

UNITED STATES NUCLEAR REGULATORY COMMISSION WASHINGTON, D. C. 20555

# NIAGARA · MOHAWK · POWER · CORPORATION

# DOCKET NO. 50-410

# NINE-MILE POINT NUCLEAR STATION, UNIT 2

# AMENDMENT TO - FACILITY . OPERATING . LICENSE

Amendment No. 21 License No. NPF-69

- 1. The Nuclear Regulatory Commission (the Commission) has found that:
  - The application for amendment by Niagara Mohawk Power Corporation Α. (the licensee) dated October 5, 1989, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's rules and regulations set forth in 10 CFR Chapter I:
  - Β. The facility will operate in conformity with the application. the provisions of the Act, and the rules and regulations of the Commission:
  - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
  - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
  - Ε. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.
- 2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. NPF-69 is hereby amended to read as follows:

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# (2) <u>Technical Specifications.and Environmental</u>.Protection.Plan

The Technical Specifications contained in Appendix A and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto, as revised through Amendment No. 21 are hereby incorporated into this license. Niagara Mohawk Power Corporation shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of the date of its issuance to be implemented within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION

Robert a. Cap

Robert A. Capra, Director Project Directorate I-1 Division of Reactor Projects - I/II Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications

Date of Issuance: August 17, 1990

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# ATTACHMENT TO LICENSE AMENDMENT

# AMENDMENT NO. 21 TO FACILITY OPERATING LICENSE NO. NPF-69

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# Revise Appendix A as follows:

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<u>TABLE 3.3.6-1</u>

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# CONTROL ROD BLOCK INSTRUMENTATION

TRIP FUNCTION	MINIMUM OPERABLE CHANNELS <u>PER TRIP FUNCTION</u>	APPLICABLE OPERATIONAL CONDITIONS	<u>ACTION</u>
<pre>1. <u>Rod Block Monitor(a)</u> a. Upscale b. Inoperative c. Downscale</pre>	2 2 2	1* . 1* 1*	60 60 60
2. <u>APRM</u> a. Flow-Biased Neutron Flux-Upscale b. Inoperative c. Downscale d. Neutron Flux-Upscale, Startup	4 4 4 4	1 1, 2, 5 1 2, 5	61 61 61 61
3. <u>Source Range Monitor</u> a. Detector Not Full In (b)	) 3 2	2 5	61 61
b. Upscale(c)	32.	2 5	61 61
c. Inoperative(c)	3 2	2 5	61 61
d. Downscale(d)	3 2(f)	2 5	61 61
<ul> <li><u>Intermediate Range Monitor</u></li> <li>a. Detector Not Full In</li> <li>b. Upscale</li> <li>c. Inoperative</li> <li>d. Downscale(e)</li> </ul>	6 6 6 6	2, 5 2, 5 2, 5 2, 5 2, 5	61 61 61 61
5. <u>Scram Discharge Volume</u> Water Level - High, Float Switch	2	1, 2, 5**	62
6. <u>Reactor Coolant System</u> <u>Recirculation Flow</u> a. Upscale b. Inoperative c. Comparator	2 2 2	1 1 1	62 62 62
7. <u>Reactor Mode Switch</u> a. Shutdown Mode b. Refuel Mode	2 2	3, 4 5	62 62

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#### TABLE 3.3.6-1 (Continued)

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## CONTROL ROD BLOCK INSTRUMENTATION

#### TABLE NOTATIONS

- \* With THERMAL POWER greater than or equal to 30% of RATED THERMAL POWER.
- \*\* With more than one control rod withdrawn. Not applicable to control rods removed per Specification 3.9.10.1 or 3.9.10.2.
- (a) The RBM shall be automatically bypassed when a peripheral control rod is selected.
- (b) This function shall be automatically bypassed if detector count rate is greater than 100 cps or the IRM channels are on range 3 or higher.
- (c) This function shall be automatically bypassed when the associated IRM channels are on range 8 or higher.
- (d) This function shall be automatically bypassed when the IRM channels are on range 3 or higher.
- (e) This function shall be automatically bypassed when the IRM channels are on range 1.
- (f) During complete core spiral offloading and reloading, an SRM downscale rod block instrumentation channel is not required to be OPERABLE when the associated SRM channel is downscale.

#### ACTION

- ACTION 60 Declare the RBM inoperable and take the ACTION required by Specification 3.1.4.3.
- ACTION 61 With the number of OPERABLE Channels:
  - a. One less than required by the Minimum OPERABLE Channels per Trip Function requirement, restore the inoperable channel to OPERABLE status within 7 days or place the inoperable channel in the tripped condition within the next hour.
  - b. Two or more less than required by the Minimum OPERABLE Channels per Trip Function requirement, place at least one inoperable channel in the tripped condition within 1 hour.
- ACTION 62 With the number of OPERABLE channels less than required by the Minimum OPERABLE Channels per Trip Function requirement, place the inoperable channel in the tripped condition within 1 hour.

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\* · i i Participante de la construcción de la const 

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# Table 3.3.6-2 (Continued)

# CONTROL ROD BLOCK INSTRUMENTATION SETPOINTS

TRIP FUNCTION	TRIP SETPOINT	ALLOWABLE VALUE
6. <u>Reactor Coolant System Rec</u>	rculation Flow_	
a. Upscale b. Inoperative c. Comparator	<u>&lt;</u> 108% rated flow NA <u>&lt;</u> 10% flow deviation	<pre>&lt;111% rated flow NA </pre>
7. <u>Reactor Mode Switch</u>		
a. Shutdown Mode b. Refuel Mode .	NA NA	NA . NA

# Specified in the CORE OPERATING LIMITS REPORT

\*\* For fuel loading and startup from refueling the count rate may be less than 3 cps if the following conditions are met: the signal to noise ratio is greater than or equal to 5, and the signal is greater than 1.3 cps.

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INSTRUMENTATION

MONITORING INSTRUMENTATION

SOURCE RANGE MONITORS

# SURVEILLANCE\_REQUIREMENTS\_

- 4.3.7.6 (Continued)
- c. Verifying, before withdrawal of control rods, that the SRM count rate is at least 3 cps\* with the detector fully inserted.

\*For fuel loading and startup from refueling the count rate may be less than 3 cps if the following conditions are met: (1) the signal-to-noise ratio is greater than or equal to 5 and (2) the signal is greater than 1.3 cps.

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# -REFUELING OPERATIONS

3/4.9.2 INSTRUMENTATION

### LIMITING CONDITIONS FOR OPERATION

3.9.2 At least 2 source range monitor\* (SRM) channels shall be OPERABLE and inserted to the normal operating level with:

- a. Continuous visual indication of the required count rate in the control room,\*\*
- b. Audible indication in the control room,
- c. One of the required SRM detectors located in the quadrant where CORE ALTERATIONS are being performed and the other required SRM detector located in an adjacent quadrant, and
- d. Unless adequate shutdown margin has been demonstrated per Specification 3.1.1 and the "one rod out" interlock is OPERABLE per Specification 3.9.1, the shorting links shall be removed from the RPS circuitry prior to and any time one control rod is withdrawn.\*\*\*

APPLICABILITY: OPERATIONAL CONDITION 5.

#### ACTION:

With the requirements of the above specification not satisfied, immediately suspend all operations involving CORE ALTERATIONS and insert all insertable control rods.

#### SURVEILLANCE REQUIREMENTS

4.9.2 Each of the above required SRM channels shall be demonstrated OPERABLE by:

- a. At least once per 12 hours:
  - 1. Performing a CHANNEL CHECK,
  - 2. Verifying the detectors are inserted to the normal operating level, and
  - 3. During CORE ALTERATIONS, verifying that the detector of an OPERABLE SRM channel is located in the core quadrant where CORE ALTERATIONS are being performed and another is located in an adjacent quadrant.

\*\*\* Not required for control rods removed per Specification 3.9.10.1 and 3.9.10.2.

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<sup>\*</sup> The use of special movable detectors during CORE ALTERATIONS in place of the normal SRM nuclear detectors is permissible as long as these special detectors are connected to the normal SRM circuits.

<sup>\*\*</sup> During complete core spiral offload and reload, only one of the required SRM channels must have continuous visual indication in the control room. No visual indication is required until after the first four fuel bundles have been placed in the core, and no visual indication is required when all but four bundles have been removed from the core.

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# REFUELING OPERATIONS

# INSTRUMENTATION

# SURVEILLANCE REQUIREMENTS

# 4.9.2 (Continued)

- b. Performing a CHANNEL FUNCTIONAL TEST:
  - 1. Within 24 hours before the start of CORE ALTERATIONS, and
  - 2. At least once per 7 days.
- c. Verifying that the channel count rate is at least 3 cps\*
  - 1. Before control rod withdrawal,
  - 2. Before and at least once per 12 hours during CORE ALTERATIONS, and
  - 3. At least once per 24 hours,

# Except that:

- 1. During complete core spiral offloading, the SRM count rate need not be maintained when the fuel assemblies around the SRM are removed.
- 2. Prior to and during complete core spiral reloading, the required count rate may be achieved by:
  - a) Use of a portable external source, or
  - b) Loading up to 4 fuel assemblies in cells containing inserted control rods around an SRM.
- d. Verifying, within 8 hours before and at least once per 12 hours during the time any control rod is withdrawn that the shorting links have been removed from the RPS circuitry, unless adequate shutdown margin has been demonstrated per Specification 3.1.1 and the "one rod out" interlock is OPERABLE per Specification 3.9.1.

<sup>\*</sup> The count rate may be less than 3 cps if the following conditions are met: (1) the signal-to-noise ratio is greater than or equal to 5, and (2) the signal is greater than 1.3 cps.

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**REFUELING OPERATIONS** 

CONTROL ROD REMOVAL

#### MULTIPLE CONTROL ROD REMOVAL

#### LIMITING CONDITIONS FOR OPERATION

3.9.10.2 Any number of control rods and/or control rod drive mechanisms may be removed from the core and/or reactor pressure vessel provided that at least the following requirements are satisfied until all control rods and control rod drive mechanisms are reinstalled and all control rods are inserted in the core.

- a. The reactor mode switch is OPERABLE and locked in the Shutdown position or in the Refuel position per Specification 3.9.1, except that the Refuel position "one-rod-out" interlock may be bypassed, as required, for those control rods and/or control rod drive mechanisms to be removed, after the fuel assemblies have been removed as specified below.
- b. The source range monitors (SRMs) are OPERABLE per Specification 3.9.2.
- c. The SHUTDOWN MARGIN requirements of Specification 3.1.1 are satisfied.
- d. All other control rods are either inserted or have the surrounding four fuel assemblies removed from the core cell.
- e. The four fuel assemblies surrounding each control rod or control rod drive mechanism to be removed from the core and/or reactor vessel are removed from the core cell.

f. All fuel loading operations have been suspended.\*

APPLICABILITY: OPERATIONAL CONDITION 5.

#### ACTION:

With the requirements of the above specification not satisfied, suspend removal of control rods and/or control rod drive mechanisms from the core and/or reactor pressure vessel and initiate action to satisfy the above requirements.

Except during complete core spiral reload where the shorting links shall be removed and dedicated procedures shall be strictly followed.

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REFUELING OPERATIONS

CONTROL ROD REMOVAL

MULTIPLE CONTROL ROD REMOVAL

# SURVEILLANCE REOUIREMENTS

4.9.10.2.1 Within 4 hours before the start of removal of control rods and/or control rod drive mechanisms from the core and/or reactor pressure vessel and at least once per 24 hours thereafter until all control rods and control rod drive mechanisms are reinstalled and all control rods are inserted in the core, verify that:

- a. The reactor mode switch is OPERABLE per Surveillance Requirement 4.3.1.1 or 4.9.1.2, as applicable, and locked in the Shutdown position or in the Refuel position per Specification 3.9.1
- b. The SRM channels are OPERABLE per Specification 3.9.2
- c. The SHUTDOWN MARGIN requirements of Specification 3.1.1 are satisfied.
- d. All other control rods are either inserted or have the surrounding four fuel assemblies removed from the core cell. .
- e. The four fuel assemblies surrounding each control rod and/or control rod drive mechanism to be removed from the core and/or reactor vessel are removed from the core cell.
- f. All fuel loading operations have been suspended.\*

4.9.10.2.2 Following replacement of all control rods and/or control rod drive mechanisms removed in accordance with this specification, perform a functional test of the "one-rod-out" Refuel position interlock, if this function had been bypassed.

Except during complete core spiral reload where the shorting links shall be removed and dedicated procedures shall be strictly followed.

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# 3/4.9 REFUELING OPERATIONS

#### BASES

# 3/4.9.1 REACTOR MODE SWITCH

Locking the OPERABLE reactor mode switch in the Shutdown or Refuel position, as specified, ensures that the restrictions on control rod withdrawal and refueling platform movement during the refueling operations are properly activated. These conditions reinforce the refueling procedures and reduce the probability of inadvertent criticality, damage to reactor internals or fuel assemblies, and exposure of personnel to excessive radioactivity.

#### 3/4.9.2 INSTRUMENTATION

The OPERABILITY of at least two source range monitors ensures that redundant monitoring capability is available to detect changes in the reactivity condition of the core. The SRM's are provided to monitor the core during periods of station shutdown and to guide the operator during refueling operations and station startup. Requiring two operable SRM's, one in and one adjacent to any core quadrant where fuel or control rods are being moved, assures adequate monitoring of that quadrant during such alterations. The requirement of 3 counts per second provides assurance that neutron flux is being monitored.

A spiral unloading pattern is one by which the fuel in the outermost cells (four fuel bundles surrounding a control blade) is removed first. Unloading continues by removing the remaining outermost fuel by cell. The last cell removed will be adjacent to an SRM. Spiral reloading is the reverse of unloading. Spiral unloading and reloading will preclude the creation of flux traps (moderator filled or partially filled cells surrounded on all sides by fuel).

During spiral unloading, the SRM's shall have an initial count rate of at least 3 cps with all rods fully inserted. It is expected that the count rate of the SRM's will drop below 3 cps before all of the fuel is unloaded. Since there will be no reactivity additions, a lower number of counts will not present a hazard. When all of the fuel has been removed to the spent fuel storage pool, the SRM's will no longer be required. Requiring an SRM to be operational prior to fuel removal from around that SRM assures that the SRM's are OPERABLE and can be relied upon when the count rate goes below the required minimum.

During spiral reload, SRM operability will be verified by using a portable external source once every 12 hours until the required amount of fuel is loaded to maintain 3 cps. As an alternative to the above, four fuel assemblies will be loaded in cells containing control blades around one SRM to obtain the required count rate. The loading of up to four bundles around the SRMs before attaining the required count rate is permissible because analysis has shown that an array of four fuel bundles in any configuration will remain subcritical. Until these four assemblies have been loaded, the 3 cps (or 1.3 cps) requirement is not necessary.

# 3/4.9.3 CONTROL ROD POSITION

The requirement that all control rods be inserted during other CORE ALTERATIONS ensures that fuel will not be loaded into a cell without a control rod.

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### 3/4.9 REFUELING OPERATIONS

#### BASES

#### 3/4.9.4 DECAY TIME

The minimum requirement for reactor subcriticality before fuel movement ensures that sufficient time has elapsed to allow the radioactive decay of the shortlived fission products. This decay time is consistent with the assumptions used in the accident analyses.

#### 3/4.9.5 COMMUNICATIONS .

The requirement for communications capability ensures that refueling station personnel can be promptly informed of significant changes in the facility status or core reactivity condition during movement of fuel within the reactor pressure vessel.

#### 3/4.9.6 REFUELING PLATFORM

The OPERABILITY requirements ensure that (1) the refueling platform will be used for handling control rods and fuel assemblies within the reactor pressure vessel, (2) each crane and hoist has sufficient load capacity for handling fuel assemblies and control rods, and (3) the core internals and pressure vessel are protected from excessive lifting force in the event they are inadvertently engaged during lifting operations.

### 3/4.9.7 CRANE TRAVEL - SPENT FUEL STORAGE POOL

The restriction on movement of loads in excess of the nominal weight of a fuel assembly over other fuel assemblies in the storage pool ensures that in the event this load is dropped (1) the activity release will be limited to that contained in a single fuel assembly and (2) any possible distortion of fuel in the storage racks will not result in a critical array. This assumption is consistent with the activity release assumed in the safety analyses.

# 3/4.9.8 & 3/4.9.9 WATER LEVEL - REACTOR VESSEL AND WATER LEVEL - SPENT FUEL STORAGE POOL

The restrictions on minimum water level ensure that sufficient water depth is available to remove 99% of the assumed 10% iodine gap activity released from the rupture of an irradiated fuel assembly. This minimum water depth is consistent with the assumptions of the accident analysis.

#### 3/4.9.10 CONTROL ROD REMOVAL

These specifications ensure that maintenance or repair of control rods or control rod drives will be performed under conditions that limit the probability of inadvertent criticality. The requirements for simultaneous removal of more than one control rod are more stringent since the SHUTDOWN MARGIN specification provides for the core to remain subcritical with only one control rod fully withdrawn.

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# 3/4.9 REFUELING OPERATIONS

#### BASES

## 3/4.9.10 CONTROL ROD REMOVAL (Continued)

This specification also permits the unloading of a significant portion of the reactor core for such purposes as removal of temporary control curtains, control rod drive maintenance, in-service inspection requirements, examination of the core support plate, etc. When the refueling interlock input signal from a withdrawn control rod is bypassed, administrative controls will be in effect to prohibit fuel from being loaded into that control cell.

These operations are performed with the mode switch in the "Refuel" position to provide the refueling interlocks normally available during refueling. In order to withdraw more than one control rod, it is necessary to bypass the refueling interlock on each withdrawn control rod. The requirement that the fuel assemblies in the cell controlled by a control rod be removed from the reactor core before the interlock can be bypassed insures that withdrawal of another control rod does not result in inadvertent criticality. Following the withdrawal of a rod from an empty cell, a second licensed operator will independently verify that the interlock bypassed is on the correct control rod. Once the control rod is withdrawn, it will be valved out of service. Each control rod essentially provides reactivity control for the fuel assemblies in the cell associated with the control rod. Thus, offloading the core results in a continuous reduction of core reactivity.

#### 3/4.9.11 RESIDUAL HEAT REMOVAL AND COOLANT CIRCULATION

The requirement that at least one residual heat removal loop be OPERABLE or that an alternate method capable of decay heat removal be demonstrated and that an alternate method of coolant mixing be in operation ensures that (1) sufficient cooling capacity is available to remove decay heat and maintain the water in the reactor pressure vessel below 140°F as required during REFUELING and (2) sufficient coolant circulation would be available through the reactor core to assure accurate temperature indication and to distribute and prevent stratification of the poison in the event it becomes necessary to actuate the standby liguid control system.

The requirement to have two shutdown cooling mode loops OPERABLE when there is less than 22 feet 3 inches of water above the reactor vessel flange ensures that a single failure of the operating loop will not result in a complete loss of residual heat removal capability. With the reactor vessel head removed and 22 feet 3 inches of water above the reactor vessel flange, a large heat sink is available for core cooling. Thus, in the event of a failure of the operating RHR loop, adequate time is provided to initiate alternate methods capable of decay heat removal or emergency procedures to cool the core.

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# 3/4.10 SPECIAL TEST EXCEPTIONS

## BASES\_

## 3/4.10.1 PRIMARY CONTAINMENT INTEGRITY

The requirement for PRIMARY CONTAINMENT INTEGRITY is not applicable during the period when open vessel tests are being performed during the low-power PHYSICS TESTS.

#### 3/4.10.2 ROD SEQUENCE CONTROL SYSTEM

In order to perform the tests required in the Technical Specifications it is necessary to bypass the sequence restraints on control rod movement. The additional surveillance requirements ensure that the specifications on heat generation rates and shutdown margin requirements are not exceeded during the period when these tests are being performed and that individual rod worths do not exceed the values assumed in the safety analysis.

#### 3/4.10.3 SHUTDOWN MARGIN DEMONSTRATIONS

Performance of shutdown margin demonstrations with the vessel head removed requires additional restrictions in order to ensure that criticality does not occur. These additional restrictions are specified in this Limiting Condition for Operation.

# 3/4.10.4 RECIRCULATION LOOPS

This special test exception permits reactor criticality under no-flow conditions and is required to perform certain startup and PHYSICS TESTS while at low THERMAL POWER levels.

# 3/4.10.5 OXYGEN CONCENTRATION

Relief from the oxygen concentration specifications is necessary in order to provide access to the primary containment during the initial startup and testing phase of operation. Without this access, the startup and test program could be restricted and delayed.

#### 3/4.10.6 TRAINING STARTUPS

This special test exception permits training startups to be performed with the reactor vessel depressurized at low THERMAL POWER and temperature while controlling RCS temperature with one RHR subsystem aligned in the shutdown cooling mode in order to minimize the discharge of contaminated water to the radioactive waste disposal system.

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