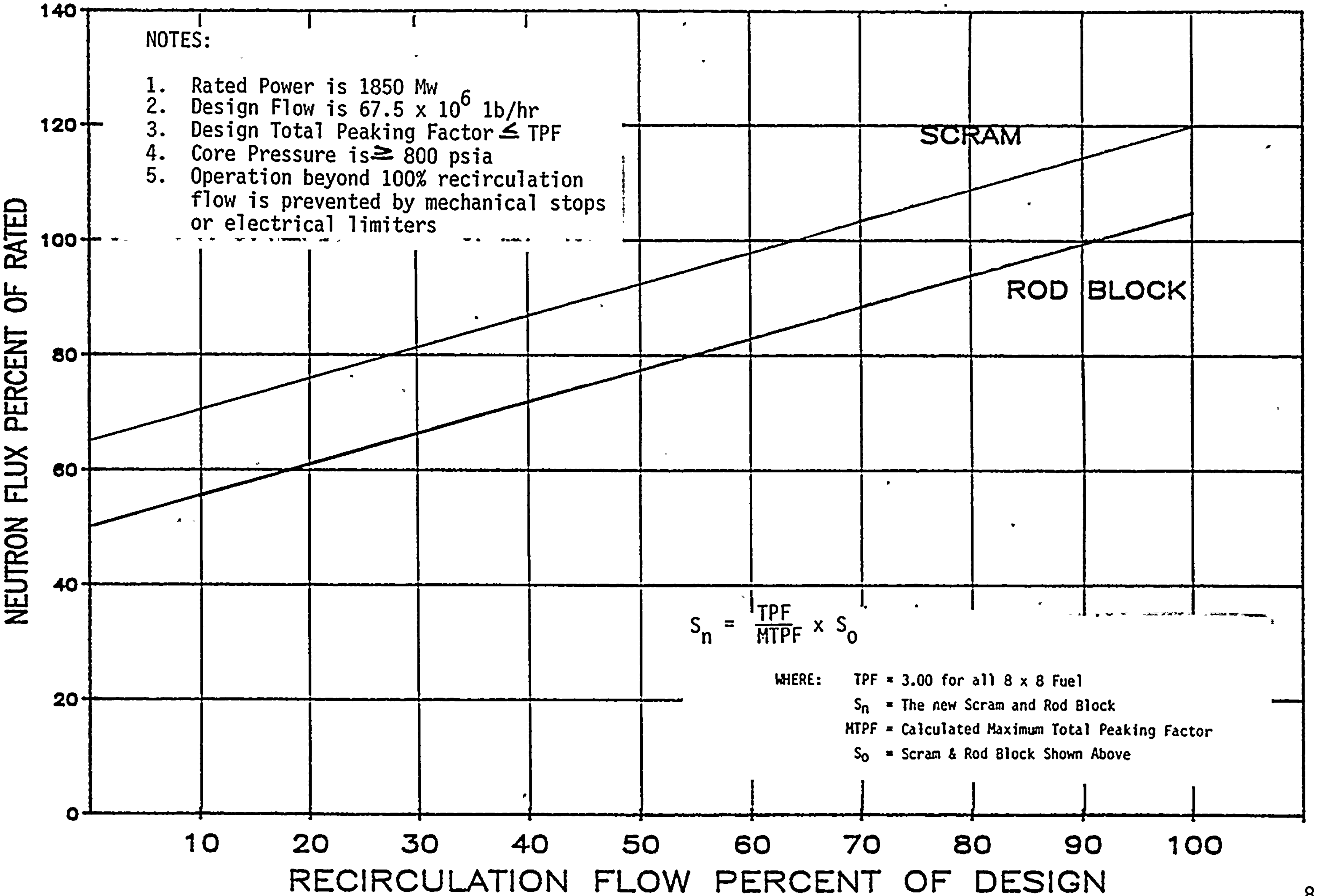
FIGURE 2.1.1
FLOW BIASED SCRAM AND APRM ROD BLOCK



NOTES:

1. Rated Power is 1850 Mw
2. Design Flow is 67.5×10^6 lb/hr
3. Design Total Peaking Factor $\leq$ TPF
4. Core Pressure is $\geq$ 800 psia
5. Operation beyond 100% recirculation flow is prevented by mechanical stops or electrical limiters

$$S_n = \frac{TPF}{MTPF} \times S_o$$

WHERE: TPF = 3.00 for all 8 x 8 Fuel
S_n = The new Scram and Rod Block
MTPF = Calculated Maximum Total Peaking Factor
S_o = Scram & Rod Block Shown Above

provide the basic input signals, the APRM system responds directly to average neutron flux. During transients, the instantaneous rate of heat transfer from the fuel (reactor thermal power) is less than the instantaneous neutron flux due to the time constant of the fuel. Therefore, during abnormal operational transients, the thermal power of the fuel will be less than that indicated by the neutron flux at the scram setting. Analyses (5,6,8,9,10,11,13) demonstrate that with a 120% scram trip setting, none of the abnormal operational transients analyzed violate the fuel safety limit and there is a substantial margin from fuel damage.

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. Mechanical stops or electrical limiters are installed on the recirculation controls to prevent operation beyond 100% recirculation flow conditions. The electrical limiter is utilized during end of cycle coastdown conditions. Administrative controls are used to assure that the electrical limiter is adjusted to limit recirculation flow to less than design rated flow (67.5×10^6 lb/hr) with tolerances of plus or minus 1%.

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 provide 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 MTPF and reactor core thermal power. The scram setting is adjusted in accordance with the formula in Figure 2.1.1 when the maximum total peaking factor is greater than the limiting total peaking factor.

b. Normal operation of the automatic recirculation pump control will be in excess of 30% rated flow; therefore, little operation below 30% flow is anticipated. For operation in the start-up mode while the reactor is at low pressure, the IRM scram setting is 12% of rated neutron flux. Although the operator will set the IRM scram trip at 12% of rated neutron flux or less, the actual scram setting can be as much as 2.5% of rated neutron flux greater. This includes the margins discussed above. This provides adequate margin between the setpoint and the safety limit at 25% of rated power. The margin is adequate to accommodate anticipated maneuvers associated with power 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

of the plant, a MCPR evaluation will be made at the 25% thermal power level with minimum recirculation pump speed. The MCPR margin will thus be demonstrated such that future MCPR evaluations below this power level will be shown to be unnecessary. The daily requirement for calculating MCPR above 25% rated thermal power is sufficient since power distribution shifts are very slow when there have not been significant power or control rod changes. The requirement for calculating MCPR when a limiting control rod pattern is approached ensures that MCPR will be known following a change in power or power shape (regardless of magnitude) that could place operation at a thermal limit.

Figure 3.1.7-1 is used for calculating MCPR during operation at other rated conditions. For the case of automatic flow control, the K_f factor is determined such that any automatic increase in power (due to flow control) will always result in arriving at the nominal required MCPR at 100% power. For manual flow control, the K_f is determined such that an inadvertent increase in core flow (i.e, operator error or recirculation pump speed controller failure) would result in arriving at the 99.9% limit MCPR when core flow reaches the maximum possible core flow corresponding to a particular setting of the recirculation pump MG set scoop tube maximum speed control limiting set screws. These screws are to be calibrated and set to a particular value and whenever the plant is operating in manual flow control the K_f defined by that setting of the screws is to be used in the determination of required MCPR. This will assure that the reduction in MCPR associated with an inadvertent flow increase always satisfies the 99.9% requirement. Irrespective of the scoop tube setting, the required MCPR is never allowed to be less than the nominal MCPR (i.e. K_f is never less than unity).

Power/Flow Relationship

The power/flow curve is the locus of critical power as a function of flow from which the occurrence of abnormal operating transients will yield results within defined plant safety limits. Each transient and postulated accident applicable to operation of the plant was analyzed along the power/flow line. The analysis (7, 8, 12, 14) justifies the operating envelope bounded by the power/flow curve as long as other operating limits are satisfied. Operation under the power/flow line is designed to enable the direct ascension to full power within the design basis for the plant. Mechanical stops or electrical limiters are installed on the recirculation controls to prevent operation beyond 100% recirculation flow conditions. The electrical limiter is used during end of cycle coastdown conditions. Administrative controls are used to assure that the electrical limiters are adjusted to limit recirculation flow to less than design rated flow (67.5×10^6 lb/hr) with tolerances of plus or minus 1%.

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)	--		X	X	
(b) APRM							
(i) Upscale	2	3(e)	Figure 2.1.1(n)		X	X	X
(ii) Inoperative	2	3(e)	--		X	X	X
(iii) Downscale	2	3(e)	≥ 5 percent of full scale		(g)	(g)	(g)
(10) Turbine Stop Valve Closure	2	4	≤ 10% valve closure				(i)
(11) Generator Load Rejection	2	2	(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	(f)	(f)	(f)
(ii) Inoperative	(f)	(f)	(f)
(b) APRM			
(i) Upscale	None	Once/week	Once/week
(ii) Inoperative	None	Once/week	Once/week
(iii) Downscale	None	Once/week	Once/week
(iv) 100% Flow	None	None	Once during each major refueling outage
(10) Turbine Stop Valve Closure	None	Once per 3 months	Once per operating cycle
(11) Generator Load Rejection	None	Once per month	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.

(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 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.

(f) Calibrate prior to starting 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 onscale. APRM downscale is bypassed when IRM's are onscale.

(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 test is not required if performed within the previous 92 days.

(n) Mechanical stops or electrical limiters are installed on the recirculation controls to prevent operation beyond 100% recirculation flow conditions. The electrical limiters are used during end of cycle coastdown conditions when core flow increases as core power decays. Administrative controls are used to assure that the electrical limiters are adjusted to limit recirculation flow to less than design rated flow (67.5×10^6 lb/hr) with tolerances of plus or minus 1%.

TABLE 4.6.2g (Cont'd)

INSTRUMENTATION THAT INITIATES CONTROL ROD WITHDRAWAL BLOCK

Surveillance Requirement

Parameter	Sensor Check	Instrument Channel Test	Instrument Channel Calibration
(3) APRM			
a. Inoperative	None	Once per month	Once per 3 months
b. Upscale (Biased by Recirculation Flow)	None	Once per month	Once per 3 months
c. Downscale	None	Once per month	Once per 3 months
d. 100% Flow	None	None	Once each refueling outage
(4) Recirculation Flow			
a. Comparator Off Normal	None	Once per month	Once per month
b. Flow Unit Inoperative	None	Once per month	Once per month
c. Flow Unit Upscale	None	Once per month	Once per month

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	Set Point	Reactor Mode Switch Position in Which Function Must Be Operable: Shutdown	Refuel	Startup	Run
c. Downscale	2	3 (b)	≥ 5 percent of full scale for each scale		X	X	
d. Upscale	2	3 (b)	≤ 88 percent of full scale for each scale		X	X	
(3) APRM							
a. Inoperative	2	3 (c)	--		X	X	X
b. Upscale (Biased by Recirculation Flow)	2	3 (c)	Figure 2.1.1(h)		X	X	X
c. Downscale	2	3 (c)	≥ 2 percent of full scale		(d)	(d)	X

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 APRM's 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 IRM's are onscale.

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

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

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

(h) Mechanical stops or electrical limiters are installed on the recirculation controls to prevent operation beyond 100% recirculation flow conditions. The electrical limiters are used during end of cycle coastdown conditions when core flow increases as core power decays. Administrative controls are used to assure that the electrical limiters are adjusted to limit recirculation flow to less than design rated flow (67.5×10^6 lb/hr) with tolerances of plus or minus 1%.

ATTACHMENT B

NIAGARA MOHAWK POWER CORPORATION

LICENSE NO. DPR-63

DOCKET NO. 50-220

Supporting Information and No Significant Hazards Consideration Analysis

The proposed Technical Specification amendment revises Figure 2.1.1 regarding the limiting relationships between core flow and core power. The proposed revision provides clarification that operation above 100% core flow is not permitted. Mechanical stops or electrical limiters enforce compliance with this requirement. Technical Specification Section 3.6.2, Tables 3.6.2a and g, and Tables 4.6.2a and g are revised to provide consistency with Figure 2.1.1 and to provide a surveillance requirement for calibration of the mechanical stops and electrical limiters once each major refueling outage. During end of cycle coastdown operation, when core flow tends to increase slightly due to changes in core differential pressure resulting from the power decrease, administrative controls are applied to reset the electrical limiter, thus ensuring that the design core flow (67.5×10^6 lbs/hr) is not exceeded. A one percent (1%) tolerance is permitted to allow for inaccuracies in the instrumentation.

10CFR50.91 requires that at the time a licensee requests an amendment, it must provide to the Commission its analysis, using the Standards in Section 50.92, about the issue of no significant hazards consideration. Therefore, in accordance with 10CFR50.91 and 10CFR50.92, 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.

None of the changes proposed affect the probability or consequences of an accident. The mechanical stops and electrical limiters assure that operation is restricted to the analyzed region of the power/flow curve.

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

This proposed change enforces operation within the analyzed region of the power/flow curve. The surveillance tests proposed incorporate normal plant practice into the Technical Specifications. No new or different kinds of accidents are created.

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

The proposed change does not reduce the margin of safety. The change assures that plant operation is kept within the analyzed limits of the power/flow curve, thus assuring that the safety margin is maintained.