



Entergy Nuclear Northeast
Indian Point Energy Center
450 Broadway, GSB
P.O. Box 249
Buchanan, NY 10511-0249
Tel 914 254 6700

John A Ventosa
Site Vice President

July 23, 2013

NL-13-102

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
11555 Rockville Pike
Rockville, MD 20852

SUBJECT: Response to Request For Additional Information Regarding Emergency Diesel Generator Fuel Oil Supplies (TAC No. ME9264)
Indian Point Unit Number 3
Docket No. 50-286
License No. DPR-64

REFERENCES:

1. Entergy Letter NL-12-097 to NRC Regarding License Amendment Request for Emergency Diesel Generator Fuel Oil System, dated August 14, 2012 (Accession No. ML12234A250)
2. Entergy Letter NL-13-015 to NRC Regarding Response to Request For Additional Information Regarding Emergency Diesel Generator Fuel Oil System (TAC No. ME9264), dated April 15, 2013
3. NRC Letter to Entergy, Request for Additional Information Regarding Emergency Diesel Generator Fuel Oil Supplies (TAC No. ME9264), Dated June 27, 2013

Dear Sir or Madam:

Entergy Nuclear Operations, Inc, (Entergy) requested a License Amendment, References 1, to Operating License DPR-64, Docket No. 50-286 for Indian Point Nuclear Generating Unit No. 3 (IP3). This was supplemented in a response to a request for additional information (Reference 2). The proposed changes revise Technical Specification (TS) Limiting Condition for Operation (LCO) 3.8.3, "Diesel Fuel Oil, and Starting Air," to relocate specific numerical values for fuel oil storage volumes from the TSs to the TS Bases in accordance with Technical Specification Task Force (TSTF) 501 Revision 1. On June 27, 2013 the NRC staff identified the need for additional information to complete their review (Reference 3). Entergy is providing additional information in response to this request (see Attachment and Enclosure).

There are no new commitments being made in this submittal.

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UPR

If you have any questions or require additional information, please contact Mr. Robert Walpole, Manager, Licensing at (914) 254-6710.

I declare under penalty of perjury that the foregoing is true and correct. Executed on July 23, 2013

Sincerely,

A handwritten signature in black ink, appearing to read 'JAV/sp', with a large, stylized initial 'J'.

JAV/sp

Attachment: Response to Request For Additional Information Regarding Emergency Diesel Generator Fuel Oil

Enclosure: Copies of Prior Submittals to the NRC Supporting Response to Request For Additional Information

cc: Mr. Douglas Pickett, Senior Project Manager, NRC NRR DORL
Mr. William M. Dean, Regional Administrator, NRC Region 1
NRC Resident Inspectors Office
Mr. Francis J. Murray, Jr., President and CEO, NYSERDA
Ms. Bridget Frymire, New York State Dept. of Public Service

ATTACHMENT TO NL-13-102

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION
REGARDING EMERGENCY DIESEL GENERATOR FUEL OIL SYSTEM

ENTERGY NUCLEAR OPERATIONS, INC.
INDIAN POINT NUCLEAR GENERATING UNIT NO. 3
DOCKET NO. 50-286

By letter dated August 14, 2012, supplemented in letter dated April 15, 2013, Entergy Nuclear Operations, Inc, (Entergy) submitted a license amendment request for U.S. Nuclear Regulatory Commission (NRC) review that would revise the Technical Specifications (TSs) for Indian Point Unit No. 3 (IP3): The proposed changes revise Technical Specification (TS) Limiting Condition for Operation (LCO) 3.8.3, "Diesel Fuel Oil, and Starting Air," to relocate specific numerical values for fuel oil storage volumes from the TSs to the TS Bases in accordance with Technical Specification Task Force (TSTF) 501 Revision 1. On June 27, 2013 the NRC staff identified the need for additional information to complete their review. The information requested and the response is as follows:

Question 1 RAI-EPTB-7

Chapter 8.2 of the Indian Point 3 Updated Final Safety Analysis Report (UFSAR) provides the following description of the licensing basis for the DG Fuel Oil Storage Tanks:

The IP3 Fuel Oil Storage Tanks provide sufficient fuel for at least 48 hours of minimum safeguards equipment operation when any two of the DGs and the associated DG Fuel Oil Storage Tanks are available and Technical Specification 3.8.3 requires each to contain 5,365 usable gallons of fuel oil.

Section 9.5.3 of the Nuclear Regulatory Commission's Safety Evaluation Report (SER) for Indian Point 3, dated September 21, 1973, states the following:

With all three transfer pumps powered from essential buses, approximately 93 hours of diesel fuel is available. In the event of failure of a Single transfer pump, up to 62 hours operation is available.

Please provide the documentation that approved lowering the number of hours of available emergency diesel generator (EDG) operation stated in the September 21, 1973 SER to the current number of hours of available EDG operation stated in the Indian Point 3 UFSAR.

Response

The NRC issued the SER on September 21, 1973 where they discussed 93 hours of available diesel fuel. Entergy was unable to find an NRC SER issued prior to the Operating License on December 15, 1975 that specifically approved lowering the number of hours of available fuel oil for emergency diesel generator (EDG) operation. Entergy did identify the following which indicate that a change to 48 hours of available fuel oil was submitted to the NRC for review and approval prior to the Operating License:

1. Question 8.8, answered in Supplement 3 dated April 1972, and associated FSAR pages are enclosed. They provide some discussion of the underground fuel oil tanks but do not mention the 93 hours.
2. The response to Question 8.8 was revised in Supplement 30, May 1975 and Supplement 31, October 1975. The associated FSAR pages (revised up to Supplement 30) discussed the 48 hours of operation with minimum safeguards. Both are enclosed.

3. The Appendix A to the Operating License, issued April 5, 1976, discussed the 48 hours with minimum safeguards in the Bases. Selected pages are enclosed.

The 48 hour value currently in the FSAR was discussed in an NRC SER as part of Technical Specification Amendment 153 (NRC letter to Indian Point, Issuance of Amendment For Indian Point Nuclear Generating Unit No. 3 (TAC NO. M90054)" dated October 7, 1994).

ENCLOSURE TO NL-13-102

COPIES OF PRIOR SUBMITTALS TO THE NRC SUPPORTING
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

Prior Submittals

Question 8.8, Supplement 3, and Associated FSAR Pages
Question 8.8, Supplement 31
FSAR Pages through Supplement 30
Appendix A Pages from 4-5-76 License

ENERGY NUCLEAR OPERATIONS, INC.
INDIAN POINT NUCLEAR GENERATING UNIT NO. 3
DOCKET NO. 50-286

QUESTION 8.8

Justify your 80 hours, as opposed to seven-day, onsite diesel fuel supply.

ANSWER

The three individual storage tanks are specified in the Technical Specifications to have a minimum inventory of 19,000 gallons of diesel fuel. This is sufficient for at least 80 hours minimum safeguards equipment. In addition, the Technical Specifications require 22,000 gallons to fuel as minimum storage available in other normal supply tanks; this is sufficient for an additional 90 hours of minimum safeguards equipment. These supplies will assure operation of two diesels at the minimum load for engineered safeguards equipment for more than seven days. Also, commercial oil supplies and trucking facilities exist to assure deliveries within a day's notice. See Revised PSAR Pages 8.2-13 and 13a, Supplement 3.

An overspeed condition causes improper generator output and therefore, the diesel generator should be shut down for corrective action to be taken to restore the generator output to normal.

The units will use diesel oil spec No. 2. A 175 gallon "day" tank is located at each of the units. Three 7700 gallon, underground, fuel oil storage tanks, each fitted with a transfer pump, level switch assembly and dial level indicator, are provided on site. Each transfer pump is arranged to discharge to either a normal or emergency header and each header independently supplies the "day" tanks at each engine. The level switch stops the adjacent transfer pump when storage tank level falls to within 12 inches of the tank bottom. Normally, two tanks would be completely filled and the third filled to within two feet of full. This third tank would be the service tank and its pumps selected to run. As level in the service tank falls to 34 inches from full (5676 gallons innage), an alarm signal is sounded in the central control room and administrative action must be taken to refill the tank. Thus, normally two tanks are filled (at 7700 gallon innage) and the service tank has at least 5676 gallons or a total of 21,076 gallons of which 1314 is nominally unavailable and 20,762 gallons are available. Two diesel engines at recirculation phase load would operate for 89 hours. In the unlikely event that one of the filled tanks is unavailable, 12,500 gallons is available which is sufficient to operate two engines at recirculation phase load in excess of the required 48 hours (duration 54 hours). Transfer of oil from each underground storage tank to each unit "day" tank is accomplished automatically. Any tank mounted oil transfer pump is capable of serving any one or more "day" tanks through manual valving.

Additional fuel oil suitable for use in the diesel generators will be stored on site. The minimum storage of 22,000 gallons of additional fuel oil will assure operation of two diesel for 90 additional hours at the minimum load for engineered safeguards. Additional supplies of diesel oil are available locally. Under normal conditions, 25,000 gallons can be delivered on a one or two day notice. Additional supplies are also maintained in the New Rochelle - Mount Vernon area (about 40 miles from the plant) and are available for use during emergencies, subject to extreme cold weather conditions (increased domestic heating usage) and available transportation.

Diesel-Generator Separation

3 The diesel engine-generators are located in a tornado proof reinforced concrete building immediately adjacent to the control building. The engine generators are arranged on 13'-0" centers, parallel to each other with approximately 10'-0" between engine components. The structure will be provided with internal walls to separate the three diesel generators and their associated cabling, control panel, and switchgear from each other for fire protection. Individual fire detection

and automatic protection spray systems are provided over each engine and fuel oil day tank. The detection system which annunciates in the main control room is designed to sense heat in order to quickly actuate the detection and spray devices. In addition, manual fire fighting equipment is located in each personnel access door.

Each control panel contains relays and metering equipment for the diesel-engine generator. In the event of an electrical fire the event is annunciates in the main control room. With the compartmentalized diesel-engine generator separation design, spread of fire from one unit and its associated equipment to the other units is minimized.

Each diesel generator has its own small fuel storage (day) tank that feeds the fuel oil pump on the engine. All day tanks are automatically filled during engine operation from three separate underground storage tanks outside the diesel generator building. Each storage tank has its own supply pump mounted in a manhole opening in the top of the tank above oil level. It is therefore unlikely that a fire associated with any one of the small fuel oil storage (day) tanks would prevent oil from being supplied to the remaining two diesels.

Loading Description

Each unit is to be started on the occurrence of either of the following incidents:

1. Initiation of safety injection operation.
2. Undervoltage on any of the 480 volt buses.

On occurrence of undervoltage the engines run at idle and can be connected to deenergized buses by the operator from the control room if desired.

QUESTION 8.8

Justify your 80 hours, as opposed to seven-day, onsite diesel fuel supply.

ANSWER

The three individual storage tanks are specified in the Technical Specifications to have a minimum inventory of 5,676 gallons of diesel fuel in each tank. Assuming only two of the underground storage tanks are available and 5,238 gallons usable per tank, this is sufficient fuel for at least 48 hours of minimum safeguards equipment.

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In addition, the Technical Specifications require 26,300 gallons of fuel as minimum storage available for Unit No.3 usage in other normal supply tanks on site or at the Buchanan Substation. This is sufficient to assure continuous operation of two diesels at the minimum engineered safeguards load for a total of seven days. Also, additional supplies of diesel fuel oil are available locally.

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An overspeed condition causes improper generator output and therefore, the diesel generator should be shut down for corrective action to be taken to restore the generator output to normal.

Fuel oil for the diesel generators is stored in three 7700 gallon underground storage tanks located on the south side of the Diesel-Generator Building. There is one common truck hose connection and a 4-inch fill line for all three tanks, complete with a four-inch shutoff valve at each tank. The overflow from any tank will cascade into an adjacent tank. Each tank is equipped with a single vertical fuel oil transfer pump that discharges to either a normal or emergency header. Each header independently supplies the day tank at each diesel. An alarm will sound in the control room when the level in any underground storage tank drops approximately 34 inches from the top of the tank (5676 gallons innage). Administrative action will be taken to refill the tank. In addition, there is a low-level pump cut-out switch located on each tank to prevent damage to the fuel oil transfer pump. Each tank is also equipped with a sounding connection and a level indicator. Decrease in level in a day tank to approximately 115 gallons (65% full) will cause the transfer pump in the corresponding underground storage tank to start. Once started, the pump will continue to run until the day tank is filled. When the tank is filled, a level switch will initiate closing of the day tank inlet valve and discontinue operation of the fuel oil transfer pump.

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Each diesel is equipped with a 175-gallon day tank, which is sufficient for approximately the first 75 minutes of post-accident operation (30 minutes injection and 45 minutes recirculation) with the tank 65% full.

Fuel flows by gravity to the engine, insuring a static head of fuel oil on the injection manifolds. Excess fuel oil is collected in a drip tank located in the base of the diesel engine. A manually operated drain pump is provided so that the drip tank can be emptied back into the day tank. The diesel fuel oil storage and transfer system diagram is shown in Figure 8.2-7.

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30 | Approximately 37,000 gallons of fuel oil is required to operate two
diesels at minimum safeguards load continuously for 168 hours. Approx-
imately 10,700 gallons (10,470 in storage tanks and 230 in day tanks) is
available assuming in the unlikely event that one underground storage
30 | 3 tank is unavailable. Based on No. 2 diesel fuel oil with a minimum
19 density of 6.87 lbs/gallon and an average consumption rate of 0.382
30 | lbs/hp-Hr, this capacity is sufficient to operate two diesels at minimum
safeguards for at least 48 hours. An additional minimum on-site
storage of 26,300 gallons is necessary to ensure continuous operation of
two diesels at minimum safeguards load for a total of 168 hours. This
reserve is in addition to the storage requirements for other plants at
the site. Approximately 28,000 gallons of fuel oil is necessary to
operate two diesels for seven days to maintain the unit in a cooldown
condition concurrent with a loss of off-site power.

19 There are two 30,000 gallon Class III tanks located in the Indian Point Unit
No. 1 Superheater Building and a 200,000 gallon Class III tank in the
Buchanan Substation located immediately across Broadway. These tanks
contain fuel oil for operation of gas turbines that is compatible for use
with the diesels. Each tank has a level indicator and a capacity check
is made daily. When the gas turbines are being operated, the dispatcher
30 | 19 will be notified to start oil deliveries and to keep the tanks filled.
The gas turbines consume approximately 2000 gallons per turbine per hour.

30 | A truck with hose connections compatible with the underground storage tanks
will be provided. If the diesels require the reserves in these tanks, the contents
of these tanks would be transported by truck to the underground diesel storage tanks
Additional supplies of diesel oil are available locally. Under normal
conditions, 25,000 gallons can be delivered on a one or two-day notice.
Additional supplies are also maintained in the New Rochelle-Mount Vernon
area (about 40 miles from the plant) and are available for use during
emergencies, subject to extreme cold weather conditions (increased
domestic heating usage) and available transportation.

APPENDIX A

TO

FACILITY OPERATING LICENSE DPR-64

TECHNICAL SPECIFICATION AND BASES

FOR THE

INDIAN POINT NUCLEAR GENERATING UNIT NO. 3

WESTCHESTER COUNTY, NEW YORK

POWER AUTHORITY
OF THE STATE
OF NEW YORK

CONSOLIDATED EDISON
COMPANY OF
NEW YORK, INC.

DOCKET NO. 50-286

Date of Issuance: APR 5 1976

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3.7 AUXILIARY ELECTRICAL SYSTEMS

Applicability

Applies to the availability of electrical power for the operation of plant auxiliaries.

Objective

To define those conditions of electrical power availability necessary (1) to provide for safe reactor operation, and (2) to provide for the continuing availability of engineered safety features.

Specification

- A. The reactor shall not be brought above the cold shutdown condition unless the following requirements are met:
1. Two physically independent transmission circuits to Buchanan Substation capable of supplying engineered safeguards loads.
 2. 6.9 KV buses 5 and 6 energized from either 138 KV feeder 95331 or 95332.
 3. Either 13.8 KV feeder 13W92 or 13W93 and its associated 13.8/6.9 KV transformer available to supply 6.9 KV power.
 4. The four 480-volt buses 2A, 3A, 5A and 6A energized and the bus tie breakers between buses 5A and 2A, and between buses 3A and 6A, opened.
 5. Three diesel generators operable with a minimum onsite supply of 5676 gallons of fuel available in each of the three individual underground storage tanks and 26,300 gallons of fuel compatible for operation with the diesels available onsite other than the underground storage tanks or at the Buchanan substation. This 26,300 gallon reserve is for Indian Point Unit No. 3 usage only.

and is in addition to the fuel requirements for other nuclear units on the site.

6. Three batteries plus three chargers and the D. C. distribution systems operable.
 7. No more than one 120 volt A. C. Instrument Bus in the backup lighting supply.
- B. The requirements of 3.7.A may be modified to allow any one of the following power supplies to be inoperable at any one time:
1. One diesel or any diesel fuel oil system or a diesel and its associated fuel oil system may be inoperable for up to 7 days provided the 138 KV and the 13.8 KV sources of offsite power are available and the remaining diesel generators are tested daily to ensure operability and the engineered safety features associated with these diesel generator buses are operable.
 2. The 138 KV or the 13.8 KV sources of power may be inoperable for 48 hours provided the three diesel generators are operable. This operation may be extended beyond 48 hours provided the failure is reported to the NRC within the 48 hour period with an outline of the plans for restoration of offsite power and NRC approval is granted.
 3. One battery may be inoperable for 24 hours provided the other batteries and the three battery chargers remain operable with one battery charger carrying the D. C. load of the failed battery supply system.
- C. If the electrical distribution system is not restored to meet the requirements of 3.7.A within the time periods specified in 3.7.B, then:
1. If the reactor is critical, it shall be brought to the hot shutdown condition utilizing normal operating procedures. The shutdown shall start no later than at the end of the specified time period.

2. If the reactor is subcritical, the reactor coolant system temperature and pressure shall not be increased more than 25°F and 100 psi, respectively, over existing values.
3. In either case, if the requirements of 3.7.A are not satisfied within an additional 48 hours, the reactor shall be brought to the cold shutdown condition utilizing normal operating procedures. The shutdown shall start no later than the end of the 48 hour period.

D. The requirements of Specification 3.7.A.1 may be modified during an emergency system-wide blackout condition as follows:

Two of the three 13.8 KV feeders (13W92, 13W93 and/or 13W94) to the Buchanan Substation 138 KV buses operable with at least 37 MW power from any combination of gas turbines (nameplate rating at 80°F) at the Buchanan Substation and onsite available for exclusive use on Indian Point Unit No. 3.

E. Whenever the reactor critical, the circuit breaker on the electrical feeder to emergency lighting panel 318 inside containment shall be locked open except when containment access is required.

Basis

The electrical system equipment is arranged so that no single contingency can inactivate enough safeguards equipment to jeopardize the plant safety. The 480-volt equipment is arranged on 4 buses. The 6900-volt equipment is supplied from 6 buses.

The Buchanan Substation has both 345 KV and 138 KV transmission circuits which are capable of supplying startup, normal operation, shutdown and/or engineered safeguards loads.

The 138 KV supplies or the gas turbines are capable of providing sufficient power for plant startup. Power via the station auxiliary transformer can supply all the required plant auxiliaries during normal operation, if required.

In addition to the unit transformer, four separate sources supply station service power to the plant. (1)

The plant auxiliary equipment is arranged electrically so that multiple items receive their power from different buses. Redundant valves are individually supplied from separate motor control centers.

The bus arrangements specified for operation ensure that power is available to an adequate number of safeguards auxiliaries. With additional switching, more equipment could be out of service without infringing on safety.

Two diesel generators have sufficient capacity to start and run within design load the minimum required engineered safeguards equipment. ⁽¹⁾

The minimum onsite underground stored diesel fuel oil inventory is maintained at all times to assure the operation of two diesels carrying the minimum required engineered safeguards equipment load for at least 48 hours. ⁽²⁾

Additional fuel oil suitable for use in the diesel generators will be stored either on site or at the Buchanan Substation. The minimum storage of 26,300 gallons of additional fuel oil will assure continuous operation of two diesels at the minimum engineered safeguards load for a total of 7 days. A truck with hosing connections compatible with the underground diesel fuel oil storage tanks is available for transfer of diesel oil from storage areas either on site or at the Buchanan Substation. Commercial oil supplies and trucking facilities are also available.

Periodic diesel outages will be necessary to perform the corrective maintenance required as a result of previous tests or operations and the preventive maintenance recommended by the manufacturer.

One battery charger shall be in service on each battery so that the batteries will always be at full charge in anticipation of a loss-of-AC power incident. This insures that adequate D.C. power will be available for starting the emergency generators and other emergency uses.

The plant can be safely shutdown without the use of offsite power since all vital loads (safety systems, instruments, etc.) can be supplied from the emergency diesel generators.

Any two of three diesel generators, the station auxiliary transformer or the separate 13.8 to 6.9 KV transformer are each capable of supplying the minimum safeguards loads, and therefore provide separate sources of power immediately available for operation of these loads. Thus the power supply system meets the single failure criteria required of safety systems. To provide maximum assurance that the redundant or alternate power supplies will operate if required to do so, the redundant or alternate power supplies are verified operable prior to initiating repair of the inoperable power supply. If it develops that (a) the inoperable power supply is not repaired within the specified allowable time period, or (b) a second power supply in the same or related category is found to be inoperable, the reactor, if critical, will initially be brought to the hot shutdown condition utilizing normal operating procedures to provide for reduction of the decay heat from the fuel, and consequent reduction of cooling requirements after a postulated loss-of-coolant accident. If the reactor was already subcritical, the reactor coolant system temperature and pressure will be maintained within the stated values in order to limit the amount of stored energy in the Reactor Coolant System. The stated tolerances provide a band for operator control. After a limited time in hot shutdown, if the malfunction(s) are not corrected, the reactor will be brought to the cold shutdown condition, utilizing normal shutdown and cool-down procedures. In the cold shutdown condition there is no possibility of an accident that would release fission products or damage the fuel elements.

Conditions of a system-wide blackout could result in a unit trip. Since normal off-site power supplies as required in Specification 3.7.A.1 are not available for startup, it is necessary to be able to black start the unit with gas turbines providing the incoming power supplies as a first step in restoring the system to an operable status and restoring power to customers for essential services. Specification 3.7.C provides for startup using 37 MW's of gas turbine power (nameplate rating at 80°F) which is sufficient to carry out a normal plant startup. A system-wide blackout is deemed to exist when the majority of Con Edison electric generating facilities are shutdown due to an electrical disturbance and the remainder are incapable of supplying the system therefore necessitating major load shedding.

Since the backup lighting supply is stripped on safety injection, the requirement that not more than one 120 volt A. C. instrument bus be energized from the backup lighting supply is to assure minimum operable containment spray actuation channels.

As a result of an investigation of the effect components that might become submerged following a LOCA may have an ECCS, containment isolation and other safety-related functions, a fuse and a locked open circuit breaker were provided on the electrical feeder to emergency lighting panel 318 inside containment. With the circuit breaker in the open position, containment electrical penetration E-70 is de-energized during the accident condition. Personnel access to containment may be required during power operation. Since it is highly improbable that a LOCA would occur during this short period of time, the circuit breaker may be closed during that time to provide emergency lighting inside containment for personnel safety.

References

- 1) FSAR - Section 8.2.1
- 2) FSAR - Section 8.2.3