



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 70 TO FACILITY OPERATING LICENSE NO. NPF-69

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT NUCLEAR STATION, UNIT 2

DOCKET NO. 50-410

1.0 INTRODUCTION

By letter dated January 16, 1995, as supplemented April 18, 1995, the Niagara Mohawk Power Corporation (the licensee) submitted a request for changes to the Nine Mile Point Nuclear Station, Unit 2, (NMP-2) Technical Specifications (TSs). The requested changes would revise TS Sections 3.8.1.1 and 3.8.1.2; TS Surveillance Requirements Section 4.8.1.1.2; TS Bases Section 3/4.8.1.3; and TS Administrative Controls Section 6.8.4. Specifically TS 3/4.8.1, "AC Sources-Operating," and 3/4.8.1.2, "AC Sources-Shutdown," would be revised to (1) change the minimum quantity of fuel oil required in the day tanks and the storage tanks, (2) add specific actions to be taken if the storage tank levels fall below minimum requirements, (3) relocate to the associated Bases the fuel oil sampling and testing criteria, and (4) add specific actions to be taken if the fuel oil properties do not meet specified limits. The changes would also revise TS 6.8.4, "Programs", to add a requirement for diesel fuel oil testing program. The April 18, 1995, letter provided clarifying information that did not change the initial no proposed significant hazards consideration.

2.0 BACKGROUND

A sufficient supply of fuel oil is required for 7 days of operation for each emergency diesel generator (EDG) at NMP-2. Certain circumstances (e.g., full load operation required after an inadvertent start while at minimum required levels; or feed and bleed operations that may be necessary to correct particulate levels or other oil quality degradations) may cause EDG fuel oil level(s) to drop below the specified minimum of 7-day fuel oil supply. Current NMP-2 TSs require the EDG(s) to be declared inoperable if fuel oil supplies fall below the specified minimums for any reason. However, the Improved Standard TSs (STSS) (NUREG-1434) allow time to restore the fuel level(s) to the required minimums without declaring the associated EDG(s) inoperable. Similarly, the EDG(s) must be declared inoperable if the fuel oil sample test results fall outside the limits specified in the Surveillance Requirements.

The licensing basis for the plant, as described in the TSs, requires testing of the quality of diesel fuel oil stored onsite. The tests should be performed before new oil is introduced into the storage tanks and periodically on the stored oil. The purpose of the tests is to assure that oil meets specifications which ensure proper operation of the EDGs. An important test

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is for water, sediment or particulate content. Water in diesel fuel oils can lead to corrosion of carbon steel components, and seriously affect efficiency of combustion of fuel oil in the diesel engine. High levels of sediment and particulate in diesel oil can block fuel oil filters and lead to degradation of performance of the EDGs. Before addition of fuel oil to the storage tank it is sampled in accordance with ASTM D4057-81 and tested in accordance with ASTM D975-81. Testing of the stored fuel on-site is done at least once every 31 days, in accordance with ASTM D2276-78. The licensee is required by their TS to declare any diesel generator inoperable if fuel oil properties or total particulate cannot be restored to within required limits in prescribed time intervals.

3.0 EVALUATION

3.1 TS Sections 3.8.1.1 and 3.8.1.2 - Limiting Condition for Operation

The licensee proposed changes to TS Section 3.8.1.1, "AC Sources - Operating", and TS Section 3.8.1.2, "AC Sources - Shutdown" - Limiting Conditions for Operation. Existing TS Sections 3.8.1.1 and 3.8.1.2, in part, require that:

- a. Separate day fuel tanks containing a minimum of 409 gallons of fuel for EDG*1 (Division I) and EDG*3 (Division II), and 282 gallons for EDG*2 (HPCS-Division III),
- b. A separate fuel storage system containing a minimum of 52,664 gallons of fuel for EDG*1 (Division I) and EDG*3 (Division II), and 36,173 gallons for EDG*2 (HPCS-Division III).

The licensee proposed to revise the above existing requirements to reflect the updated minimum fuel oil supplies required in the day tanks and the storage tanks as follow:

- a. Separate day fuel tanks containing a minimum of 403 gallons of fuel for EDG*1 (Division I) and EDG*3 (Division II), and 282 gallons for EDG*2 (HPCS-Division III),
- b. A separate fuel storage system containing a minimum of 47,547 gallons of fuel for EDG*1 (Division I) and EDG*3 (Division II), and 35,342 gallons for EDG*2 (HPCS-Division III).

The licensee revised EDG fuel oil consumption calculations using the time-dependent loads during design basis events to determine the minimum fuel oil supply required for 7 days of operation for each EDG. Based on our review of the licensee's calculations, we conclude that there is sufficient supply of fuel oil for 7 days of operation for each EDG at NMP-2. Therefore, we find the above proposed changes to TS Sections 3.8.1.1 and 3.8.1.2 acceptable.

3.2 TS Sections 3.8.1.1 and 3.8.1.2 - Action Statement

The proposed change would add the following to the action statements of TS



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3/4.8 ELECTRICAL POWER SYSTEMS

3/4.8.1 AC SOURCES

AC SOURCES - OPERATING

LIMITING CONDITIONS FOR OPERATION

3.8.1.1 As a minimum, the following AC electrical power sources shall be OPERABLE:

- a. Two physically independent circuits between the offsite transmission network and the onsite Class 1E distribution system, and
- b. Three separate and independent diesel generators, each with:
 1. Separate day fuel tanks containing a minimum of 403 gallons of fuel for EDG*1 (Division I) and EDG*3 (Division II), and 282 gallons for EDG*2 (HPCS-Division III)
 2. A separate fuel storage system containing a minimum of 47,547 gallons of fuel for EDG*1 (Division I) and EDG*3 (Division II), and 35,342 gallons for EDG*2 (HPCS-Division III), and
 3. Two fuel oil transfer pumps.

APPLICABILITY: OPERATIONAL CONDITIONS 1, 2, and 3.

ACTION:

- a. With one offsite circuit of the above required AC electrical power sources inoperable, demonstrate the OPERABILITY of the remaining AC sources by performing Surveillance Requirements 4.8.1.1.1 within 1 hour and at least once every 8 hours thereafter. Restore the offsite circuit to OPERABLE status within 72 hours or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.
- b. With either diesel generator EDG*1 or EDG*3 inoperable, demonstrate the OPERABILITY of the above required AC offsite sources by performing Surveillance Requirement 4.8.1.1.1 within 1 hour and at least once every 8 hours thereafter. If the diesel generator became inoperable from any cause other than preplanned maintenance or testing, within 24 hours, for each OPERABLE diesel generator separately, either verify that the cause of the diesel generator being inoperable does not impact the OPERABILITY of the OPERABLE diesel generator or perform Surveillance Requirement 4.8.1.1.2.a.4*. Restore the inoperable diesel generator to OPERABLE status within 72 hours or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

* This is required to be completed regardless of when the inoperable diesel generator is restored to OPERABLE status. The provisions of Specification 3.0.2 are not applicable.



ELECTRICAL POWER SYSTEMS

AC SOURCES

AC SOURCES - OPERATING

LIMITING CONDITIONS FOR OPERATION

3.8.1.1 (Continued)

ACTION:

- h. With one offsite circuit of the above-required AC electrical power sources inoperable and diesel generator EDG*2 inoperable, apply the requirements of ACTIONS a and d specified above.
- i. With either diesel generator EDG*1 or EDG*3 inoperable and diesel generator EDG*2 inoperable, apply the requirements of ACTIONS b, d, and e specified above.
- j. With one or more diesel fuel storage tank(s) containing less than the minimum quantity of fuel oil but greater than or equal to 40,755 gallons of fuel for EDG*1 and EDG*3, or greater than or equal to 30,293 gallons for EDG*2, restore fuel oil to required levels within 48 hours or declare the affected diesel generator(s) inoperable.
- k. With one or more diesel generator(s) with new diesel fuel oil properties not within limits, restore stored fuel oil properties to required limits within 30 days or declare the affected diesel generator(s) inoperable.
- l. With one or more diesel generator(s) with stored fuel total particulates not within limits, restore stored fuel total particulates to required limits within 7 days or declare the affected diesel generator(s) inoperable.

SURVEILLANCE REQUIREMENTS

4.8.1.1.1 Each of the above required independent circuits between the offsite transmission network and the onsite Class 1E distribution system shall be determined OPERABLE at least once every 7 days by verifying correct breaker alignments and indicated power availability.

4.8.1.1.2 Each of the above required diesel generators shall be demonstrated OPERABLE:

- a. In accordance with the frequency specified in Table 4.8.1.1.2-1 on a STAGGERED TEST BASIS by:
 - 1. Verifying the fuel level in the day fuel tank.
 - 2. Verifying the fuel level in the fuel storage tank.



ELECTRICAL POWER SYSTEMS

AC SOURCES

AC SOURCES - OPERATING

SURVEILLANCE REQUIREMENTS

4.8.1.1.2.a (Continued)

3. Verifying each fuel transfer pump starts and transfers fuel from the storage system to the day fuel tank.
4. Verifying that on a start from ambient conditions:
 - a) That diesel engines EDG*1 and EDG*3 accelerate to at least 600 rpm in less than or equal to 10 seconds.* The generator voltage and frequency shall be 4160 ± 416 volts and 60 ± 3.0 Hz within 10 seconds and 4160 ± 416 volts and 60 ± 1.2 Hz within 13 seconds after the start signal.
 - b) That diesel engine EDG*2 accelerates to at least 870 rpm and at least 3750 volts in less than or equal to 10 seconds.* The generator voltage and frequency shall be 4160 ± 416 volts and 60 ± 1.2 Hz within 15 seconds after the start signal.
 - c) Each diesel generator shall be started for this test by using one of the following signals:
 - 1) Manual.
 - 2) Simulated loss of offsite power by itself.
 - 3) Simulated loss of offsite power in conjunction with an ESF actuation test signal.
 - 4) An ESF actuation test signal by itself.
5. Verifying that after the diesel generator is synchronized, it is loaded to greater than or equal to 4400 KW for diesel generators EDG*1 and EDG*3 and greater than or equal to 2600 KW for diesel generator EDG*2 in less than or equal to 90 seconds* and operates with these loads for at least 60 minutes.
6. Verifying the diesel generator is aligned to provide standby power to the associated emergency buses.

* All diesel generator starts for the purpose of this surveillance test may be preceded by an engine prelube period. Further, all surveillance tests, with the exception of once per 184 days, may also be preceded by warmup procedures and may also include gradual loading as recommended by the manufacturer so that the mechanical stress and wear on the diesel engine is minimized.



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ELECTRICAL POWER SYSTEMS

AC SOURCES

AC SOURCES - OPERATING

SURVEILLANCE REQUIREMENTS

4.8.1.1.2.a (Continued)

7. Verifying the pressure in diesel generator air start receivers for EDG*1 and EDG*3 to be greater than or equal to 225 psig.
 8. Verifying the pressure in diesel generator air start receivers for EDG*2 to be greater than or equal to 190 psig.
- b. By removing accumulated water:
1. From the day tank at least once per 31 days and after each occasion when the diesel is operated for more than 1 hour, and
 2. From the storage tank at least once per 31 days.
- c. By verifying fuel oil properties of new and stored fuel oil are tested in accordance with, and maintained within the limits of, the Diesel Fuel Oil Testing Program.
- d. Deleted.



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ELECTRICAL POWER SYSTEMS

AC SOURCES

AC SOURCES - SHUTDOWN

LIMITING CONDITIONS FOR OPERATION

3.8.1.2 As a minimum, the following AC electrical power sources shall be OPERABLE:

- a. One circuit between the offsite transmission network and the onsite Class 1E distribution system, and
- b. Diesel generator EDG*1 or EDG*3, and diesel generator EDG*2 when the HPCS system is required to be OPERABLE, with each diesel generator having:
 1. Separate day fuel tanks containing a minimum of 403 gallons of fuel for EDG*1 (Division I) and EDG*3 (Division II) and 282 gallons for EDG*2 (HPCS-Division III).
 2. A separate fuel storage system containing a minimum of 47,547 gallons of fuel for EDG*1 (Division I) and EDG*3 (Division II) and 35,342 gallons of fuel for EDG*2 (HPCS-Division III).
 3. Two fuel oil transfer pumps.

APPLICABILITY: OPERATIONAL CONDITIONS 4, 5, and *.

ACTION:

- a. With less than the the above required AC electrical power sources OPERABLE, suspend CORE ALTERATIONS, handling of irradiated fuel in the secondary containment, operations with a potential for draining the reactor vessel and crane operations over the spent fuel storage pool when fuel assemblies are stored therein. In addition, in OPERATIONAL CONDITION 5, with the water level less than 22 feet 3 inches above the reactor pressure vessel flange, immediately initiate corrective action to restore the required power sources to OPERABLE status as soon as practical.
- b. With diesel generator EDG*2 of the above required AC electrical power sources inoperable, restore the inoperable diesel generator to OPERABLE status within 72 hours or declare the HPCS system inoperable and take the ACTION required by Specification 3.5.2 and 3.5.3
- c. The provisions of Specification 3.0.3 are not applicable.
- d. With one or more diesel fuel storage tank(s) containing less than the minimum quantity of fuel oil but greater than or equal to 40,755 gallons of fuel for EDG*1 and EDG*3, or greater than or equal to 30,293 gallons for EDG*2, restore fuel oil to required levels within 48 hours or declare the affected diesel generator(s) inoperable.

* When handling irradiated fuel in the secondary containment.



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ELECTRICAL POWER SYSTEMS

AC SOURCES

AC SOURCES - SHUTDOWN

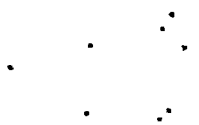
LIMITING CONDITIONS FOR OPERATION

3.8.1.2 (Continued)

- e. With one or more diesel generator(s) with new diesel fuel oil properties not within limits, restore stored fuel oil properties to required limits within 30 days or declare the affected diesel generator(s) inoperable.
- f. With one or more diesel generator(s) with stored fuel total particulates not within limits, restore stored fuel total particulates to required limits within 7 days or declare the affected diesel generator(s) inoperable.

SURVEILLANCE REQUIREMENTS

4.8.1.2 At least the above required AC electrical power sources shall be demonstrated OPERABLE per Surveillance Requirements 4.8.1.1.1, 4.8.1.1.2, and 4.8.1.1.3, except for the requirement of 4.8.1.1.2.a.5.



BASES

AC SOURCES, DC SOURCES, AND ONSITE POWER DISTRIBUTION SYSTEMS

3/4.8.1-3 (Continued)

list. Continued plant operation is limited to 72 hours with diesel generator EDG*1 or EDG*3 inoperable. The term "verify" as used in this context means to administratively check by examining logs or other information to determine if certain components are out of service for maintenance or other reasons. It does not mean to perform the Surveillance Requirements needed to demonstrate the OPERABILITY of the component.

When a diesel generator becomes inoperable due to any cause other than preplanned maintenance or testing, there is a requirement in the ACTION to, for each OPERABLE diesel generator separately, either verify that the cause of the diesel generator being inoperable does not impact the OPERABILITY of the OPERABLE diesel generator or perform Surveillance Requirement 4.8.1.1.2.a.4. The term verify in this context means to determine by visual inspection, functional test or other means that the subsystem will perform its function. For diesel generators made by different manufacturers, this verification may consist of a determination that the cause cannot exist if the comparable subsystem is of a different design.

The OPERABILITY of the minimum specified AC and DC power sources and associated distribution systems during shutdown and refueling ensures that (1) the facility can be maintained in the shutdown or refueling condition for extended time periods and (2) sufficient instrumentation and control capability is available for monitoring and maintaining the unit status.

The Surveillance Requirements for demonstrating the OPERABILITY of the diesel generators are in accordance with the recommendations of RG 1.9, "Selection of Diesel Generator Set Capacity for Standby Power Supplies," December 1979; RG 1.108, "Periodic Testing of Diesel Generator Units Used as Onsite Electric Power Systems at Nuclear Power Plants," Revision 1, August 1977; and RG 1.137, "Fuel-Oil Systems for Standby Diesel Generators," Revision 1, October 1979.

The Diesel Fuel Oil Testing Program describes the sampling and test methods for assuring that new and stored fuel are of the appropriate grade and not contaminated with substances that would be detrimental to the operation of the diesel generators. The test, limits, and applicable ASTM Standards for fuel are as follows:

1. New Fuel
 - a. Sample the new fuel oil in accordance with ASTM D4057-81 before addition to the storage tanks;
 - b. Verify in accordance with the tests specified in ASTM D975-81, before addition to the storage tanks, that the sample has an API gravity of within 0.3 degrees at 60°F or a specific gravity of within 0.0016 at 60/60°F, when compared to the supplier's certificate or an absolute specific gravity at 60/60°F of ≥ 0.83 and ≤ 0.89 (or an API specific gravity at 60°F of ≥ 27 and ≤ 39), a kinematic viscosity at 40°C of ≥ 1.9 centistokes and ≤ 4.1 centistokes, and a flash point of $\geq 125^\circ\text{F}$; and
 - c. Verify before addition to the storage tanks that the new fuel oil has a clear and bright appearance when tested in accordance with ASTM D4176-82.



BASES

AC SOURCES, DC SOURCES, AND ONSITE POWER DISTRIBUTION SYSTEMS

3/4.8.1-3 (Continued)

- d. Verify within 31 days after addition to the storage tanks that the other properties specified in Table 1 of ASTM D975-81 are met for new fuel when tested in accordance with ASTM D975-81, except that the analysis for sulfur may be performed in accordance with ASTM D1552-79 or ASTM D2622-82.

2. Stored Fuel

- a. At least once every 31 days sample fuel oil in the storage tanks in accordance with ASTM D2276-78, and verify in accordance with ASTM D2276-78, Method A, that total particulate concentration is less than 10 mg/l.

The Surveillance Requirements for demonstrating the OPERABILITY of the unit batteries are in accordance with the recommendations of RG 1.129, "Maintenance Testing and Replacement of Large Lead Storage Batteries for Nuclear Power Plants," February 1978, and IEEE Standard 450-1980, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Large Lead Storage Batteries for Generating Stations and Substations."

Verifying average electrolyte temperature above the minimum for which the battery was sized, total battery terminal voltage on float charge, connection resistance values, and the performance of battery service and discharge tests ensures the effectiveness of the charging system, the ability to handle high discharge rates, and compares the battery capacity at that time with the rated capacity.

Table 4.8.2.1-1 specifies the normal limits for each designated pilot cell and each connected cell for electrolyte level, float voltage, and specific gravity. The limits for the designated pilot cells float voltage and specific gravity, greater than 2.13 volts and 0.015 below the manufacturer's full-charge specific gravity or a battery charger current that had stabilized at a low value, is characteristic of a charged cell with adequate capacity. The normal limits for each connected cell for float voltage and specific gravity, greater than 2.13 volts and not more than 0.020 below the manufacturer's full-charge specific gravity with an average specific gravity of all the connected cells not more than 0.010 below the manufacturer's full-charge specific gravity, ensures the OPERABILITY and capability of the battery.

Operation with a battery cell's parameter outside the normal limit but within the allowable value specified in Table 4.8.2.1-1 is permitted for up to 7 days. During this 7-day period: (1) the allowable values for electrolyte level ensures no physical damage to the plates with an adequate electron transfer capability; (2) the allowable value for the average specific gravity of all the cells, not more than 0.020 below the manufacturer's recommended full-charge specific gravity ensures that the decrease in rating will be less than the safety margin provided in sizing; (3) the allowable value for an individual cell's specific gravity, ensures that an individual cell's specific gravity will not be more than 0.040 below the manufacturer's full-charge specific gravity and that the overall capability of the battery will be maintained within an acceptable limit; and (4) the allowable value for an individual cell's float voltage, greater than 2.07 volts, ensures the battery's capability to perform its design function.



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BASES

3/4.8.4 ELECTRICAL EQUIPMENT PROTECTIVE DEVICES

Primary containment electrical penetrations and penetration conductors are protected by either de-energizing circuits not required during reactor operation or demonstrating the OPERABILITY of primary and backup overcurrent protection circuit breakers by periodic surveillance. The list of primary containment AC circuits required to be deenergized is contained in administrative procedure NIP-DES-04 and revisions will be processed in accordance with Section 6.0, Administrative Controls.

The Surveillance Requirements applicable to lower voltage circuit breakers provides assurance of breaker reliability by testing at least one representative sample of each manufacturer's brand of circuit breaker. Each manufacturer's molded case and metal case circuit breakers are grouped into representative samples which are then tested on a rotating basis to ensure that all breakers are tested. If a wide variety exists within any manufacturer's brand of circuit breakers, it is necessary to divide that manufacturer's breakers into groups and treat each group as a separate type of breaker for surveillance purposes.

The emergency lighting system overcurrent protective devices ensure that a failure of the non-Class 1E portion of the circuit will not affect the operation of the remaining portions of the Class 1E circuits that are necessary for safe shutdown. The list of these overcurrent protective devices is contained in administrative procedure NIP-DES-04 and revisions will be processed in accordance with Section 6.0, Administrative Controls.

The EPAs provide Class 1E isolation capabilities for the RPS power supplies and the scram power supplies. This is required because the power supplies are not Class 1E power supplies.



PROCEDURE AND PROGRAMS

PROGRAMS

6.8.4 (Continued)

e. Diesel Fuel Oil Testing Program

A diesel fuel oil testing program to implement required testing of both new fuel oil and stored fuel oil shall be established. The program shall include sampling and testing requirements, and acceptance criteria, all in accordance with applicable ASTM Standards. The purpose of the program is to establish the following:

1. Acceptability of new fuel oil for use prior to addition to storage tanks by determining that the fuel oil has:
 - a. an API gravity or an absolute specific gravity within limits,
 - b. a flash point and kinematic viscosity within limits, and
 - c. a clear and bright appearance;
2. Other properties for ASTM fuel oil are within limits within 31 days following addition to storage tanks; and
3. Total particulate concentration of the fuel oil is < 10 mg/l when tested every 31 days in accordance with ASTM D-2276, Method A.



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