

Attachment I to JPN-96-004

**PROPOSED TECHNICAL SPECIFICATION CHANGES  
ASSOCIATED WITH EMERGENCY DIESEL GENERATORS SURVEILLANCE TESTING**

**New York Power Authority**

**JAMES A. FITZPATRICK NUCLEAR POWER PLANT  
Docket No. 50-333  
DPR-59**

9601300270 960125  
PDR ADOCK 05000333  
P PDR

3.9 (cont'd)

B. Emergency A-C Power System

The availability of electric power shall be as specified in 3.9.A, except as specified in 3.9.B.1, 3.9.B.2, 3.9.B.3, 3.9.B.4, and 3.9.B.5, except when the reactor is in the cold condition:

1. From and after the time that incoming power is available from only one line or through only one reserve station service transformer, continued reactor operation is permissible for a period not to exceed 7 days unless the line or reserve transformer is made operable earlier provided that during such 7 days both Emergency Diesel Generator Systems are operable. At the end of the 7th day, if the condition still exists, the reactor shall be placed in a cold condition within 24 hours.
2. From and after the time that incoming power is not available from any line or through either reserve station transformer, continued reactor operation is permissible for a period not to exceed 7 days, provided that both redundant Emergency Diesel Generator Systems are operable, all core and containment cooling systems are operable and the shutdown cooling systems are operable. At the end of the seventh day, if the condition still exists, the Reactor shall be placed in a cold condition within 24 hours.

4.9 (cont'd)

B. Emergency A-C Power System

1. Once each month, each pair of diesel generators which forms a redundant Emergency Diesel Generator System shall be manually initiated to demonstrate its ability to start, accelerate, and force parallel; after connection to the bus, the paralleled pair will be loaded to 5,200 KW, this load will be maintained until both generators are at steady state temperature conditions. During this period the generators' load sharing capability will be checked.
2. Once per month the diesel starting air compressors shall be checked for proper operation and their ability to recharge air receivers.

JAFNPP

3.9 (cont'd)

3. From and after the time that both individual diesel generators within one of the Emergency Diesel Generator Systems are made or found to be inoperable, continued reactor operation is permissible for a period not to exceed 7 days provided that the two incoming power sources are available and that the remaining Emergency Diesel Generator System is operable. At the end of the 7 day period, the reactor shall be placed in a cold condition within 24 hours, unless an individual diesel generator within the Emergency Diesel Generator System or the affected Emergency Diesel Generator System is made operable sooner.
4. When both Emergency Diesel Generator Systems are made or found to be inoperable restore at least one system to operable status within two hours or place the reactor in the cold condition within the following 24 hours.
5. From and after the time that one of the individual diesel generators in an Emergency Diesel Generator System is made or found to be inoperable, continued reactor operation is permissible for a period not to exceed 14 days provided that the two incoming power sources are available and that the three remaining diesel generators are operable. At the end of the 14 day period, the reactor shall be placed in a cold condition within 24 hours, unless the affected diesel generator is made operable sooner.

4.9 (cont'd)

3. The emergency diesel generator system instrumentation shall be checked during the monthly generator test.
4. Once each operating cycle, the conditions under which the Emergency Diesel Generator System is required will be simulated to demonstrate that the pair of diesel generators will start, accelerate, force parallel, and accept the emergency loads in the prescribed sequence.
5. While the reactor is being operated in accordance with Specification 3.9.B.3 or 3.9.B.5, the availability of the operable diesel generators shall be demonstrated once within 8 hours by manual starting and force paralleling.\* The operability of the remaining diesel generators need not be demonstrated if the affected diesel generator or Emergency Diesel Generator System became inoperable due to:
  - a. Preplanned preventive maintenance or testing.
  - b. An inoperable support system with no potential common mode failure for the remaining diesel generators, or
  - c. An independently testable component with no potential common mode failure for the remaining diesel generators.

\* Force paralleling only applies to the Emergency Diesel Generator System with two operable diesel generators.

JAFNPP

3.9 Continued

4.9 Continued

C. Diesel Fuel

There will be a minimum of 64,000 gal. of diesel fuel on site for each operable pair of diesel generators.

1. From and after the time that fuel oil storage tank level instrumentation is made or found to be inoperable for any reason continued reactor operation is permissible indefinitely, provided that the level in the affected storage tank is manually measured at least once/day.

6. Once within one hour and at least once per eight hours thereafter, while the reactor is being operated in accordance with Specifications 3.9.B.1, 3.9.B.3, 3.9.B.4, and 3.9.B.5, the availability of off-site power shall be assured by verifying correct breaker alignment and by verifying that the associated off-site electrical line is energized.

C. Diesel Fuel

Once a month the quantity of diesel fuel available in each storage tank shall be manually measured and compared to the reading of the local level indicators to ensure the proper operation thereof.

1. Once a month a sample of the diesel fuel in each storage tank shall be checked for quality as per the following:

Flash Point - °F	125°F min.
Pour Point - °F	10°F max.
Water & Sediment	0.05% max.
Ash	0.01% max.
Distillation 90% Point	540 min.
Viscosity (SSU) at 100°F	40 max.
Sulfur	1% max.
Copper Strip Corrosion	No. 3 max.
Cetane #	35 min.

## 3.9 (cont'd)

- c. From and after the time that only one fuel oil transfer pump in a Diesel Generator System is found to be operable, that Diesel Generator System shall be considered inoperable and continued reactor operation shall be in accordance with Specification 3.9.B.3 above.

3. Whenever the diesel fuel on site for each operable pair of Diesel Generators decreases to less than 64,000 gallons as a result of operation of the Diesel Generators "to meet Technical Specification requirements," Specification 3.0.C does not apply. 48 hours are allowed to restore fuel oil storage tank quantity to a minimum of 64,000 gallons.

D. AC Power Operability During Cold Shutdown or Refueling Modes

Whenever the reactor is in the cold shutdown or refueling mode, a minimum of one offsite power source and one individual diesel generator, and all its associated emergency equipment, shall be operable whenever any work is being done which has the potential for draining the vessel, secondary containment is required, or a core or containment cooling system is required. When this condition is not met, initiate actions to suspend all work that could cause draining of the vessel, suspend core alterations and handling of irradiated fuel assemblies in the secondary containment, declare required core or containment cooling systems inoperable and immediately initiate actions to restore required AC power sources.

## 4.9 (cont'd)

D. Not Applicable

## JAFNPP

### 3.9 BASES (cont'd)

If one of the individual diesel generators in an Emergency Diesel Generator System is not operable, the plant shall be permitted to operate at power for 14 days provided both sources of reserve power are operable. If one of the Emergency Diesel Generator Systems is not operable the plant shall be permitted to operate for 7 days provided both sources of reserve power are operable. This is based on the following:

1. If one of the individual diesel generators in an Emergency Diesel Generator System is not operable, the three remaining diesel generators are capable of carrying sufficient engineered safeguards and emergency core cooling system loads (two core spray systems and at least one RHR pump) to mitigate all loss-of-coolant accidents.
2. If one Emergency Diesel Generator System is not operable, the remaining Emergency Diesel Generator System is capable of carrying sufficient engineered safeguards and emergency core cooling system loads (at least one core spray system and one RHR pump) to mitigate all loss-of-coolant accidents.
3. The reserve (offsite) power is highly reliable.

#### C. Diesel Fuel

Minimum on-site fuel oil requirements are based on operation of the emergency diesel generator systems at rated load for 7 days.

Additional diesel fuel can be delivered to the site within 48 hours.

#### D. AC Power Operability During Cold Shutdown or Refueling Modes

One offsite power source and one diesel generator ensure the availability of the required power to recover from postulated events when in the cold shutdown or refueling modes and when handling irradiated fuel.

#### E. Battery System

125 v DC power is supplied from two plant batteries each sized to supply the required equipment at design power following a loss-of-coolant accident with a concurrent loss of normal and reserve power. Each battery is provided with a charger sized to maintain the battery in a fully charged state while supplying normal operating loads.

#### F. LPCI MOV Independent Power Supplies

There are two LPCI MOV Independent Power Supplies each consisting of a charger, rectifier, inverter and battery. Each independent power supply charger-rectifier is normally fed from the emergency A-C power supply system to maintain the battery in a fully charged state. In the event of a LOCA each independent power supply is automatically isolated from the Emergency A-C power system. The battery and inverter have sufficient capacity to power the MOV's essential to the operation of the LPCI System. An alternate power source is provided for each LPCI MOV bus whereby in the event its independent power supply is out of service, the LPCI MOV bus may be energized directly from the Emergency A-C Power System.

Attachment II to JPN-96-004

**SAFETY EVALUATION FOR  
PROPOSED TECHNICAL SPECIFICATION CHANGES  
ASSOCIATED WITH EMERGENCY DIESEL GENERATORS**

New York Power Authority

**JAMES A. FITZPATRICK NUCLEAR POWER PLANT  
Docket No. 50-333**

**SAFETY EVALUATION  
PROPOSED TECHNICAL SPECIFICATION CHANGES  
ASSOCIATED WITH EMERGENCY DIESEL GENERATORS**

**I. DESCRIPTION OF THE PROPOSED CHANGES**

This application for amendment to the James A. FitzPatrick (JAF) Technical Specifications (TSs) proposes revisions to selected Emergency Diesel Generators (EDGs) limiting conditions for operation and surveillance requirements. This amendment application proposes to revise the Allowed Out of Service Times (AOTs) for single inoperable EDGs to accommodate on-line EDG maintenance. In addition, this amendment application implements the guidance provided by the NRC in Generic Letter 93-05 (Reference 1) for EDG testing at power and makes the JAF TS consistent with the Standard Technical Specifications (Reference 2) by revising the AC power requirements during cold shutdown or refueling modes.

1. **Page 216, Specification 3.9.B** Change the following from:

"as specified in 3.9.B.1, 3.9.B.2, 3.9.B.3, and 3.9.B.4, "

to:

"as specified in 3.9.B.1, 3.9.B.2, 3.9.B.3, 3.9 B.4, and 3.9.B.5,"

2. **Page 217, Specification 3.9.B.3** Change the following from:

"From and after the time that one of the Emergency Diesel Generator Systems is made or found to be inoperable, continued reactor operation is permissible for a period not to exceed 7 days provided that the two incoming power sources are available and that the remaining Diesel Generator System is operable. At the end of the 7 day period, the reactor shall be placed in a cold condition within 24 hours, unless the affected diesel generator system is made operable sooner."

to:

"From and after the time that both individual diesel generators within one of the Emergency Diesel Generator Systems are made or found to be inoperable, continued reactor operation is permissible for a period not to exceed 7 days provided that the two incoming power sources are available and that the remaining Emergency Diesel Generator System is operable. At the end of the 7 day period, the reactor shall be placed in a cold condition within 24 hours, unless an individual diesel generator within the Emergency Diesel Generator System or the affected Emergency Diesel Generator System is made operable sooner."

**SAFETY EVALUATION**

3. **Page 217, Add new Specification 3.9.B.5,** The new Specification reads:

"5. From and after the time that one of the individual diesel generators in an Emergency Diesel Generator System is made or found to be inoperable, continued reactor operation is permissible for a period not to exceed 14 days provided that the two incoming power sources are available and that the three remaining diesel generators are operable. At the end of the 14 day period, the reactor shall be placed in a cold condition within 24 hours, unless the affected diesel generator is made operable sooner."

4. **Page 218, Specification 4.9.B.6,** Change the following from:

" while the reactor is being operated in accordance with Specifications 3.9.B.1, 3.9.B.3, and 3.9.B.4,"

to:

" while the reactor is being operated in accordance with Specifications 3.9.B.1, 3.9.B.3, 3.9.B.4, and 3.9.B.5,"

5. **Page 224, Bases 3.9.C** Move paragraph relating to EDG LCO from 3.9.C Bases to Bases 3.9.B and change the following from:

"If one of the Emergency Diesel Generator Systems is not operable, the plant shall be permitted to run for 7 days provided both sources of reserve power are operational. This is based on the following:

1. The operable Emergency Diesel Generator System is capable of carrying sufficient engineered safeguards and emergency core cooling system equipment to cover all loss-of-coolant accidents.
2. The reserve (offsite) power is highly reliable."

to:

"If one of the individual diesel generators in an Emergency Diesel Generator System is not operable, the plant shall be permitted to operate at power for 14 days provided both sources of reserve power are operable. If one of the Emergency Diesel Generator Systems is not operable the plant shall be permitted to operate for 7 days provided both sources of reserve power are operable. This is based on the following:

1. If one of the individual diesel generators in an Emergency Diesel Generator System is not operable, the remaining three diesel generators are capable of carrying sufficient engineered safeguards and emergency core cooling system loads (two core spray systems and at least one RHR pump) to mitigate all loss-of-coolant accidents.

**SAFETY EVALUATION**

2. If one Emergency Diesel Generator System is not operable, the remaining Emergency Diesel Generator System is capable of carrying sufficient engineered safeguards and emergency core cooling system loads (at least one core spray system and one RHR pump) to mitigate all loss-of-coolant accidents.
  3. The reserve (offsite) power is highly reliable."
6. **Page 220, Specification 3.9.D** Change the following from:

**"Diesel Generator Operability**

Whenever the reactor is in the cold shutdown or refueling modes, a minimum of one of the pairs of Emergency Diesel Generators, and all its associated emergency equipment shall be operable whenever any work is being done which has the potential for draining the vessel, secondary containment is required, or a core or containment cooling system is required."

to:

**"D. AC Power Operability During Cold Shutdown or Refueling Modes**

Whenever the reactor is in the cold shutdown or refueling mode, a minimum of one offsite power source and one individual diesel generator, and all its associated emergency equipment, shall be operable whenever any work is being done which has the potential for draining the vessel, secondary containment is required, or a core or containment cooling system is required. When this condition is not met, initiate actions to suspend all work that could cause draining of the vessel, suspend core alterations and handling of irradiated fuel assemblies in the secondary containment, declare required core or containment cooling systems inoperable and immediately initiate actions to restore required AC power sources."

7. **Page 224, Bases 3.9.D** Add the following bases:

**"AC Power Operability During Cold Shutdown or Refueling Modes**

One offsite power source and one diesel generator ensure the availability of the required power to recover from postulated events when in the cold shutdown or refueling modes and when handling irradiated fuel."

**SAFETY EVALUATION**

8. **Page 217, Specification 4.9.B.5** Replace the following:

"Once within one hour and at least once per twenty-four hours thereafter while the reactor is being operated in accordance with Specifications 3.9.B.1, 3.9.B.2, or 3.9.B.3 the availability of the operable Emergency Diesel Generators shall be demonstrated by manual starting and force paralleling where applicable."

with:

"While the reactor is being operated in accordance with Specification 3.9.B.3 or 3.9.B.5, the availability of the operable diesel generators shall be demonstrated once within 8 hours by manual starting and force paralleling.\* The operability of the remaining diesel generators need not be demonstrated if the affected diesel generator or Emergency Diesel Generator System became inoperable due to:

- a. Preplanned preventive maintenance or testing.
- b. An inoperable support system with no potential common mode failure for the remaining diesel generators, or
- c. An independently testable component with no potential common mode failure for the remaining diesel generators.

\* Force paralleling only applies to the Emergency Diesel Generator System with two operable diesel generators."

**II. PURPOSE OF THE PROPOSED CHANGES**

The purpose of these TS changes is to provide an AOT for repair and maintenance of individual EDGs, implement the guidance contained in Generic Letter 93-05 (Reference 1) for testing of EDGs at power, and make the LCO requirements for AC power sources during shutdown modes consistent with the NRC Improved Standard Technical Specifications for BWR 4 plants (Reference 2).

**SAFETY EVALUATION**

The Authority plans to adopt the proposed TS improvements for the following reasons:

a. **EMERGENCY DIESEL GENERATOR LCO AT POWER**

The purpose of the proposed TS changes to extend AOTs for inoperable single EDGs is to provide increased flexibility in scheduling maintenance activities (including on-line EDG maintenance) and to avoid potential unnecessary plant shutdown caused by the shorter AOTs. Current plant maintenance procedures require periodic inspections of individual EDGs in accordance with manufacturer's recommendations. Normally these maintenance inspections have been performed during plant outages with other plant maintenance activities competing for resources and schedule. This practice allows very little flexibility in scheduling the maintenance inspections on a more optimum schedule (e.g., staggered on-line inspections) based on the actual performance of the units.

TS Section 3.9.B.3 currently allows an EDG System to be taken out of service for repair or maintenance for a period up to 7 days. This LCO applies when either a single EDG or both EDGs within an Emergency Diesel Generator System are inoperable. The condition when both EDGs within a system are inoperable establishes the bounding 7 day AOT. There are no provisions within the existing TSs for a longer AOT for a single inoperable EDG within a System. This TS change would allow a single EDG within an Emergency Diesel Generator System to be taken out of service for a period of up to 14 days to perform required repair or maintenance during power operation.

The proposed EDG AOT changes to the technical specifications are supported by existing designed redundancy in the EDG Systems, Accident Analyses, and risk results from the quantification runs performed in accordance with the PSA Application Guide (Reference 3). This change is also consistent with other NRC approvals relating to EDG AOT extensions (reference SER dated September 28, 1989, for the Philadelphia Electric Company's (PECO) Limerick Generating Station, SER dated August 16, 1995, for the PECO Peach Bottom Generating Station and SER dated August 1, 1995, for the Public Service Electric & Gas Company's Hope Creek Generating Station).

b. **EMERGENCY DIESEL GENERATOR LCO DURING PLANT SHUTDOWN**

TS Section 3.9.D currently requires a minimum of one of the pairs of EDGs during cold shutdown or refueling modes. This TS amendment changes the minimum number of required EDGs during these modes of operation to one offsite power source and one EDG. This change makes the FitzPatrick Technical Specifications consistent with Section 3.8.2 of the NRC Improved Standard Technical Specifications for BWR 4 plants (Reference 2). A single operable EDG or the required operable offsite power source is adequate to assure power for systems required to recover from an inadvertent draindown of the vessel or a fuel handling accident.

**SAFETY EVALUATION**c. **EMERGENCY DIESEL GENERATOR SURVEILLANCE AT POWER OPERATION**

TS Section 4.9.B.5 currently requires testing of both Emergency Diesel Generator Systems once within one hour and at least once per 24 hours thereafter when incoming power from one or both offsite reserve station transformers is determined to be inoperable. The proposed change would eliminate this testing requirement. The alternate testing of the EDG Systems when the offsite reserve station transformers are unavailable results in an increased potential for an EDG System to become unavailable at the time when its potential for required use is the highest.

TS Section 4.9.B.5 also requires testing of the remaining operable EDG system once within one hour and at least once per 24 hours thereafter when one EDG System is found to be inoperable. The proposed change would eliminate this testing requirement if the inoperability is determined to be due to an inoperable support system, an independently testable component, preplanned preventive maintenance or testing, or if the absence of any potential common mode failure for the remaining EDGs or EDG System is demonstrated. The proposed specification would also change the current completion time from "once within one hour and at least once per 24 hours thereafter" to once "within 8 hours" for testing the remaining operable EDGs. The current testing of the redundant EDGs when an EDG or EDG System is inoperable for a reason that does not impact the remaining operable EDGs, increases the potential for the remaining operable EDGs to become unavailable at a time when their potential for required use is the highest. These testing requirements are consistent with NRC recommendations based on the NRC comprehensive review of EDG surveillance testing referenced in Generic Letter 93-05.

**SAFETY EVALUATION****III. SAFETY IMPLICATIONS OF THE PROPOSED CHANGES****a. EMERGENCY DIESEL GENERATOR LCO AT POWER**

The proposed 14 day AOT for a single EDG does not have an adverse affect on plant safety based on designed redundancy of the Emergency AC power systems. The FitzPatrick Accident Analyses indicate that the proposed AOT for a single EDG are bounded by existing analyses for EDG Systems with adequate margins retained. In addition, the risks associated with a single EDG out of service are acceptably low. The following is a discussion of the Emergency AC power system configuration, Accident Analyses and quantitative evaluation considering the condition of an EDG out of service.

**1. FitzPatrick Emergency AC Power System Configuration and Accident Analyses Considering an EDG Out of Service**

The configuration of the Emergency AC Power System is illustrated in Table 1. There are two EDG Systems, each being composed of two EDGs connected to an AC emergency bus. Each Bus supplies power to a Core Spray (CS) pump and two Residual Heat Removal (RHR) pumps, with an RHR pump in each loop for Low Pressure Coolant Injection (LPCI). If a single EDG is lost on a Bus during a Loss of Offsite Power (LOOP) event, then one RHR pump (pump "B" on Bus 10500 and pump "C" on Bus 10600) does not auto start on a LOCA signal. The unavailability of the one EDG does not disable the entire associated AC Bus, but results in one less RHR pump for the LPCI mode being automatically started upon the occurrence of a LOCA signal. Therefore, from the standpoint of ECCS operability, the unavailability of one EDG during a LOOP event is similar to the unavailability of one RHR pump in the LPCI mode, which has minimal impact on LOCA mitigation capability since the LPCI system was originally designed with sufficient flow rate margin to accommodate the potential failure of one RHR pump. Furthermore, the RHR system configuration is such that long term suppression pool and reactor shutdown cooling can be provided with any one of the four RHR pumps. The significance of this is that suppression pool cooling will always be available during a LOOP event even if only one of the four EDGs were available. This is a high degree of redundancy compared to the typical BWR.

**SAFETY EVALUATION**

LOCA Analyses for the FitzPatrick plant, NEDC-31317 P (Reference 4), demonstrate that all Appendix K regulatory requirements are met with one Core Spray pump and one RHR pump in the low pressure coolant injection mode injecting coolant into the vessel or two CS systems and no LPCI pumps. Therefore, taking any one EDG out of service does not render an entire EDG System inoperable and does not result in a more limiting combination of ECCS systems available than the limiting licensing basis LOCA scenario. Based on this evaluation, operation with one EDG out of service is of significantly less consequence than operation with the entire EDG System out of service. Furthermore, the failure of a second EDG in the remaining EDG System is less limiting than the failure of two EDGs in a single EDG System.

**SAFETY EVALUATION**Table 1FitzPatrick Emergency Diesel Generator Configuration

	<u>LPCI Loop A</u>		<u>LPCI Loop B</u>		<u>Core Spray</u>	
	<u>Pump A</u>	<u>Pump C</u>	<u>Pump B</u>	<u>Pump D</u>	<u>CS A</u>	<u>CS B</u>
<u>EDG System A</u> ( <u>Bus 10500</u> ) EDG A or EDG C	X		X		X	
<u>EDG System B</u> ( <u>Bus 10600</u> ) EDG B or EDG D		X		X		X

<b>Assumed Out of Service with Loss of Offsite Power</b>	<b>Available ECCS Systems Assuming No Additional Single Failure During LCO</b>	
	<b>Recirc. Discharge Line A Break</b>	<b>Recirc. Discharge Line B Break</b>
	EDG System A (Both EDGs)	LPCI - D CS B
EDG System B (Both EDGs)	LPCI - B CS A	LPCI - A CS A
EDG A or EDG C	LPCI - D CS A CS B	LPCI - A LPCI - C CS A CS B
EDG B or EDG D	LPCI - B LPCI - D CS A CS B	LPCI - A CS A CS B

--- If either EDG A or EDG C on Bus 10500 is lost during a LOOP event, then  
LPCI - B does not auto start.

--- If either EDG B or EDG D on Bus 10600 is lost during a LOOP event, then  
LPCI - C does not auto start.

**SAFETY EVALUATION****2. Quantitative Evaluation of an EDG Out of Service**

A quantitative analysis was performed to determine the potential increase in risk resulting from a single EDG outage of 14 days during power operation. Four individual quantification runs were performed for each of the EDGs. Using models from the JAF Individual Plant Examination (IPE) (Reference 5); the core damage frequency (CDF) was calculated assuming a single EDG was removed from service. It was assumed that no maintenance would be allowed on the remaining three EDGs. In addition, the common cause failure potential for all four EDGs as well as the common cause failure potential of two EDGs in the affected Division were removed from the model to reflect the actual change in configuration during the AOT.

The resulting conditional CDF values assuming a single EDG is taken out of service for maintenance are presented in Table 2. The percent increase in CDF from the baseline is also given in the Table. The baseline CDF from the JAF IPE is  $1.5 \text{ E-06}$  per year. The risk for a single AOT event ( $r$ ) is calculated as follows:

$$r = \Delta R * d$$

where  $d$  is the AOT duration (in years) and  $\Delta R$  is the increase in CDF from the baseline value.

It can be seen from Table 2 that the increase in CDF from the baseline with a single EDG out of service is  $8.0 \text{ E-08}$  per year representing a 5.33 % increase from the baseline for each of the four EDGs. The single event risk ( $r$ ) for an AOT of 14 days is  $3.07 \text{ E-09}$ . These values are well below the screening criteria for risk significance given in Reference 3. It can therefore be concluded that the risk associated with taking a single EDG out of service for a period of 14 days to perform repair or maintenance during power operation is non-risk-significant.

**SAFETY EVALUATION**

Table 2

**Risk Evaluation for EDG 14 Day AOT**

EDG	Resultant CDF per Year	Percent CDF Increase from Base	$\Delta R$ per Year	Single Event AOT Risk ( r ) for 14 Days
A	1.58 E -06	5.33 %	8.00 E -08	3.07 E -09
B	1.58 E -06	5.33 %	8.00 E -08	3.07 E -09
C	1.58 E -06	5.33 %	8.00 E -08	3.07 E -09
D	1.58 E -06	5.33 %	8.00 E -08	3.07 E -09

**3. Planned Conditions to Support On-Line EDG Maintenance**

The Authority has administrative controls governing maintenance during LCOs and requirements for documenting entry into, and exit from TS LCOs. The Authority plans to satisfy the following conditions to support a 14-day AOT for individual EDGs:

- a. The Authority will verify through TS, procedures, or detailed analysis that the required systems, subsystems, trains, components, and devices that are required to mitigate the consequences of an accident are available and operable before removing an EDG for extended preventive maintenance (PM). In addition, controls will be provided to preclude subsequent testing or maintenance activities on these systems, subsystems, trains, components, and devices while the EDG is inoperable.
- b. When an individual EDG is removed from service for an extended 14-day AOT, the three remaining EDGs must be operable and available to mitigate the consequences of a LOOP condition.
- c. The removal from service of safety systems and important non-safety equipment, including offsite power sources, will be minimized during the extended 14-day AOT.

**SAFETY EVALUATION**

- d. Entry into this 14-day LCO action statement will not be abused by repeated voluntary entry into and exit from the LCO. The primary intent of extending the EDG AOT is that the extended EDG AOT from 7 days to 14 days may be needed to perform preplanned EDG maintenance such as teardowns and modifications that would otherwise extend beyond the current 7 day AOT.
- e. Voluntary entry into this LCO action statement will not be scheduled if severe weather conditions are expected which could affect the reliability of the offsite power sources.
- f. The overall unavailability of the EDG should not exceed the value that was used in the JAF IPE supporting the proposed AOT.
- g. Any component testing or maintenance that increases the likelihood of a plant transient should be avoided. Plant operation should be stable during the extended 14-day AOT.

b. **EMERGENCY DIESEL GENERATOR LCO DURING PLANT SHUTDOWN**

The proposed change provides diversity by requiring a highly reliable offsite power source which is described in Section 7.7 of the safety evaluation (Reference 6). The reduction of the number of EDGs required during shutdown does not significantly increase the risk related to inadvertent draindown of the vessel or a fuel handling accident. The basis for this change is consistent with the basis established for the BWR 4 Standard Technical Specification, that is, one offsite power source and one EDG are required to be operable during shutdown.

**SAFETY EVALUATION****c. EMERGENCY DIESEL GENERATOR SURVEILLANCE AT POWER OPERATION**

The proposed changes do not have an adverse affect on plant safety. The surveillance requirements in the Technical Specifications are performed to ensure that equipment is operable or to discover inoperable equipment so that it can be restored to operable status. Performing more tests than are necessary, or performing ineffective tests of EDGs can result in excessive wear to equipment. If an EDG or EDG System should become inoperable for any reason other than preplanned preventive maintenance or a condition where it has been determined there is no potential for common mode failure for the remaining EDGs or EDG System, the proposed TS revision provides for testing of the remaining EDGs within 8 hours. This proposed test schedule is considered adequate to ensure that the inoperable condition is not due to a common cause failure and that additional testing during periods when the EDG or EDG System is inoperable is minimized.

**IV. EVALUATION OF SIGNIFICANT HAZARDS CONSIDERATION**

Operation of the FitzPatrick plant in accordance with the proposed Amendment would not involve a significant hazards consideration as defined in 10 CFR 50.92, since it would not:

1. involve a significant increase in the probability or consequences of an accident previously evaluated.

**a. EMERGENCY DIESEL GENERATOR LCO AT POWER**

The proposed changes to the Technical Specifications will allow longer Allowed Out of Service Times to perform necessary repair and maintenance on individual Emergency Diesel Generators while at power. This extended AOT will enhance scheduling of preventive maintenance of individual EDGs without significantly increasing the probability or consequences of an accident previously evaluated. The risk evaluations contained in the JAF quantitative analyses of the EDGs determined that the probability of an accident by increasing the AOT for an individual EDG from 7 days to 14 days is non-risk-significant. The primary reason for this low relative risk is due to the designed redundancy and capability to respond to an accident when a single diesel generator is out of service. LOCA Analyses that assume the worst case line break while an EDG is out of service indicate the

**SAFETY EVALUATION**

plant can be safely shut down with the remaining EDGs. Even if another EDG should fail during the AOT, at least one Core Spray and one Residual Heat Removal (RHR) Low Pressure Coolant Injection pump can provide the required flow to bring the plant to safe shut down. Furthermore, long term suppression pool and reactor shutdown cooling is provided by any one of the three remaining RHR pumps for a single EDG out of service or by two remaining RHR pumps assuming an additional EDG failure during the AOT.

Increasing the EDG AOT does not involve physical alteration of any plant equipment and does not affect analysis assumptions regarding functioning of required equipment designed to mitigate the consequences of accidents. Further, the severity of postulated accidents and resulting radiological effluent releases will not be affected by the increased AOT for a single EDG.

Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

b. **EMERGENCY DIESEL GENERATOR LCO DURING PLANT SHUTDOWN**

Changing the number of EDGs required during plant shutdown does not involve physical alteration of any plant equipment and does not affect analysis assumptions regarding functioning of required equipment designed to mitigate the consequences of accidents. Further, the severity of postulated accidents and resulting radiological effluent releases will not be affected by the change in the LCO during shutdown.

c. **EMERGENCY DIESEL GENERATOR SURVEILLANCE AT POWER OPERATION**

The proposed change to the Technical Specification will reduce the required number of tests to be performed when an EDG or EDG System is inoperable. This proposed change to TS requirements addresses the concern of excessive testing that could result in EDG wear which is counter-productive to safety in terms of equipment degradation and availability. This change is consistent with Generic Letter 93-05 guidance for implementing such recommendations. The proposed Technical Specifications will not result in a change to the design or operation of the facility, therefore, this change will not result in a significant increase in the probability or consequences of an accident previously evaluated.

2. create the possibility of a new or different kind of accident from any accident previously evaluated.

- a. **EMERGENCY DIESEL GENERATOR LCO AT POWER**

Extending the AOT for an individual EDG does not necessitate physical alteration of the plant or changes in parameters governing normal plant operation. Thus, this change does not create the possibility of a new or different kind of accident from any accident previously evaluated for JAF plant.

- b. **EMERGENCY DIESEL GENERATOR LCO DURING PLANT SHUTDOWN**

Changing the number of EDGs required during shutdown does not necessitate physical alteration of the plant or changes in parameters governing normal plant operation. Thus, this change does not create the possibility of a new or different kind of accident from any accident previously evaluated for JAF plant.

- c. **EMERGENCY DIESEL GENERATOR SURVEILLANCE AT POWER OPERATION**

The proposed change does not change design, operation or the testing process. The nature of this change precludes the possibility of a new or different kind of accident. The proposed change to complete the required action does not involve any hardware changes, nor changes to the operation of the equipment nor does it change the ability of the equipment to perform its intended function. Performing the testing on an extended time cannot initiate any type of accident.

3. involve a significant reduction in the margin of safety.

- a. **EMERGENCY DIESEL GENERATOR LCO AT POWER**

As discussed above, the JAF quantitative evaluation determined that the change in risk associated with extending the AOT for a single EDG is non-risk-significant. In addition, the design provides adequate redundancy for safe shut down during the AOT for a single EDG out of service. This is supported by the LOCA analyses including analyses for long term suppression pool and reactor shutdown cooling.

**SAFETY EVALUATION**

b. **EMERGENCY DIESEL GENERATOR LCO DURING PLANT SHUTDOWN**

The margin of safety is not affected by changing the number of EDGs required during shutdown. One offsite power source or one EDG ensure the availability of the required power to recover from postulated accident events during shutdown. When the required number of operable systems is not met, all work that could potentially initiate a postulated accident event during shutdown is suspended.

c. **EMERGENCY DIESEL GENERATOR SURVEILLANCE AT POWER OPERATION**

The proposed change to Technical Specifications reduces testing at reactor power. The overall effect is a net gain in plant safety by avoiding the potential for unnecessary wear that could degrade the EDGs at power. Implementation of these changes is consistent with the guidance provided by the NRC in Generic Letter 93-05. The proposed change to the EDG testing requirements does not reduce the ability of the equipment to perform its intended safety function.

V. **IMPLEMENTATION OF THE PROPOSED CHANGES**

Implementation of the proposed changes will not adversely affect the ALARA or Fire Protection Program at the FitzPatrick plant, nor will the changes impact the environment. These changes will not result in any new releases to the environment. The changes pose no radiological or fire hazards and, therefore, can have no impact on the Fire Protection Program or the environment.

VI. **CONCLUSION**

Based on the discussions above, the identified changes to the EDG requirements to accommodate on-line EDG maintenance, EDG testing at power, and revised shutdown emergency AC power requirements may be safely implemented.

The changes involve no significant hazards consideration, as defined in 10 CFR 50.92. The Plant Operating Review Committee (PORC) and the Safety Review Committee (SRC) have reviewed these proposed changes to the Technical Specifications and have concluded that they do not involve an unreviewed safety question, or a significant hazards consideration, and will not endanger the health and safety of the public.

**SAFETY EVALUATION**

**VII. REFERENCES**

1. NRC Generic Letter 93-05, "Line-item Technical Specifications Improvements to reduce Surveillance Requirements for Testing During Power Operation", dated September 27, 1993.
2. NRC NUREG-1433, "Standard Technical Specifications in General Electric Plants, BWR/4", Revision 1, April 1995.
3. EPRI TR-105396, "PSA Application Guide", Electric Power Research Institute, August 1995.
4. NEDC 31317P, Revision 2, "James A. FitzPatrick Nuclear Power Plant SAFER/GESTR-LOCA Loss-of-Coolant Accident Analysis", GE Nuclear Energy, April 1993.
5. James A. FitzPatrick Nuclear Power Plant Individual Plant Examination, August 1991
6. James A. FitzPatrick Nuclear Power Plant Safety Evaluation, November 1972, and Supplements February 1973 and October 1974

Attachment III to JPN-96-004

**PROPOSED TECHNICAL SPECIFICATION CHANGES  
ASSOCIATED WITH EMERGENCY DIESEL GENERATORS  
MARKUP OF TECHNICAL SPECIFICATION PAGES**

**New York Power Authority**

**JAMES A. FITZPATRICK NUCLEAR POWER PLANT**

Docket No. 50-333

DPR-59

3.9 (cont'd)

JAFNPP

4.9 (cont'd)

B. Emergency A-C Power System

The availability of electric power shall be as specified in 3.9.A, except as specified in 3.9.B.1, 3.9.B.2, 3.9.B.3, and 3.9.B.4, except when the reactor is in the cold condition.

3.9.B.4,

5

1. From and after the time that incoming power is available from only one line or through only one reserve station service transformer, continued reactor operation is permissible for a period not to exceed 7 days unless the line or reserve transformer is made operable earlier provided that during such 7 days both Emergency Diesel Generator Systems are operable. At the end of the 7th day, if the condition still exists, the reactor shall be placed in a cold condition within 24 hours.
2. From and after the time that incoming power is not available from any line or through either reserve station transformer, continued reactor operation is permissible for a period not to exceed 7 days, provided that both redundant Emergency Diesel Generator Systems are operable, all core and containment cooling systems are operable and the shutdown cooling systems are operable. At the end of the seventh day, if the condition still exists, the Reactor shall be placed in a cold condition within 24 hours.



B. Emergency A-C Power System

1. Once each month, each pair of diesel generators which forms a redundant Emergency Diesel Generator System shall be manually initiated to demonstrate its ability to start, accelerate, and force parallel; after connection to the bus, the paralleled pair will be loaded to 5,200 KW, this load will be maintained until both generators are at steady state temperature conditions. During this period the generators' load sharing capability will be checked.
2. Once per month the diesel starting air compressors shall be checked for proper operation and their ability to recharge air receivers.

3.9 (cont'd)

are

both individual diesel generators within

3. From and after the time that one of the Emergency Diesel Generator Systems is made or found to be inoperable, continued reactor operation is permissible for a period not to exceed 7 days provided that the two incoming power sources are available and that the remaining Diesel Generator System is operable. At the end of the 7 day period, the reactor shall be placed in a cold condition within 24 hours, unless the affected diesel generator system is made operable sooner.

4. When both Emergency Diesel Generator Systems are made or found to be inoperable restore at least one system to operable status within two hours or place the reactor in the cold condition within the following 24 hours.

5. Deleted

INSERT 1

INSERT 2

4.9 (cont'd)

3. The emergency diesel generator system instrumentation shall be checked during the monthly generator test.

4. Once each operating cycle, the conditions under which the Emergency Diesel Generator System is required will be simulated to demonstrate that the pair of diesel generators will start, accelerate, force parallel, and accept the emergency loads in the prescribed sequence.

5. Once within one hour and at least once per twenty-four hours thereafter while the reactor is being operated in accordance with Specifications 3.9.B.1, 3.9.B.2, or 3.9.B.3 the availability of the operable Emergency Diesel Generators shall be demonstrated by manual starting and force paralleling where applicable.

Delete

Emergency

Emergency Diesel Generator System

an individual diesel generator within the Emergency Diesel Generator System or

JAFNPP

3.9 Continued

C. Diesel Fuel

There will be a minimum of 64,000 gal. of diesel fuel on site for each operable pair of diesel generators.

1. From and after the time that fuel oil storage tank level instrumentation is made or found to be inoperable for any reason continued reactor operation is permissible indefinitely, provided that the level in the affected storage tank is manually measured at least once/day.

4.9 Continued

3.9.6.4

6. Once within one hour and at least once per eight hours thereafter, while the reactor is being operated in accordance with Specifications 3.9.B.1, 3.9.B.3 and 3.9.B.4, the availability of off-site power shall be assured by verifying correct breaker alignment and by verifying that the associated off-site electrical line is energized.

C. Diesel Fuel

Once a month the quantity of diesel fuel available in each storage tank shall be manually measured and compared to the reading of the local level indicators to ensure the proper operation thereof.

1. Once a month a sample of the diesel fuel in each storage tank shall be checked for quality as per the following:

Flash Point - °F	125°F min.
Pour Point - °F	10°F max.
Water & Sediment	0.05% max.
Ash	0.01% max.
Distillation 90% Point	30 min.
Viscosity (SSU) at 100°F	40 max.
Sulfur	1% max.
Copper Strip Corrosion	No. 3 max.
Cetane #	35 min.

3.9 Continued

- c. From and after the time that only one fuel oil transfer pump in a Diesel Generator System is found to be operable, that Diesel Generator System shall be considered inoperable and continued reactor operation shall be in accordance with Specification 3.9.B.3 above.

- 3. Whenever the diesel fuel on site for each operable pair of Diesel Generators decreases to less than 64,000 gallons as a result of operation of the Diesel Generators "to meet Technical Specification requirements," Specification 3.0.C does not apply. 48 hours are allowed to restore fuel oil storage tank quantity to a minimum of 64,000 gallons.



4.9 continued

D. ~~Diesel Generator Operability~~

~~Whenever the reactor is in the cold shutdown or refueling modes, a minimum of one of the pairs of Emergency Diesel Generators, and all its associated emergency equipment shall be operable whenever any work is being done which has the potential for draining the vessel, secondary containment is required, or a core or containment cooling system is required.~~

DELETE

INSERT 3

D. Not Applicable

3.9 BASES (cont'd)

INSERT 4

C. Diesel Fuel

Minimum on-site fuel oil requirements are based on operation of the emergency diesel generator systems at rated load for 7 days.

Additional diesel fuel can be delivered to the site within 48 hours.

~~If one of the Emergency Diesel Generator Systems is not operable, the plant shall be permitted to run for 7 days provided both sources of reserve power are operational. This is based on the following:~~

- ~~1. The operable Emergency Diesel Generator System is capable of carrying sufficient engineered safeguards and emergency core cooling system equipment to cover all loss-of-coolant accidents.~~
- ~~2. The reserve (offsite) power is highly reliable.~~

D. Not Used

INSERT 5

Delete

E. Battery System

125 v DC power is supplied from two plant batteries each sized to supply the required equipment at design power following a loss-of-coolant accident with a concurrent loss of normal and reserve power. Each battery is provided with a charger sized to maintain the battery in a fully charged state while supplying normal operating loads.

F. LPCI MOV Independent Power Supplies

There are two LPCI MOV Independent Power Supplies each consisting of a charger, rectifier, inverter and battery. Each independent power supply charger-rectifier is normally fed from the emergency A-C power supply system to maintain the battery in a fully charged state. In the event of a LOCA each independent power supply is automatically isolated from the Emergency A-C power system. The battery and inverter have sufficient capacity to power the MOV's essential to the operation of the LPCI System. An alternate power source is provided for each LPCI MOV bus whereby in the event its independent power supply is out of service, the LPCI MOV bus may be energized directly from the Emergency A-C Power System.

**MARKUP OF TECHNICAL SPECIFICATION PAGES**

**INSERTS  
(Pg. 1 of 2)**

**Insert 1**

From and after the time that one of the individual diesel generators in an Emergency Diesel Generator System is made or found to be inoperable, continued reactor operation is permissible for a period not to exceed 14 days provided that the two incoming power sources are available and that the three remaining diesel generators are operable. At the end of the 14 day period, the reactor shall be placed in a cold condition within 24 hours, unless the affected diesel generator is made operable sooner.

**Insert 2**

While the reactor is being operated in accordance with Specification 3.9.B.3 or 3.9.B.5, the availability of the operable diesel generators shall be demonstrated once within 8 hours by manual starting and force paralleling.\* The operability of the remaining diesel generators need not be demonstrated if the affected diesel generator or Emergency Diesel Generator System became inoperable due to:

- a. Preplanned preventive maintenance or testing.
- b. An inoperable support system with no potential common mode failure for the remaining diesel generators, or
- c. An independently testable component with no potential common mode failure for the remaining diesel generators.

\* Force paralleling only applies to the Emergency Diesel Generator System with two operable diesel generators.

**Insert 3**

**AC Power Operability During Cold Shutdown or Refueling Modes**

Whenever the reactor is in the cold shutdown or refueling mode, a minimum of one offsite power source and one individual diesel generator, and all its associated emergency equipment, shall be operable whenever any work is being done which has the potential for draining the vessel, secondary containment is required, or a core or containment cooling system is required. When this condition is not met, initiate actions to suspend all work that could cause draining of the vessel, suspend core alterations and handling of irradiated fuel assemblies in the secondary containment, declare required core or containment cooling systems inoperable and immediately initiate actions to restore required AC power sources.

**MARKUP OF TECHNICAL SPECIFICATION PAGES**

**INSERTS  
(Pg. 2 of 2)**

**Insert 4**

If one of the individual diesel generators in an Emergency Diesel Generator System is not operable, the plant shall be permitted to operate at power for 14 days provided both sources of reserve power are operable. If one of the Emergency Diesel Generator Systems is not operable the plant shall be permitted to operate for 7 days provided both sources of reserve power are operable. This is based on the following:

1. If one of the individual diesel generators in an Emergency Diesel Generator System is not operable, the three remaining diesel generators are capable of carrying sufficient engineered safeguards and emergency core cooling system loads (two core spray systems and at least one RHR pump) to mitigate all loss-of-coolant accidents.
2. If one Emergency Diesel Generator System is not operable, the remaining Emergency Diesel Generator System is capable of carrying sufficient engineered safeguards and emergency core cooling system loads (at least one core spray system and one RHR pump) to mitigate all loss-of-coolant accidents.
3. The reserve (offsite) power is highly reliable.

**Insert 5**

**AC Power Operability During Cold Shutdown or Refueling Modes**

One offsite power source and one diesel generator ensure the availability of the required power to recover from postulated events when in the cold shutdown or refueling modes and when handling irradiated fuel.