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NINE MILE POINT
NUCLEAR STATION

April 27, 2011

U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

ATTENTION: Document Control Desk

SUBJECT: Nine Mile Point Nuclear Station
Unit No. 2; Docket No. 50-410

License Amendment Request Pursuant to 10 CFR 50.90: Extension of the Completion Time for an Inoperable Diesel Generator – Supplemental Information Responding to NRC Follow-up Electrical Engineering Branch Review Questions (TAC No. ME3736)

REFERENCES:

(a) Letter from S. Belcher (NMPNS) to Document Control Desk (NRC), dated March 30, 2010, License Amendment Request Pursuant to 10 CFR 50.90: Extension of the Completion Time for an Inoperable Diesel Generator – Technical Specification 3.8.1, AC Sources – Operating

(b) Letter from T. A. Lynch (NMPNS) to Document Control Desk (NRC), dated June 1, 2010, License Amendment Request Pursuant to 10 CFR 50.90: Extension of the Completion Time for an Inoperable Diesel Generator – Response to NRC Acceptance Review Comments (TAC No. ME3736)

(c) Letter from S. Belcher (NMPNS) to Document Control Desk (NRC), dated December 29, 2010, License Amendment Request Pursuant to 10 CFR 50.90: Extension of the Completion Time for an Inoperable Diesel Generator – Response to NRC Request for Additional Information (TAC No. ME3736)

(d) Letter from R. V. Guzman (NRC) to S. L. Belcher (NMPNS), dated March 15, 2011, Supplemental Request for Additional Information Regarding Nine Mile Point Nuclear Station, Unit No. 2 – Re: Extension of Completion Time for Inoperable Diesel Generator, Electrical Engineering Review (TAC No. ME3736)

A001
NRR

Nine Mile Point Nuclear Station, LLC (NMPNS) hereby transmits supplemental information requested by the NRC in support of a previously submitted request for amendment to Nine Mile Point Unit 2 (NMP2) Renewed Facility Operating License NPF-69. The initial request, dated March 30, 2010 (Reference a), as supplemented by Reference (b), proposed to modify Technical Specification (TS) 3.8.1, "AC Sources – Operating," to extend the Completion Time for an inoperable Division 1 or Division 2 diesel generator (DG) from 72 hours to 14 days. NMPNS responded to a request for additional information relating to the NRC's electrical engineering review in Reference (c). The supplemental information, provided in the Attachment to this letter, responds to follow-up NRC electrical engineering questions documented in the NRC's letter dated March 15, 2011 (Reference d) that were discussed in telephone conferences between NRC and NMPNS staff members on March 7, 2011 and April 8, 2011.

This supplemental information does not affect the No Significant Hazards Determination analysis provided by NMPNS in Reference (a). Pursuant to 10 CFR 50.91(b)(1), NMPNS has provided a copy of this supplemental information to the appropriate state representative. This letter contains no new regulatory commitments.

Should you have any questions regarding the information in this submittal, please contact John J. Dosa, Director Licensing, at (315) 349-5219.

Very truly yours,

STATE OF NEW YORK :
: **TO WIT:**
COUNTY OF OSWEGO :

I, Thomas A. Lynch, being duly sworn, state that I am the Nine Mile Point Plant General Manager, and that I am duly authorized to execute and file this supplemental information on behalf of Nine Mile Point Nuclear Station, LLC. To the best of my knowledge and belief, the statements contained in this document are true and correct. To the extent that these statements are not based on my personal knowledge, they are based upon information provided by other Nine Mile Point employees and/or consultants. Such information has been reviewed in accordance with company practice and I believe it to be reliable.

Subscribed and sworn before me, a Notary Public in and for the State of New York and County of Oswego, this 27th day of April, 2011.

WITNESS my Hand and Notarial Seal:

Notary Public

My Commission Expires:

11/12/2014
Date

TONYA L. JONES
Notary Public in the State of New York
Oswego County Reg. No. 01JO6083354
My Commission Expires 11/12/2014

TAL/DEV

Attachment: Nine Mile Point Unit 2 – Supplemental Information Regarding the Proposed Extension of the Completion Time for an Inoperable Diesel Generator from 72 Hours to 14 Days

cc: Regional Administrator, Region I, NRC
Project Manager, NRC
Resident Inspector, NRC
A. L. Peterson, NYSERDA

ATTACHMENT

NINE MILE POINT UNIT 2

SUPPLEMENTAL INFORMATION REGARDING THE

PROPOSED EXTENSION OF THE COMPLETION TIME FOR AN

INOPERABLE DIESEL GENERATOR FROM 72 HOURS TO 14 DAYS

ATTACHMENT

NINE MILE POINT UNIT 2
SUPPLEMENTAL INFORMATION REGARDING THE
PROPOSED EXTENSION OF THE COMPLETION TIME FOR AN
INOPERABLE DIESEL GENERATOR FROM 72 HOURS TO 14 DAYS

By letter dated March 30, 2010, as supplemented by letter dated June 1, 2010, Nine Mile Point Nuclear Station, LLC (NMPNS) requested an amendment to the Nine Mile Point Unit 2 (NMP2) Renewed Facility Operating License NPF-69. The proposed amendment would modify Technical Specification (TS) 3.8.1, "AC Sources – Operating," to extend the Completion Time (CT) for an inoperable Division 1 or Division 2 diesel generator (DG) from 72 hours to 14 days.

NMPNS responded to a request for additional information (RAI) relating to the NRC's electrical engineering branch (EEEB) review by letter dated December 29, 2010. This attachment responds to follow-up NRC EEEB questions documented in the NRC's letter dated March 15, 2011 that were discussed in telephone conferences between NRC and NMPNS staff members on March 7, 2011 and April 8, 2011. Each individual NRC follow-up question is repeated (in italics), followed by the NMPNS response.

1. ***EEEB Supplemental RAI-3.a***

(a) The source of cooling water for the Division 3 high pressure core spray (HPCS) DG is stated to be Lake Ontario. Provide details on any chemical treatment or filtration systems required to treat the water for cooling a safety related system. DG lube oil and cooling water systems are normally maintained at high temperatures for optimum performance of the engine. Provide details on the effects of lake water temperature on the performance capability of the HPCS diesel.

Response (a)

The DG cooling water system is described in Section 9.5.5 of the NMP2 Updated Safety Analysis Report (USAR). The Division 3 (high pressure core spray) DG has a jacket water system that is an integral part of the diesel engine. The jacket water heat exchanger transfers heat from the engine to the service water system. A temperature regulating valve regulates the flow of jacket water through the jacket water heat exchanger to maintain the jacket water at a constant temperature when the engine is operating. When the engine is in the standby condition, the engine is kept warm by an immersion heater that heats the jacket water, which in turn warms the engine lubricating oil.

As described in the NMPNS letter dated March 30, 2010, in the event that a loss of offsite power (LOOP) occurs while the Division 1 or Division 2 DG is in the proposed extended CT and the other DG (Division 2 or Division 1) becomes unavailable or fails to operate, the Division 3 DG can serve as an alternate source of AC power by manually cross-connecting it to either the Division 1 or Division 2 emergency bus. In this alignment, the Division 3 DG would be powering a service water pump that would provide the cooling water for the Division 3 DG. In addition, the Division 3 DG has been provided with a backup source of cooling water from the fire protection water supply system. Both the service water pumps (the normal cooling water source) and the fire protection water supply pumps (the backup source) take suction from the service water intake tunnel in the screenwell building, whose source of water is Lake Ontario. Filtration and chemical treatment of the water supplied by these two systems is not provided and is not necessary since the water is circulated through the tube side of the DG jacket water heat exchanger, not directly through the engine. Lake water temperature has no adverse effect on the performance of the Division 3 DG since the engine is kept warm when in the standby condition and the jacket water temperature is regulated during engine operation.

(b) Division 1 and Division 2 DGs have adequate fuel oil stored for seven day operation without replenishment. During the extended completion time (CT) for the Division 1 or Division 2 DG, the HPCS DG and its support systems and the portable generator for the DC systems are proposed to perform the safety functions of the DG that is inoperable. Provide details on the fuel oil requirements and capability of support systems for operation of the HPCS DG and DC systems for extended duration.

Response (b)

The Division 3 DG support systems, including the fuel oil storage and transfer system, jacket water system, starting air system, lubrication system, and combustion air intake and exhaust system, are physically separated from and electrically independent of the auxiliary systems for the Division 1 and Division 2 DGs. The Division 3 DG is connected to the Division 3 4.16 kV emergency bus and feeds all Division 3 loads. The Division 3 DG fuel oil storage and transfer system has a storage capacity suitable for 7 days of DG operation. The jacket water and lubrication systems also have capacities suitable for 7 days of DG operation. Makeup fuel oil, jacket water, and lube oil can be readily added, if needed, to extend operation of the DG beyond 7 days. Descriptions of these DG support systems are provided in Sections 9.5.4 through 9.5.8 of the NMP2 USAR.

The 60 kVA, 480/240 VAC, portable generator is a self-contained unit. The fuel tank capacity of 33 gallons provides for approximately 9 hours of continuous operation at full load. Makeup fuel can be readily obtained and added to the fuel tank, if needed, to extend the operating time of the portable generator.

(c) Fuel oil for the diesel driven fire pump is expected to be replenished from an underground fuel storage tank containing 1000 gallons using an electric pump or a hand pump. Provide details on the power source and capacity of the electric pump and the capacity of the hand pump. Demonstrate that the capability of each pump is adequate for the extended duration.

Response (c)

As described in the NMPNS letter dated March 30, 2010, with the Division 3 DG cross-connected to either the Division 1 or Division 2 emergency bus, a service water (SW) pump will be started and SW flow will be aligned to cool the Division 3 DG. The SW system is the normal source of cooling water for the DGs. The Division 3 DG has also been provided with a backup source of cooling water from the NMP2 fire protection water supply system. As described in the response to RAI-3.a provided in NMPNS letter dated December 29, 2010, the fuel oil storage tank for the NMP2 diesel engine driven fire pump has a minimum useable volume of 350 gallons, which provides for approximately 21 hours of uninterrupted diesel engine operation. A further backup is provided by the capability to cross-connect the NMP2 and the Nine Mile Point Unit 1 (NMP1) fire water main loops. With the fire water main loops cross-connected, the NMP1 diesel engine driven fire pump can also provide cooling water for the NMP2 Division 3 DG. The NMP1 diesel engine driven fire pump fuel oil day tank has a minimum useable volume of 150 gallons, which provides for approximately 9 hours of uninterrupted diesel engine operation. An underground fuel storage tank containing a minimum useable volume of 1000 gallons is also provided for the NMP1 diesel engine driven fire pump. Fuel oil from this tank can be transferred to

the NMP1 diesel engine driven fire pump fuel oil day tank by either an electric pump or a hand pump. Both of these pumps have a 10 gpm capacity, versus the diesel engine driven fire pump fuel consumption rate of about 0.27 gpm. Thus, both pumps have adequate capacity to replenish the NMP1 diesel engine driven fire pump fuel oil day tank. The electric pump is powered from a nonsafety-related NMP1 power source; thus, the functionality of this pump will depend on the status of the normal power sources at NMP1.

(d) *The LAR dated March 30, 2010, proposes using a diesel driven fire pump to support operation of the HPCS DG when required to replace the Division 1 or Division 2 DG during extended maintenance activities. Provide details on the consequences of a fire related event resulting in a loss-of-offsite power (LOOP) during the extended DG maintenance activities.*

Response (d)

There are several fire areas in the Normal Switchgear Building and the Control Building where a fire event could potentially result in a LOOP. If such an event occurred, the diesel driven fire pump could be supplying cooling water to the Division 3 DG as well as supplying water to suppress the fire. The NMP2 and NMP1 diesel engine driven fire pumps each have a 2500 gpm capacity. The required cooling water flow to achieve the desired performance of the NMP2 Division 3 DG jacket water heat exchanger is 600 gpm. Analyses performed for the modification to install the fire water cooling water supply to the Division 3 DG have determined that the diesel engine driven fire pump has sufficient capacity to provide cooling water to the Division 3 DG while also supplying fire protection system demands. Thus, there are no adverse consequences on the capability of the diesel driven fire pump to support fire protection demands while concurrently supplying cooling water to the Division 3 DG.

2. EEEB Supplemental RAI-3.b

NMP2 has a procedure to connect a 60 kilovolt-ampere (kVA) portable generator to a Division 1 or Division 2 battery charger to cope with a station blackout (SBO) condition beyond 4 hours; and the estimated time to perform the procedure outlined in the RAI response is 2.5 hours. Provide details on the availability of resources required for manual actions necessary for alignment of the HPCS system and its support systems, and the portable generator for the DC system within the time constraints identified in the LAR. Verify that the complete procedure for this connection can be done in parallel with the manual breaker line-up procedure to cross-connect the Division 3 DG to Division 1 or Division 2, which is estimated to take approximately 2 hours. Describe the sequence of these activities with respect to man-power resources to accomplish the procedure.

Response

The following activities and actions would be occurring during the initial 4-hour period following a SBO condition:

1. Plant Stabilization / SBO Actions

   A minimum of 4 operators (licensed reactor operators and non-licensed plant operators) are needed to monitor and stabilize plant conditions and to accomplish certain actions, consistent with the SBO coping analysis. These actions, directed by the special operating procedures for SBO and loss of AC power, include the following:

   (a) From the Control Room (2 operators):
   - Operate the reactor core isolation cooling (RCIC) system in the manual flow control mode to maintain reactor water level.
   - If the Division 3 DG is the only DG running, then shut it down to preserve the engine for later use, since the engine does not have cooling water lined up at this time (involves a single pushbutton on the electrical control board).
   - Place the RCIC room fire zone in "Alarm Only" using a single control switch in the Control Room, and bypass the RCIC room high temperature isolation within 15 minutes using keylock switches in the Control Room.
   - Open all Control Room and Control Room panel doors within 30 minutes.
   - Place the main turbine bearing oil pump in "Pull-to-Lock" within two hours.

   (b) From Outside the Control Room (2 operators):
   - Open all Relay Room doors and Relay Room panel doors in 30 minutes.
   - Shut down the plant process computer in one hour.
   - Reduce Control Room and Relay Room heat loads in one hour.
   - If the turbine does not stop rolling in two hours, break condenser vacuum by opening five manually operated valves in the Turbine Building.
   - Open RCIC room doors (Reactor Building, elevation 175') in two hours.
   - Reduce lighting loads in two hours.
   - Verify five (5) containment isolation valves specified in station blackout procedures are closed (only if containment isolation is required and reactor water level cannot be maintained above top of active fuel – not time specific).

2. Actions Prior to Establishing Division 3 DG Cross-Connection

   Prior to cross-connecting the Division 3 DG to either the Division 1 or Division 2 emergency bus, a minimum of 4 additional operators are needed to perform actions both from the Control Room and in other plant areas. These actions include the following:

   (a) Two (2) operators are required to lineup the backup cooling water supply from the NMP2 fire protection water supply system to the Division 3 DG (if available). This action is performed in the DG rooms and the divisional switchgear rooms, which are all on the same elevation of the Control Building, and is estimated be completed within 15 minutes. This action includes restart of

the Division 3 DG. Once the Division 3 DG is restarted with cooling water supplied from the fire water system, the Division 3 DG has the necessary support system required to continue operation while the alignments are made to supply the Division 1 or Division 2 emergency switchgear from the Division 3 DG.

(b) One (1) operator in the Control Room and up to 3 operators working in other plant areas (Relay Room, switchgear rooms, and switchyards) are required to perform fault identification and isolation. Depending on the ability to promptly identify the fault location, fewer operators may be needed to complete this action. This action ensures that a faulted bus is not inadvertently energized, and will support the decision process for determining if the Division 1 or Division 2 emergency switchgear is available and can be energized from the Division 3 DG. It is expected that 2 of these 4 operators are the same operators that performed the backup cooling water supply lineup, since both activities are performed in adjacent areas. One of these operators may intermittently support other actions being performed in parallel with this action.

3. Actions to Energize Division 1 or Division 2 from Division 3 DG

Following completion of the fault identification and isolation activity, either the Division 1 or Division 2 emergency switchgear can be re-energized from the Division 3 DG. Three (3) operators are required to complete this action, as follows:

(a) One (1) operator is required in the Control Room to perform switch manipulations that will establish the breaker alignment needed to energize the Division 1 or Division 2 emergency switchgear from the Division 3 DG, start a service water pump, and ensure that minimum flow requirements are met for the operating service water pump.

(b) One (1) operator is required in the service water pump bay to operate the service water pump discharge valve 600-volt breaker and to manually throttle open the service water pump discharge blocking valve following service water pump start.

(c) One (1) operator is assigned to monitor the operating Division 3 DG while it is loaded remotely from the Control Room.

The above 3 operators can be the same operators that perform the fault identification/isolation activity, since the fault identification/isolation and the cross-connection activities cannot be performed in parallel.

The procedure for connection of the portable generator (summarized in the response to RAI-3.b provided in the NMPNS letter dated December 29, 2010) may be performed in parallel with any of the activities described above. All of the steps to establish the connection of the portable generator and the 480 to 575 VAC transformer can be performed by 2 qualified station electricians. Once all the necessary connections are made, the manipulation of 3 breakers is required to align the portable generator as the AC power supply to a divisional battery charger. These three breakers (one DC bus breaker, one battery charger AC input breaker, and one DC output breaker) are all located within the same divisional switchgear room. With the assistance of the 2 electricians, only one operator is needed for the breaker manipulation, with completion estimated to take approximately 15 minutes. If an operator is unavailable to perform the

breaker manipulations, the station electricians are qualified to operate the breakers and only notification to Operations that the breaker operations will be performed is necessary. Thus, an operator is not required to establish the portable generator connection.

Based on the above discussion, the largest manpower requirement occurs during the fault identification and isolation activity (up to 4 operators), which occurs in parallel with the plant stabilization / SBO actions activity (4 operators), for a total of up to 8 required operators. The normal shift complement consists of 10 licensed reactor operators and non-licensed plant operators plus 3 senior reactor operators (SROs). The minimum shift complement consists of 8 licensed reactor operators and non-licensed plant operators plus 3 SROs. One of the 8 operators comprising the minimum shift complement is assumed not available to support the SBO response functions because one operator is needed to support emergency plan implementation. However, one operator can transition between one activity and another activity on an as-needed basis so that no more than 7 operators are needed at any given time. Thus, it is concluded that, even with a minimum shift compliment, adequate manpower resources are available to accomplish cross-connection of the Division 3 DG to either the Division 1 or Division 2 emergency switchgear in parallel with connection of the portable generator.

3. *EEEB Supplemental RAI-3.c*

The purpose of the supplemental power source is to provide defense-in-depth, avoid entry into station blackout conditions for extended duration and maintain the plant within design bases. The station blackout analyses may be used to demonstrate that the plant can be maintained in a safe condition while the supplemental alternating current (AC) source is being aligned. The NRC staff's expectation is that this supplemental power source has adequate capacity to bring the plant to a cold shutdown, if required, during the time that the Division 1 or Division 2 DG is in an extended outage. Provide details about the capability of the proposed supplemental power source to bring the plant to a cold shutdown.

Response

Cross-connection of the Division 3 DG to either the Division 1 or Division 2 emergency bus would only be utilized in the event that a LOOP occurs when the Division 1 or Division 2 DG is inoperable (e.g., for maintenance activities requiring entry into the proposed extended TS CT) and the redundant DG fails to operate. This set of postulated concurrent events effectively creates an SBO condition. An evaluation of the capability of the Division 3 DG to supply the electrical loads needed to achieve a safe shutdown condition for this SBO condition was described in detail in the response to Acceptance Review Comment 8 provided in the NMPNS letter dated June 1, 2010. The results of the evaluation are summarized below.

Division 3 DG Supplying Division 1 Emergency Bus

The maximum net running load to be supplied by the Division 3 DG was determined to be 2748 kW, consisting of:

- Loads permanently fed from the emergency bus through 600-V load centers (e.g., motor-operated valves; battery chargers; heating, ventilating, and air conditioning equipment; etc.)
- One manually connected Residual Heat Removal (RHR) system pump
- One manually connected Service Water (SW) system pump

- One manually connected Spent Fuel Pool (SFP) cooling pump
- Division 3 loads (not including the HPCS pump)

Division 3 DG Supplying Division 2 Emergency Bus

The maximum net running load to be supplied by the Division 3 DG was determined to be 2674 kW, consisting of:

- Loads permanently fed from the emergency bus through 600-V load centers (e.g., motor-operated valves; battery chargers; heating, ventilating, and air conditioning equipment; etc.)
- One manually connected RHR system pump
- One manually connected SW system pump
- One manually connected SFP cooling pump
- Division 3 loads (not including the HPCS pump)

The response to RAI-3.c provided in the NMPNS letter dated December 29, 2010 outlined two possible approaches for achieving cold shutdown conditions under the postulated SBO condition; one approach utilizing Division 1 equipment energized from the Division 3 DG, and one approach utilizing Division 2 equipment energized from the Division 3 DG. For both approaches, the load on the Division 3 DG would not exceed the values noted above (i.e., 2748 kW when powering Division 1 equipment and 2674 kW when powering Division 2 equipment). For either approach, the net loading is less than the Division 3 DG 2000-hour rating of 2850 kW. In addition, as noted in the response to Acceptance Review Question 8 provided in the NMPNS letter dated June 1, 2010, these net load values assume that a SFP cooling pump (a 330 kW load) is manually started at T = 2 hours to restore cooling water flow to the spent fuel pool. Based on actual spent fuel pool cooling requirements, starting a SFP cooling pump is not needed until approximately 5 hours (or longer) after inception of the event (depending on the spent fuel pool initial temperature and spent fuel heat load). Thereafter, the SFP cooling pump could be operated intermittently to maintain the spent fuel pool temperature below the design value of 150°F. When the SFP cooling pump is not operating, loading on the Division 3 DG would be below its continuous rating of 2600 kW. Thus, the Division 3 DG is capable of supplying the loads needed to achieve a cold shutdown condition following the postulated SBO condition. See also the response to EEEB Supplemental RAI-3.d below.

4. EEEB Supplemental RAI-3.d

The LAR states that the calculated steady state load for the HPCS DG is 2748 kilowatts (kW) when required to replace the Division 1 or Division 2 DG. The HPCS DG is expected to operate at steady state load for an extended duration. According to the NMPNS RAI response in letter dated December 29, 2010, the capability of HPCS DG to support this loading was verified during the last three surveillance runs for the 2-hour load range required by TS surveillance requirement (SR) 3.8.1.12a. The capability of the DG operation for an extended duration is demonstrated under TS SR 3.8.1.12b. The current SR requires the DG to be tested in the range of 2340 kW to 2600 kW. Provide details on the methods used to verify the capability of the HPCS DG for extended operation at 2748 kW.

Response

As noted in the response to EEEB Supplemental RAI-3.c above, the maximum net running load to be supplied by the Division 3 DG when supplying the Division 1 emergency bus was determined to be 2748 kW. This net load value assumes that a SFP cooling pump (a 330 kW load) is manually started at T = 2 hours to restore cooling water flow to the spent fuel pool. Based on actual spent fuel pool cooling requirements, starting a SFP cooling pump is not needed until approximately 5 hours (or longer) after inception of the event (depending on the spent fuel pool initial temperature and spent fuel heat load). Thereafter, the SFP cooling pump could be operated intermittently to maintain the spent fuel pool temperature below the design value of 150°F. When the SFP cooling pump is not operating, loading on the Division 3 DG would be below its continuous rating of 2600 kW.

In addition, there are DG support system loads included in the net running load of 2748 kW that would not be operating if the Division 1 DG was not operating. These include the DG fuel oil transfer pumps, DG air start system compressor, and DG room exhaust fans, comprising a total load of 66 kW. Subtracting these DG support system loads results in a net Division 1 running load of 2682 kW to be supplied by the Division 3 DG (including an operating SFP cooling pump), which is only a small amount (about 3 percent) above the 2600 kW continuous rating of the Division 3 DG. If supplying the Division 2 emergency bus, the Division 3 DG load would be 2674 kW minus 66 kW, yielding 2608 kW (including an operating SFP cooling pump), which is slightly more than the 2600 kW continuous rating of the Division 3 DG.

Qualification of the Division 3 DG is addressed in General Electric (GE) Licensing Topical Report NEDO-10905, "High Pressure Core Spray System Power Supply Unit," May 1973, and Amendment 3, August 1979. This topical report (together with the engine manufacturer's user manual) establishes the 2000-hour rating of the Division 3 DG as 2850 kW. The topical report also describes load-carrying capability tests that were performed on a DG with a 2600 kW continuous rating, similar to that employed at NMP2, including operation at 110% of the continuous rating (i.e., 2850 kW) for a period of one hour. From these tests the topical report concluded that the DG could carry 100% and 110% of the rated load without exceeding the manufacturer's design limits for lube oil, jacket water, and turbocharger exhaust temperatures. The NRC accepted the Division 3 DG qualification test program described in NEDO-10905 in References 1 and 2.

NMPNS has not located any test data for operation of a DG similar to the NMP2 Division 3 DG at 110% of the continuous rating for an extended duration (i.e., a period greater than 2 hours). Performing such testing on the NMP2 Division 3 DG is not desirable as it would induce more engine wear, requiring additional, potentially significant, maintenance. Based on the information documented in GE Licensing Topical Report NEDO-10905 and a net Division 1 running load (2682 kW) that is only a small amount above the 2600 kW continuous rating of the Division 3 DG, NMPNS concludes that the Division 3 DG is capable of operating for an extended period when powering either the Division 1 or Division 2 loads following a LOOP that occurs during the proposed extended DG CT.

References

1. Letter from O. D. Parr (NRC) to G. G. Sherwood (GE) dated March 31, 1978, General Electric High Pressure Core Spray System Power Supply Unit; Qualification Testing

2. Memorandum for O. D. Parr (NRC) from F. Rosa (NRC) dated April 1, 1980, General Electric Topical Report NEDO-10905-3

5. EEEB Supplemental RAI-4

The licensee stated that it is not necessary to establish TS requirements to implement the compensatory measures associated with the DG CT extension amendment. Several studies have been performed (e.g., NUREG-1784 and NUREG/CR-6890) which concluded that the average duration of LOOP events has increased from the duration assumed at the time of issuance of the SBO Rule. As such, from a deterministic perspective, the NRC staff considers that the compensatory measures associated with ensuring that the supplemental source is available before entering and during the extended 14-day CT is of high regulatory significance and, should therefore, be enforced via TS actions. This is consistent with recent approvals of extended CTs for onsite power sources. The NRC staff considers TS amendments related to the availability of the supplemental source as an adequate assurance that plant safety will be maintained during the extended CT. The proposed amendments should:

(a) Identify the actions that will be taken if the supplemental source becomes unavailable during the extended DG (Division 1 or 2) outage, and

(b) Ensure that the availability of the supplemental source will be verified at least once every 12 hours.

Response

There are two supplemental sources of AC power that are discussed in the proposed license amendment to extend the CT for an inoperable Division 1 or Division 2 DG from 72 hours to 14 days. These are: (1) the Division 3 (HPCS) DG; and (2) the 60 kVA, 480/240 VAC, portable generator. Each is addressed in the following paragraphs.

Division 3 DG

As described in detail in the response to RAI-4 provided in the NMPNS letter dated December 29, 2010, operability requirements applicable to the HPCS system are contained in TS 3.5.1 (system requirements) and in TS 3.8.1 (Division 3 (HPCS) DG requirements). Both the HPCS system and the Division 3 DG are required to be operable in Modes 1, 2, and 3. With a Division 1 or Division 2 DG out of service and declared inoperable, the longest time that the HPCS DG could subsequently be inoperable prior to initiating a TS-required plant shutdown would be 28 hours. Further TS requirements for the Division 3 DG are not necessary as the existing requirements are sufficiently restrictive.

Satisfactory performance of the surveillances specified in TS 3.8.1 verifies that the Division 3 DG is operable. Once operability of the Division 3 DG is established, it remains operable unless there is

information to the contrary. Such information is typically obtained during normal operator rounds conducted once each 12-hour shift, or while monitoring indications in the Control Room. The addition of a periodic TS-required verification of ongoing Division 3 operability is not necessary.

Portable generator

Availability of the portable generator as a temporary source of AC power to one of the Division 1 or Division 2 battery chargers is a feature that is proposed to be controlled as a regulatory commitment that will be incorporated into the TS bases and plant procedures. The use of the portable generator can extend the SBO coping duration beyond 4 hours, and can provide operational flexibility in establishing equipment lineups for achieving cold shutdown conditions following the postulated SBO condition. However, the use of the portable generator is not credited in the SBO coping analysis that established the 4-hour coping duration, and its use is not necessary to achieve cold shutdown conditions following the postulated SBO condition. Thus, operability requirements for the portable generator do not meet the conditions established in 10 CFR 50.36 for inclusion in the TS.