ATTACHMENT A

NIAGARA MOHAWK POWER CORPORATION

LICENSE NO. DPR-63

DOCKET NO. 50-220

PROPOSED CHANGES TO THE TECHNICAL SPECIFICATIONS (APPENDIX A)

Replace pages 63, 64a, 64b, 64c, 70a, 70b, and 70c with the attached revised pages. Add pages 64d, 64e, and 70d. Pages 64b, 64c, 70b, and 70c have been retyped in their entirety with changes shown by the marginal markings.

LIMITING CONDITION FOR OPERATION

3.1.7 FUEL RODS

Applicability:

The Limiting Conditions for Operation associated with the fuel rods apply to those parameters which monitor the fuel rod operating conditions.

Objective:

The objective of the Limiting Conditions for Operation is to assure the performance of the fuel rods.

Specification:

a. Average Planar Linear Heat Generation Rate (APLHGR)

During power operation, the APLHGR for each type of fuel as a function of average planar exposure shall not exceed the limiting value shown in Figures 3.1.7a, 3.1.7b, and 3.1.7c. If at any time during power operation it is determined by normal surveillance that the limiting value for APLHGR is being exceeded at any node in the core, action shall be initiated within 15 minutes to restore operation to within the prescribed limits. If the APLHGR at all nodes in the core is not returned to within the prescribed limits within two (2) hours, reactor power reductions shall be initiated at a rate not less than 10% per hour until APLHGR at all nodes is within the prescribed limits.

Amendment No. 8, 16, 24, 31

SURVEILLANCE REQUIREMENT

4.1.7 FUEL RODS

Applicability:

The Surveillance Requirements apply to the parameters which monitor the fuel rod operating conditions.

Objective:

The objective of the Surveillance Requirements is to specify the type and frequency of surveillance to be applied to the fuel rods.

Specification:

a. Average Planar Linear Heat Generation Rate (APLHGR)

The APLHGR for each type of fuel as a function of average planar exposure shall be determined daily during reactor operation at ≥ 25% rated thermal power.

LIMITING CONDITION FOR OPERATION

c. Minimum Critical Power Ratio (MCPR)

During power operation MCPR shall be $\geq$ 1.40 for 8x8 fuel and $\geq$ 1.37 for 8x8R fuel at rated power and flow. If at any time during power operation it is determined by normal surveillance that these limits are no longer met, action shall be initiated within 15 minutes to restore operation to within the prescribed limits. If all the operating MCPRs are not returned to within the prescribed limits within two (2) hours, reactor power reductions shall be initiated at a rate not less than 10% per hour until MCPR is within the prescribed limits.

For core flows other than rated the MCPR limits shall be the limits identified above times K_f where K_f is as shown in Figure 3.1.7-1.

d. Power Flow Relationship During Power Operation

The power/flow relationship shall not exceed the limiting values shown in Figure 3.1.7.aa.

SURVEILLANCE REQUIREMENT

c. Minimum Critical Power Ratio (MCPR)

MCPR shall be determined daily during reactor power operation at >25% rated thermal power.

d. Power Flow Relationship

Compliance with the power flow relationship in Section 3.1.7.d shall be determined daily during reactor operation.

e. Partial Loop Operation

Under partial loop operation, surveillance requirements 4.1.7a, b, c, and d above are applicable.

LIMITING CONDITION FOR OPERATION	SURVEILLANCE REQUIREMENT
If at any time during power operation it is determined by normal surveillance that the limiting value for the power/flow relationship is being exceeded, action shall be initiated within 15 minutes to restore operation to within the prescribed limits. If the power/flow relationship is not returned to within the prescribed limits within two (2) hours, reactor power reductions shall be initiated at a rate not less than 10% per hour until the power/flow relationship is within the prescribed limits. e. <u>Partial Loop Operation</u> During power operation, partial loop operation is permitted provided the following conditions are met. When operating with three or more recirculation loops in operation and the remaining loops unisolated, the reactor may operate at 100 percent of full licensed power level in accordance with Figure 3.1.7aa. No reduction in the APLHGR for each fuel type is required. When operating with four recirculation loops in operation and one loop isolated, or with three recirculation loops in operation and one loop isolated and the remaining loop unisolated, the reactor may operate at 100 percent of full licensed power in accordance with Figure 3.1.7aa and an APLHGR not to exceed 98 percent of the limiting values shown in Figures 3.1.7a, 3.1.7b, and 3.1.7c, provided the following conditions are met for the isolated loop. 1. Suction valve, discharge valve and discharge bypass valve in the isolated loop shall be in the closed position and the associated motor breakers shall be locked in the open position.	

LIMITING CONDITION FOR OPERATION	SURVEILLANCE REQUIREMENT
2. Associated pump motor circuit breaker shall be opened and the breaker removed. If these conditions are not met, core power shall be restricted to 90.5 percent of full licensed power. When operating with three recirculation loops in operation and the two remaining loops isolated, the reactor may operate at 100 percent of full licensed power in accordance with Figure 3.1.7aa and an APLHGR not to exceed 96 percent of the limiting values shown in Figures 3.1.7a, 3.1.7b, and 3.1.7c, provided conditions 1 and 2 above are met for the isolated loops. If these conditions are not met, core power shall be restricted to 90.5 percent of full licensed power. Power operation is not permitted with less than three recirculation loops in operation. If at any time during power operation it is determined by normal surveillance that the limiting value for APLHGR under one and two isolated loop operation is being exceeded at any node in the core, action shall be initiated within 15 minutes to restore operation to within the prescribed limits. If the APLHGR at all nodes in the core is not returned to within the prescribed limits for one and two isolated loop operation within two (2) hours, reactor power reduction shall be initiated at a rate not less than 10 percent per hour until APLHGR at all nodes is within the prescribed limits.	

LIMITING CONDITION FOR OPERATION	SURVEILLANCE REQUIREMENT

f. Recirculation Loops

During all operating conditions with irradiated fuel in the reactor vessel, at least two (2) recirculation loop suction valves and their associated discharge valves will be in the full open position except when the reactor vessel is flooded to a level above the main steam nozzles or when the steam separators and dryer are removed.

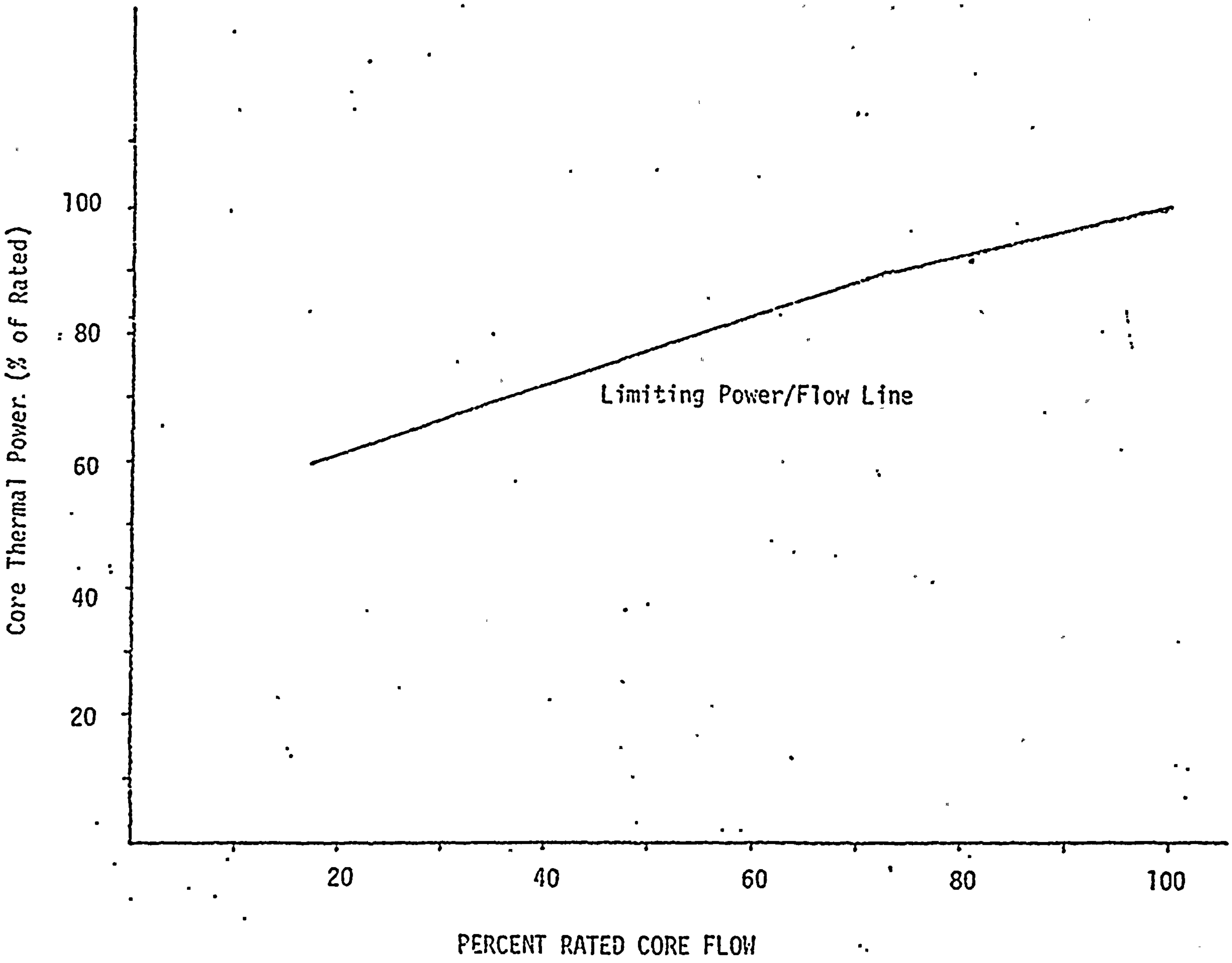
g. Reporting Requirements

If any of the limiting values identified in Specification 3.1.7.a, b, c, d, and e are exceeded, a Reportable Occurrence Report shall be submitted. If the corrective action is taken, as described, a thirty-day written report will meet the requirements of this Specification.

Figure 3.1.7.

NINE MILE POINT UNIT 1

LIMITING POWER FLOW LINE



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 than 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) 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.

Partial Loop Operation

The requirements of Specification 3.1.7e for partial loop operation in which the idle loop is isolated precludes the inadvertent startup of a recirculation pump with a cold leg. However, if these conditions cannot be met, power level is restricted to 90.5 percent power based on current transient analysis (Reference 9).

The results of the ECCS calculation are not affected by one or more recirculation loops being unisolated and out of service. This is due to the fact that no credit is taken for extended nucleate boiling caused by flow coastdown in the unbroken loops (Reference 10).

The results of the ECCS calculations are affected by one or more recirculation loops being isolated and out of service. The mass of water in the isolated loops unavailable during blowdown results in a slightly earlier uncovery time for the hot node. This results in an increase in the peak clad temperature. To assure peak clad temperatures remain below 2200 F during steady state power operation with one or two recirculation loops isolated, analysis has shown that the average linear heat generation rate for each fuel type shall be reduced 2 percent and 4 percent respectively.

Partial loop operation and its effect on lower plenum flow distribution is summarized in Reference 11. Since the lower plenum hydraulic design in a non-jet pump reactor is virtually identical to a jet pump reactor, application of these results is justified. Additionally, non-jet pump plants contain a cylindrical baffle plate which surrounds the guide tubes and distributes the impinging water jet and forces flow in a circumferential direction around the outside of the baffle.

Recirculation Loops

Requiring the suction and discharge for at least two (2) recirculation loops to be full open assures that an adequate flow path exists from the annular region between the pressure vessel wall and the core shroud, to the core region. This provides for communication between those areas thus assuring that reactor water level instrument readings are indicative of the water level in the core region.

When the reactor vessel is flooded to the level of the main steam line nozzle, communication between the core region and annulus exists above the core to ensure that indicative water level monitoring in the core region exists. When the steam separators and dryer are removed, safety limit 2.1.1d and e requires water level to be higher than 9 feet below minimum normal water level (Elevation 302'9"). This level is above the core shroud elevation which would ensure communication between the core region and annulus thus ensuring indicative water level monitoring in the core region. Therefore, maintaining a recirculation loop in the full open position in these two instances are not necessary to ensure indicative water level monitoring.

Reporting Requirements

The LCO's 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 LCO's was taken, a thirty-day written report is acceptable.

(1) "Fuel Densification Effects on General Electric Boiling Water Reactor Fuel," Supplements 6, 7 and 8, NEDM-10735, August 1973.

(2) Supplement 1 to Technical Report on Densifications of General Electric Reactor Fuels, December 14, 1974 (USA Regulatory Staff).

(3) Communication: V. A. Moore to I. S. Mitchell, "Modified GE Model for Fuel Densification," Docket 50-321, March 27, 1974.

(4) "General Electric Boiling Water Reactor Generic Reload Application for 8 x 8 Fuel," NEDO-20360, Supplement 1 to Revision 1, December 1974.

(5) "General Electric Company Analytical Model for Loss of Coolant Analysis in Accordance with 10CFR50 Appendix K," NEDO-20566.

(6) General Electric Refill Reflood Calculation (Supplement to SAFE Code Description) transmitted to the USAEC by letter, G. L. Gyorey to Victor Stello Jr., dated December 20, 1974.

(7) "Nine Mile Point Nuclear Power Station Unit 1, Load Line Limit Analysis," NEDO-24012.

(8) Licensing Topical Report General Electric Boiling Water Reactor Generic Reload Fuel Application, NEDE-24011-P-A, August, 1978.

(9) Final Safety Analysis Report, Nine Mile Point Nuclear Station, Niagara Mohawk Power Corporation, June 1967.

(10) NRC Safety Evaluation, Amendment No. 24 to DPR-63 contained in a letter from George Lear, NRC, to D. P. Dise dated May 15, 1978.

(11) "Core Flow Distribution in a General Electric Boiling Water Reactor as Measured in Quad Cities Unit 1," NEDO-10722A.

ATTACHMENT B

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SUPPORTING INFORMATION

Attachment A describes proposed changes to the Nine Mile Point Unit 1 Technical Specifications. These changes clarify allowable power operation conditions with three or more recirculation loops in operation and the inoperable loops either isolated, unisolated, or a combination thereof.

For one or two loops out of service but not isolated, the core flow and fluid inventory distribution in the core are the same as would be present with all loops in service. Therefore, there would be no affect on the Emergency Core Cooling System (ECCS) calculation due to the out-of-service loop(s). This is due to the fact that no credit is taken for extended nucleate boiling caused by flow coastdown in the unbroken loops. Therefore, operation at the full Maximum Average Planar Linear Heat Generation Rate (MAPLHGR) limits is acceptable with one or two loops out of service but not isolated. Also, transient analyses do not change since operation will be within the allowable power/flow line. Idle loop startup transient is not applicable since a cold leg will not be present if the loop is not isolated.

For four loop operation with the idle loop isolated, the previous accident analyses for five loop operation are bounding except for the Loss Of Coolant Accident (LOCA). The mass of water in the isolated loop unavailable during blowdown results in a slightly earlier uncovery time for the hot node. This results in an increase in the peak clad temperature of approximately 30 F, which is approximately equivalent to a 1.5 percent reduction in MAPLHGR. To assure that the peak clad temperature remains below the 2200 F Appendix K limit during steady state power operation with one recirculation line isolated, the Average Linear Heat Generation Rate (LHGR) for each fuel type as a function of average planar exposure shall not exceed 98 percent of the MAPLHGR applicable to five pump operation.

For three loop operation with one loop isolated and one loop unisolated, previous analyses for four loop operation with one loop isolated is bounding since loops out of service but unisolated have no effect on ECCS calculation or transient analyses.

For three loop operation with two idle loops isolated, further increases in peak clad temperature would result during a postulated LOCA since an additional mass of water is unavailable during blowdown due to the second isolated loop. During a postulated LOCA, a second isolated loop would result in a further increase in the peak clad temperature and requires an additional 2 percent reduction in MAPLHGR. To assure that the peak clad temperature remains below the 2200 F Appendix K limit during steady state power operation with two recirculation lines isolated, the average LHGR for each fuel type as a function of average planar exposure shall not exceed 96 percent of the MAPLHGR applied to five pump operation.

Previous analyses (Reference 1) have demonstrated that the pump seizure accident is not as severe as a LOCA for five pump operation. Previous core-wide transient analyses for five loop operation are bounding for four loop and three loop operation with the idle loops isolated, except for the idle loop startup transient analysis (Reference 2). To preclude idle loop startup, Niagara Mohawk will use procedural controls identical to those currently utilized for four loop operation with the idle loop isolated. These requirements for idle loop operation preclude the inadvertent startup of recirculation pumps and therefore remove the need for a power level restriction under partial loop operation. If these administrative procedures are removed, power level shall be restricted to 90.5 percent of rated. This is the power level for which an inadvertent startup of an idle loop has been analyzed and found acceptable.

Partial loop operation and its effect on lower plenum flow distribution is summarized in Reference 3. Since the lower plenum hydraulic design in a non-jet pump reactor is virtually identical to a jet pump reactor, application of these results is justified. Additionally, non-jet pump plants contain a cylindrical baffle plate which surrounds the guide tubes and distributes the impinging water jets and forces flow in a circumferential direction around the outside of the baffle.

References

1. Safety Evaluation contained in a letter from G. Lear, NRC, to D. P. Dise, NMPC, dated May 15, 1978.

2. Application for Amendment to Operating License from D. P. Dise to NRC dated July 18, 1979.

3. "Core Flow Distribution in a General Electric Boiling Water Reactor as Measured in Quad Cities Unit 1" NEDO 10722A.

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