRM*		
	a.	*...*	
	b.	*...*	
	c.	*Downscale*	*≥[5.28/125] divisions of full scale*

Table 4.6.2g, Instrumentation that Initiates Control Rod Withdrawal Block (Surveillance Requirement)

Existing:

		Parameter	Instrument Channel Test	Instrument Channel Calibration
(1)	SRM			
	a.	Detector not in Startup Position	(g)	N/A
	b.	Inoperative	(g)	N/A
	c.	Upscale	(g)	(g)
(2)	IRM			
	a.	Detector not in Startup Position	(g)	N/A
	b.	Inoperative	(g)	N/A
	c.	Downscale	(g)	(g)
	d.	Upscale	(g)	(g)

Proposed:

		Parameter	*Instrument Channel Test*	*Instrument Channel Calibration*
(1)	*SRM*			
	a.	*Detector not in Startup Position*	*Once per week[(g)]*	*N/A*
	b.	*Inoperative*	*Once per week[(g)]*	*N/A*
	c.	*Upscale*	*Once per week[(g)]*	*Once per operating cycle[(k)]*
(2)	*IRM*			
	a.	*Detector not in Startup Position*	*Once per week[(j)]*	*N/A*
	b.	*Inoperative*	*Once per week[(j)]*	*N/A*
	c.	*Downscale*	*Once per week[(j)]*	*Once per operating cycle[(k)]*
	d.	*Upscale*	*Once per week[(j)]*	*Once per operating cycle[(k)]*

Notes for Tables 3.6.2g and 4.6.2g

Existing: (g) Calibrate and/or test prior to startup and normal shutdown. Thereafter, test once per week until no longer required.

Proposed: (g) Within 24 hours before startup, if not performed within the previous 7 days. Not required to be performed until 12 hours after IRMs are on range 2 or below.

Add note (j) and (k):

(j) Within 24 hours before startup, if not performed within the previous 7 days. Not required to be performed when entering startup from run until 12 hours after entering startup.

(k) Neutron detectors are excluded.

Bases for 3.6.2 and 4.6.2, Protective Instrumentation

Existing: Neutron Flux

APRM Scram, ±2.3% of rated neutron flux (analytical limit is 120% of rated flux)
APRM Rod Block, ±2.3% of rated neutron flux (analytical limit is 110% of rated flux)
IRM, ±2.5% of rated neutron flux

Proposed: Neutron Flux

APRM Scram, ±2.3% of rated neutron flux (analytical limit is 120% of rated flux)
APRM Rod Block, ±2.3% of rated neutron flux (analytical limit is 110% of rated flux)

The IRM and SRM upscale and downscale setpoints have been derived based on GE setpoint methodology as outlined in NEDC-31336, "GE Instrumentation Setpoint Methodology." In this methodology, the setpoint is defined as three values, Nominal Trip Setpoint, Allowable Value, and Analytical Limit. Table 3.6.2a and 3.6.2g show nominal trip setpoints. The corresponding allowable values are as follows:

IRM Upscale Scram, allowable value is ≤[120/125] divisions of full scale
SRM Upscale Rod Block, allowable value is ≤2.00×10^5 cps
IRM Upscale Rod Block, allowable value is ≤[112/125] divisions of full scale
IRM Downscale Rod Block, allowable value is ≥[5.76/125] divisions of full scale
APRM Downscale Rod Block, allowable value is ≥[4.24/125] divisions of full scale

EVALUATION

IRM Range 10

During a reactor startup or shutdown, Nine Mile Point Unit 1 operating procedures require the operator to change the mode switch between startup and run when the IRMs are in range 9. This requires increasing the gains of the APRMs and declaring LPRMs inoperative, thus causing operational difficulty because of the narrow IRM/APRM overlap when switching modes in IRM range 9. IRM range 10 will be used to increase the overlap and thus greatly reduce operational difficulties and eliminate potential unnecessary plant scrams.

In order to assure fuel cladding integrity, Safety Limit 2.1.1.b requires core power not to exceed 25 percent of rated thermal power when reactor pressure is less than or equal to 800 psia or core flow is less than 10 percent. For IRM range 9 this is accomplished by

Limiting Safety System Setting 2.1.2.b, which sets the scram setpoint at less than or equal to 12 percent of rated neutron flux. When reactor pressure exceeds 800 psia and core flow is greater than 10 percent, fuel cladding integrity is assured by maintaining the MCPR greater than the SLMCPR (1.07), Safety Limit 2.1.1.a.

Because the capability exists for operation at power levels above 25 percent when on IRM range 10, protection is necessary against a depressurization transient which could drop pressure below 800 psia, thus violating Safety Limit 2.1.1.b. To provide automatic protection against this, the reactor protection system low pressure isolation trip is required to be functional when operating in IRM range 10. The low pressure isolation trip setpoint is 850 psia. Operational procedures will be revised to ensure that switching occurs above this setpoint.

When operating in IRM range 10, power can be increased in the startup mode until such time when all APRMs are on scale. The mode switch can then be readily switched from startup to run without overlap difficulties. Protection against reactivity transients when operating in IRM range 10 are provided by the IRM high flux scram which would occur at approximately 38.4 percent of rated neutron flux, with a rod block occurring at approximately 35 percent of rated neutron flux. Reactor scrams from reactivity insertion transients occurring while in IRM range 10 will occur well before transients initiated under similar conditions while in the run mode. This is because the IRM range 10 high flux scram setpoint is well below the setpoint of the APRM flow biased scram which corresponds to a minimum of 65 percent of rated power at zero recirculation flow.

Potential reactivity insertion transients necessary to be considered for reactor operation in IRM range 10 are the control rod drop accident, the rod withdrawal error transient, and events which would result in injection of cold water. These are discussed below:

Operation in IRM range 10 will have no impact on the control rod drop accident. Control rod drop accident protection is provided by the Rod Worth Minimizer, which ensures through group rod withdrawal sequencing that the effects of a control rod drop accident will be less than the 280 cal/g peak fuel enthalpy design limit. Results of control rod drop accident calculations demonstrate that due to inherent reactivity feedback effects, the impact is significantly reduced above 10 percent power. Technical Specification Section 3.1.1.b.(3)(b) limit for rod worth minimizer operation is set at 20 percent power. Above 20 percent power, analysis has shown that even with multiple operator errors, the peak fuel enthalpy content is less than 280 cal/g.

The rod withdrawal transient assumes continuous withdrawal of a control rod to the fully withdrawn position where both the rod pattern control system and a second licensed operator fails to block the selection of the out-of-sequence rod. Results of the control rod withdrawal error transient are more bounding for lower power levels in the startup range, and all results demonstrate margin to the fuel cladding failure threshold limit of 170 cal/g. Beyond the low power setpoint, which is 20 percent for Nine Mile Point Unit 1, potential control rod withdrawal errors must be shown acceptable against the safety limit MCPR. Generic analyses applicable to Nine Mile Point Unit 1 demonstrate that for power levels less than 40 percent of rated, operation at a core flow higher than 30 percent of rated ensures protection against the safety limit MCPR (1.07) for a control rod withdrawal to the

full out position (unblocked). Therefore, during operation in IRM range 10, the IRM upscale rod block at approximately 35 percent rated neutron flux, the IRM upscale scram of approximately 38.4 percent and the minimum recirculation flow requirement of greater than 30 percent, ensure that a complete rod withdrawal transient to the full out position will not result in violating the fuel cladding safety limit.

Cold water injection transients include inadvertent high pressure coolant injection, loss of feedwater heater events, and improper startup of an idle recirculation loop. Analysis of these events assume maximum injection of cold water into the reactor. The separate analysis and calculations supporting these three transients were based on the reactor scramming from the 120 percent of rated neutron flux trip, no credit was taken for the IRM scram or the flow biased flux scram. All calculations demonstrated significant margin to the licensing basis failure criterion of 170 cal/g total energy deposition. For reactivity transients at low power operation, as is the case here, the cal/g total energy deposition is the appropriate failure criterion rather than MCPR for the rapid portion of these events. This is because the long term thermal power (post excursion) is expected to be low and considerable margin to MCPR exists at these low power levels. On an MCPR basis, the acceptability of cold water injection transients at low powers is supported by the Reload 12 engineering analysis, demonstrating these are non-bounding events, and that the K_f curve is set based on the limiting recirculation flow runout event. Therefore, cold water injection transients occurring during IRM range 10 operation will not result in violating the fuel cladding safety limit.

Coincident APRM Downscale/IRM Upscale Scram Trip

The design basis for the coincident APRM downscale/IRM upscale scram trip in the run mode at NMP1 is to ensure that the IRM/APRM Neutron Monitoring Systems overlap. This coincident scram is active during the transition from the startup to run when the protective function is switched from the IRMs to APRMs. In order to ensure adequate scram protection during this transition, the IRM detectors are maintained in the fully inserted position in run mode until the APRM system is operating above the downscale trip. If in these conditions, the APRM downscales have not cleared, the IRM scram is active and provides backup scram protection to the APRMs.

The basis for the deletion of the coincident scram function is that the IRM range 10 modification expands the IRM/APRM overlap to provide a minimum of 1/2 decade overlap. The expanded overlap capability ensures continuous monitoring capability during the transition from the IRMs to the APRMs. The 1/2 decade overlap capability is ensured by the addition of the IRM/APRM overlap surveillance to the Technical Specifications. This is consistent with Improved Standard Technical Specifications for BWR 4, 5 and 6's.

The evaluation of the deletion of the coincident APRM downscale/IRM upscale scram feature demonstrates that the APRM system redundance and operability requirements coupled with the IRM and APRM system overlap operability requirements ensure that the APRM system upscale scram trip provides the necessary protection against all associated design basis accidents previously evaluated in the UFSAR. In the limiting case, if operator errors are assumed (i.e., prematurely going to the "run" mode during startup or delaying shifting from "run" mode during shutdown resulting in APRM channels being downscale),

the APRM downscale trip will continue to both prohibit control rod withdrawal errors and power ascension during the time period needed to take corrective action required by Technical Specifications, and the 120 percent APRM upscale trip will provide the necessary protection against design basis events previously evaluated in the UFSAR. Therefore, IRM upscale scram trip is not required to ensure protection against design basis events.

The APRM downscale rod block setpoint in Technical Specifications has been reviewed as part of the review of the deletion of the coincident APRM downscale/IRM upscale scram. This review has concluded that the downscale rod block should be changed to reflect the current APRM downscale scram setpoint. The downscale setpoint was reviewed using GE setpoint methodology defined in NEDC-31336 and revised nominal trip setpoints and allowable values derived. The revised APRM downscale rod block nominal trip setpoint is changed to [5.28/125] division of full scale with the corresponding allowable value of [4.24/125], and analytical limit of [2/125].

SRM/IRM Surveillance Frequency

Setpoints in safety-related instruments are selected to provide sufficient margin between the trip setpoint and the safety limits to account for inaccuracies, drift, and calibration uncertainties. Safety limits are established so that there is reasonable assurance that parameters which could challenge the integrity of the reactor physical barriers will remain within acceptable limits during anticipated operational occurrences and accidents. Calibrations are performed on a periodic basis to ensure that setpoints for plant components and instruments that monitor and control emergency systems are maintained within their prescribed limits.

To justify the proposed extension of the calibration interval to once each refueling interval, General Electric evaluated the drift characteristics and setpoints of the SRM/IRM instrumentation in accordance with the approved setpoint methodology documented in GE document NEDC-31336, "GE Instrument Setpoint Methodology." This setpoint methodology was approved by the Staff in an SER dated February 9, 1993. Actual Nine Mile Point Unit 1 data was applied to verify reported results and assumptions.

The proposed setpoints for the IRM upscale (hi-hi), IRM upscale (rod block), IRM downscale, SRM upscale (rod block) have been defined as the nominal trip setpoint. The equipment design specification accuracy and drift tolerances were applied using the GE methodology (NEDC-31336) to determine the required Technical Specification setpoints. The surveillance test as found and as left data was evaluated to confirm that the equipment design specification accuracy and drift data bounded the actual test data.

Based on this analysis, the new maximum allowable Technical Specification setpoints (nominal trip setpoints) for the SRM upscale rod block is $\leq 9 \times 10^4$ counts per second, IRM upscale rod block is ≤[108/125] divisions of full scale, IRM upscale scram ≤[118/125] divisions of full scale and the IRM downscale rod block is ≥[7.75/125] divisions of full scale. These changes are required to be changed to be consistent with the 30 month surveillance interval (refuel cycle of 24 months +25 percent).

NUREG-1433, "Improved Standard Technical Specifications

At Nine Mile Point Unit 1 the Instrument Channel Test and Sensor Check are equivalent to the Channel Functional Test and Channel Check described in NUREG-1433, "Improved Standard Technical Specifications for BWR/4." The Improved Standard Technical Specifications associated with the channel functional test and channel check are proposed for Table 4.6.2a, "Instrumentation that Initiates Scram," (Surveillance Requirement) Items (9)(a)(i) and (9)(a)(ii), and Table 4.6.2g, "Instrumentation that Initiates Control Rod Withdrawal Block," (Surveillance Requirement) Items (1) and (2) including notes. For these items the new improved standard specifications are applicable to the IRM scram functions and SRM/IRM rod block function. The improved standard specifications for overlap surveillance has been adopted for the IRMs based on the improved overlap capabilities associated with IRM range 10. However, the SRM and IRM systems are not capable of achieving this overlap; in this case the overlap proposed is consistent with the systems capabilities. The NUREG-1433 standard for APRM upscale scram sensor check frequency (once per 12 hours) was also adopted consistent with that proposed for the IRM upscale scram.

CONCLUSION

The proposed changes expand the overlap between the IRM and APRM systems by expanding operation in the startup mode to include operation in IRM range 10 with range 10 calibrated to correspond with approximately 0 to 40 percent of rated neutron flux, delete the coincident IRM upscale/APRM downscale scram, extend the calibration frequency of the SRMs/IRMs to once a refueling cycle (24 months) and modify the SRM/IRM setpoints to be consistent with the proposed frequency.

The expansion of the startup operating range has been determined through power ascension testing to be required to achieve the optimal 1/2 decade overlap between the IRMs and the APRMs. Proper overlap improves plant safety by ensuring a smooth transition between the IRMs and APRMs and thereby simplifying plant operations. The evaluation of operation in IRM range 10 demonstrates that the addition of range 10 along with the RPS low pressure isolation activated ensures that the fuel cladding integrity safety limits would not be exceeded.

The increased IRM/APRM overlap effectively upgrades the Nine Mile Point Unit 1 overlap capabilities to be equivalent to BWR 4, 5 and 6's. This upgrade reduces the probability of multiple APRM channels downscale in the transition between the IRM and APRM systems and thus eliminates the need for re-activation of the IRM scram when in the run mode. The scram is replaced by an overlap surveillance which requires that the IRMs overlap by at least 1/2 decade with the APRMs during normal shutdown. This surveillance ensures that the IRM/APRM overlap is maintained, which is the basis for deletion of the APRM downscale scram. With the improved overlap, the probability of multiple APRM channels being downscale is reduced such that it is no longer a credible event and therefore, the APRM rod block in combination with proper operating procedures, provides the same level of protection.

In order to justify the new surveillance interval, the drift characteristics and setpoints associated with the SRM/IRM instrumentation were evaluated based on the General

Electric setpoint methodology documented in NEDC-31336. The methodology in NEDC-31336 accounts for inaccuracies, drift and calibration uncertainties and provides assurance that safety system actuation (i.e., reactor scram or control rod withdrawal block) will occur prior to the monitored parameter exceeding the analytical limit. Therefore, the 24 month interval combined with daily sensor checks, weekly instrument channel tests when required and the revised setpoints, will assure that system reliability and availability are maintained at their current levels.

For these reasons, there is reasonable assurance that the changes that would be authorized by the proposed amendment can be implemented without endangering the health and safety of the public and is consistent with common defense and security.

NO SIGNIFICANT HAZARDS CONSIDERATION ANALYSIS

10CFR50.91 requires that at the time a licensee requests an amendment, it must provide to the Commission its analysis using the standards in 10CFR50.92 concerning the issue of no significant hazards consideration. Therefore, in accordance with 10CFR50.91, the following analysis has been performed.

The operation of Nine Mile Point Unit 1, in accordance with the proposed amendment, will not involve a significant increase in the probability or consequences of an accident previously evaluated.

The proposed changes expand the IRM operating range, deletes the coincident APRM downscale scram trip and extend the calibration interval for the SRM/IRM System setpoints. The expansion of the startup operating range is required to achieve the 1/2 decade overlap between the IRMs and the APRMs. Proper overlap improves plant safety by ensuring a smooth transition between IRMs and APRMs. The evaluation of operation in IRM range 10 demonstrates that the addition of range 10 along with the RPS low pressure isolation activated ensures that the fuel cladding integrity safety limits would not be exceeded.

The increased IRM/APRM overlap reduces the probability of multiple APRM channels downscale in the transition between the IRM and APRM Systems and thus eliminates the need for re-activation of the IRM scram when in the run mode. The scram is replaced by an overlap surveillance which requires that the IRMs overlap by at least 1/2 decade with the APRMs during normal shutdown. This surveillance ensures that the IRM/APRM overlap is maintained which is the basis for deletion of the APRM downscale scram. With the improved overlap, the probability of multiple APRM channels being downscale is reduced such that it is no longer a credible event and therefore, the APRM rod block in combination with proper operating procedures, provides the same level of protection. Thus, normal plant operation is not affected by these changes and the probability of previously analyzed accidents is not increased.

The new surveillance intervals and setpoints were calculated using the General Electric approved methodology documented in NEDC-31336. The methodology in NEDC-31336 provides assurance that safety system actuation (i.e., reactor scram or control rod withdrawal block) will occur prior to the associated system parameter, neutron flux, from exceeding its analytical limit. Thus, plant response to previously analyzed accidents remains within previously determined limits.

Therefore, the operation of Nine Mile Point Unit 1, in accordance with the proposed amendment, will not involve a significant increase in the probability or consequences of an accident previously evaluated.

<u>The operation of Nine Mile Point Unit 1, in accordance with the proposed amendment, will not create the possibility of a new or different kind of accident from any accident previously evaluated.</u>

The addition of IRM range 10, deletion of the APRM downscale scram trip, and extension of the surveillance interval for the SRM/IRM instrumentation, does not involve an initiation or failure not considered in the Final Safety Analysis Report (Updated). The proposed changes do not alter the plant configuration and the initial conditions used for the design basis accident are still valid. Thus, no potential initiating events are created which would cause any new or different kinds of accidents. Therefore, operation of Nine Mile Point Unit 1 in accordance with the proposed amendment, will not create the possibility of a new or different kind of accident from any previously analyzed.

<u>The operation of Nine Mile Point Unit 1 in accordance with the proposed amendment, will not involve a significant reduction in a margin of safety.</u>

The addition of IRM range 10 ensures sufficient overlap with the APRM System such that switching between startup and run can be easily accomplished. The requirement for having the low reactor pressure isolation in effect when operating in IRM range 10 is to prevent a potential depressurization event. Analysis has shown that the margin between the existing safety limits and those events previously analyzed has not been reduced. The deletion of the coincident APRM scram trip has also been shown not to result in a decrease in the margin of safety as the APRM downscale control rod withdrawal block provides adequate protection. The analytical limits associated with the SRM/IRM instrumentation have been reconstituted in conjunction with extending the surveillance interval to once per operating cycle. The results using the methodology defined in NEDC-31336 required that various setpoints in the Technical Specifications be changed, however, these changes do not reduce the margins between any existing safety limits and previously analyzed events. Therefore, operation of Nine Mile Point Unit 1, in accordance with the proposed amendment, will not involve a significant reduction in a margin of safety.