May 9, 1991

Docket No. 50-247

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Mr. Stephen B. Bram
Vice President, Nuclear Power
Consolidated Edison Company
of New York, Inc.
Broadway and Bleakley Avenue
Buchanan, New York 10511

Dear Mr. Bram:

SUBJECT: ISSUANCE OF AMENDMENT FOR INDIAN POINT NUCLEAR GENERATING UNIT NO. 2 (TAC NO. 76009)

The Commission has issued the enclosed Amendment No. 153 to Facility Operating License No. DPR-26 for the Indian Point Nuclear Generating Unit No. 2. The amendment consists of changes to the Technical Specifications in response to your application transmitted by letter dated September 26, 1990.

The amendment revises Technical Specification Section 3.3 to reflect changes made to the power feeds to the Component Cooling Water Pumps and revises Sections 3.7 and 4.6 to show the increased Emergency Diesel Generator (EDG) short-term rating, the resultant increase in required EDG fuel oil storage requirement, and the update of the designation of power feeds at the Buchanan Substation.

A copy of the related Safety Evaluation is enclosed. A Notice of Issuance will be included in the Commission's next regular biweekly Federal Register notice.

Sincerely,

Original signed by:

Francis J. Williams, Jr., Project Manager
Project Directorate I-1
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Enclosures:
1. Amendment No. 153 to DPR-26
2. Safety Evaluation

cc w/enclosures:
See next page

*See previous concurrence

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

May 9, 1991

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See next page

cc:

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Buchanan, New York 10511

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

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.

DOCKET NO. 50-247

INDIAN POINT NUCLEAR GENERATING UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 153
License No. DPR-26

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Consolidated Edison Company of of New York, Inc. (the licensee) dated September 26, 1990, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. DPR-26 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 153, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is to be effective and implemented prior to plant startup from the current refueling outage conditioned upon completion of the modifications which provide independent power feeds for the component cooling water pumps.

FOR THE NUCLEAR REGULATORY COMMISSION

Robert A. Capra

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

Attachment:
Changes to the Technical
Specifications

Date of Issuance: May 9, 1991

ATTACHMENT TO LICENSE AMENDMENT NO. 153

FACILITY OPERATING LICENSE NO. DPR-26

DOCKET NO. 50-247

Revise Appendix A as follows:

Remove Pages	Insert Pages
3.3-7	3.3-7
3.3-8	3.3-8
3.3-16	3.3-16
3.3-17	3.3-17
3.3-18	3.3-18
3.7-1	3.7-1
3.7-2	3.7-2
3.7-3	3.7-3
3.7-4	3.7-4
3.7-5	3.7-5
3.7-6	3.7-6
3.7-7	3.7-7
3.7-8	3.7-8
4.6-1	4.6-1
4.6-2	4.6-2
4.6-3	4.6-3
4.6-4	4.6-4

c. In either case, if the WC & PP System is not restored to an operable status 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.

E. COMPONENT COOLING SYSTEM

1. The reactor shall not be made critical unless the following conditions are met:

a. Three component cooling pumps together with their associated piping and valves are operable.

b. Two auxiliary component cooling pumps together with their associated piping and valves are operable.

c. Two component cooling heat exchangers together with their associated piping and valves are operable.

2. During power operation, the requirements of 3.3.E.1 may be modified to allow one of the following components to be inoperable at any one time. If the system is not restored to meet the conditions of 3.3.E.1 within the time period specified, the reactor shall be placed in the hot shutdown condition utilizing normal operating procedures. If the requirements of 3.3.E.1 are not satisfied within an additional 48 hours, the reactor shall be placed in the cold shutdown condition utilizing normal operating procedures.

a. One of the three operable component cooling pumps may be out of service provided the pump is restored to operable status within 14 days.

b. An additional component cooling pump may be out of service provided a second pump is restored to operable status within 24 hours.

c. One auxiliary component cooling pump may be out of service provided the pump is restored to operable status within 24 hours and the other pump is demonstrated to be operable.

d. One component cooling heat exchanger or other passive component may be out of service for a period not to exceed 48 hours provided the system may still operate at design accident capability.

F. SERVICE WATER SYSTEM

1. DESIGNATED ESSENTIAL HEADER

a. The reactor shall not be above 350°F unless three service water pumps with their associated piping and valves are operable on the designated essential header.

b. When the reactor is above 350°F and one of the three service water pumps or any of its associated piping or valves is found inoperable, and an essential service water header that meets the requirements of 3.3.F.1.a. cannot be restored within 12 hours, the reactor shall be placed in the hot shutdown condition within the next 6 hours and subsequently cooled below 350°F using normal operating procedures.

2. DESIGNATED NON-ESSENTIAL HEADER

a. The reactor shall not be above 350°F unless two service water pumps with their associated piping and valves are operable on the designated non-essential header.

b. When the reactor is above 350°F and one of the two service water pumps or any of its associated piping or valves is found inoperable, and a non-essential service water header that meets the requirements of 3.3.F.2.a cannot be restored within 24 hours, the reactor shall be placed in the hot shutdown condition within the next 6 hours and subsequently cooled below 350°F using normal operating procedures.

If offsite power is available or all diesel generators are operating to provide emergency power, the remaining installed iodine removal equipment (two charcoal filters and their associated fans, and one containment spray pump and sodium hydroxide addition) can be operated to provide iodine removal in excess of the minimum requirements. Adequate power for operation of the redundant containment heat removal systems (i.e., five fan-cooler units or two containment spray pumps) is assured by the availability of offsite power or operation of all emergency diesel generators.

One of the five fan cooler units is permitted to be inoperable during power operation. This is an abnormal operating situation, in that the normal plant operating procedures require that an inoperable fan-cooler be repaired as soon as practical.

However, because of the difficulty of gaining access to make repairs, it is important on occasion to be able to operate temporarily without at least one fan-cooler. Compensation for this mode of operation is provided by the high degree of redundancy of containment cooling systems during a Design Basis Accident.

The Component Cooling System is different from the system discussed above in that the pumps are so located in the Auxiliary Building as to be accessible for repair after a loss-of-coolant accident[6]. During the recirculation phase following a loss-of-coolant accident, only one of the three component cooling pumps is required for minimum safeguards[7]. With two operable component cooling pumps, 100% redundancy will be provided. A total of three operable component cooling pumps will provide 200% redundancy. The 14 day out of service period for the third component cooling pump is allowed since this is the 200% redundant pump.

A total of six service water pumps are installed. Only two of the set of three service water pumps on the header designated the essential header are required immediately following a postulated loss-of-coolant accident[8]. The limit on the service water maximum inlet temperature assures that the service water and component cooling water systems will be able to dissipate the heat loads generated in the limiting design basis accident.[12]

During the second phase of the accident, one additional service water pump on the non-essential header will be manually started to supply the minimum cooling water requirements for the component cooling loop.

The limits for the accumulators and their pressure and volume assure the required amount of water injection following a loss-of-coolant accident, and are based on the values used for the accident analysis[9].

Two independent diverse systems are provided for removal of combustible hydrogen from the containment building atmosphere: (1) the hydrogen recombiners, and (2) the post-accident containment venting system. Either of the two (2) hydrogen recombiners or the post-accident containment venting system are capable of wholly providing this function in the event of a design basis accident.

Two full-rated hydrogen recombination systems are provided in order to control the hydrogen evolved in the containment following a loss-of-coolant accident. Either system is capable of preventing the hydrogen concentration from exceeding 2% by volume within the containment. Each system is separate from the other and is provided with redundant features. Power supplies for the blowers and ignitors are separate, so that loss of one power supply will not affect the remaining system. Hydrogen gas is used as the externally supplied fuel. Oxygen gas is added to the containment atmosphere through a separate containment feed to prevent depletion of oxygen in the air below the concentration required for stable operation of the combustor (12%). The containment atmosphere sampling system consists of a sample line which originates in each of the containment fan cooler units. The fan and sampling pump head together are sufficient to pump containment air in a loop from the fan cooler through a containment penetration to a sample vessel outside the containment, and then through a second penetration to the sample termination inside the containment. The design hydrogen concentration for operating the recombiner is established at 2% by volume. Conservative calculations indicate that the hydrogen content within the containment will not reach 2% by volume until 13 days after a loss-of-coolant accident. There is therefore no need for immediate operation of the recombiner following an accident, and the quantity of hydrogen fuel stored at the site will be only for periodic testing of the recombiners.

The Post-Accident Containment Venting System consists of a common penetration line which acts as a supply line through which hydrogen-free air can be admitted to the containment, and an exhaust line, with parallel valving and piping, through which hydrogen-bearing gases from containment may be vented through a filtration system.

The supply flow path makes use of instrument air to feed containment. The nominal flow rate from either of the two instrument air compressors is 200 scfm. If the instrument air system is not available, the station air system is available as a backup.

The exhaust line penetrates the containment and then is divided into two parallel lines. Each parallel line contains a pressure sensor and all the valves necessary for controlling the venting operation. The two lines then rejoin and the exhaust passes through a flow sensor and a temperature sensor before passing through roughing, HEPA and charcoal filters. The exhaust is then directed to the plant vent.

The post-accident containment venting system is a passive system in the sense that a differential pressure between the containment and the outside atmosphere provides the driving force for the venting process to take place. The system is designed such that a minimum internal containment pressure of 2.14 psig is required for the system to operate properly.

The flow rate and the duration of venting required to maintain the hydrogen concentration at or below 3 percent of the containment volume are determined from the containment hydrogen concentration measurements and the hydrogen generation rate. The containment pressure necessary to obtain the required vent flow is then determined. Using one of the air compressors, hydrogen-free air is pumped into the containment until the required containment pressure is reached. The air supply is then stopped and the supply/exhaust line is isolated by valves outside the containment. The addition of air to pressurize the containment dilutes the hydrogen; therefore, the containment will remain isolated until analysis of samples indicates that the concentration is again approaching 3 percent by volume. Venting will then be started. This process of containment pressurization followed by venting is repeated as may be necessary to maintain the hydrogen concentration at or below 3 volume percent.

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.

Specifications

A. The reactor shall not be made critical without:

1. two 138 kV lines to Buchanan fully operational,

2. the 6.9 kV buses 5 and 6 energized from the 138 kV source,

3. one 13.8 kV source fully operational and the 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 open,

5. three diesel generators operable with onsite supply of 19,000 gallons of fuel available in the individual storage tanks and 29,000 gallons of fuel available at the Buchanan Substation, or onsite other than the normal supply tanks, and

6. station batteries Nos. 21, 22, 23, & 24 and their associated battery chargers and dc distribution systems operable.

B. During power operation, the following components may be inoperable:

1. Power operation may continue for seven days if one diesel is inoperable 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. Power operation may continue for 24 hours, if the 138 kV or the 13.8 kV source of power is lost, provided the three diesel generators are operable. This operation may be extended beyond 24 hours provided the failure is reported to the NRC within the subsequent 24-hour period with an outline of the plans for restoration of offsite power.

3. If the 138 kV power source is lost, in addition to satisfying the requirements of Specification 3.7.B.2 above, the 6.9 kV bus tie breaker control switches 1-5, 2-5, 3-6, and 4-6 in the CCR shall be placed in the "pull-out" position and tagged to prevent an automatic transfer of the 6.9 kV buses 1, 2, 3 and 4.

4. One battery may be inoperable for 24 hours provided the other batteries and four battery chargers remain operable with one battery charger carrying the dc load of the failed battery's supply system.

5. One battery charger may be inoperable for 24 hours provided the following conditions are satisfied:

   a. The other three battery chargers and their associated batteries are operable; and

   b. The affected battery shall have the Specification 4.6.C.1 surveillance initiated within one hour of the time the battery charger is determined to be inoperable and the surveillance shall be repeated every eight hours thereafter to determine battery

operability. This surveillance frequency shall be maintained until the battery is declared inoperable or until the battery charger is declared operable.

C. Gas Turbine Generators:

1. At least one gas turbine generator (GT-1, GT-2 or GT-3) and associated switchgear and breakers shall be operable at all times.

2. A minimum of 54,200 gallons of fuel for the operable gas turbine generator shall be available at all times.

3. If the requirements of 3.7.C.1 or 3.7.C.2 cannot be met, then, within the next seven (7) days, either the inoperable condition shall be corrected or an alternate independent power system shall be established.

4. If the requirements of 3.7.C.3 cannot be satisfied, the reactor shall be placed in the hot shutdown condition utilizing normal operating procedures. If the requirements of 3.7.C.3 cannot be met within an additional 48 hours, the reactor shall be placed in the cold shutdown condition utilizing normal operating procedures.

The requirements of Specification 3.7.A may be modified for an emergency "Black Start" of the unit by using the requirements of either Specification 3.7.D.1 or 3.7.D.2 below:

D.1. a. all 138 kV lines to Buchanan de-energized,

b. the 13.8 kV line de-energized,

c. the 6.9 kV buses 5 and 6 energized from the onsite gas turbine through the 13.8/6.9 kV transformer,

d. the four 480-volt buses 2A, 3A, 5A and 6A energized from the diesels and the tie breakers between buses 5A and 2A and between buses 3A and 6A open,

e. three diesel generators operable with onsite supply of 19,000 gallons of fuel available in the individual storage tanks and 29,000 gallons of fuel available at the Buchanan Substation, or on-site other than the normal supply tanks,

f. station batteries Nos. 21, 22, 23 & 24 and their associated battery chargers and dc distribution systems operable, and

g. the 480-volt tie breakers 52/2A, 52/3A, 52/5A and 52/6A open.

D.2. a. establish 138 kV bus sections at Buchanan with at least 37 MW power (nameplate rating) from any combination of gas turbines at Buchanan and onsite,

b. two 138 kV lines to Buchanan energized from the gas turbines with breakers to Millwood, the 138/345 kV tie to Buchanan and to the Peekskill Refuse Plant open,

c. the 13.8 kV line to Buchanan operable and the 13.8/6.9 kV transformer available to supply 6.9 kV power,

d. the 6.9 kV buses energized from the 138 kV source,

e. 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 open,

f. three diesel generators operable with onsite supply of 19,000 gallons of fuel available in the individual storage tanks and 29,000 gallons of fuel available at the Buchanan Substation, or on-site other than the normal supply tanks, and

g. station batteries Nos. 21, 22, 23 & 24 and their associated battery chargers and dc distribution systems operable.

E. Whenever the reactor is critical, the circuit breaker on the electrical feeder to emergency lighting panel 218 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 plant safety. The 480-volt equipment is arranged in four buses. The 6.9 kv equipment is supplied from six buses.

In addition to the unit transformer, three 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 sources. The charging pumps are supplied from the 480-volt buses Nos. 3A, 5A, and 6A. The five containment fans are divided among the 480-volt buses. The two residual heat pumps are on separate 480-volt buses. Valves are supplied from separate motor control centers.

The station auxiliary transformer or a gas turbine is capable of providing sufficient power for plant startup. The station auxiliary transformer can supply the required plant auxiliary power during normal operation.

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, at design load, the minimum required engineered safeguards equipment(1). The minimum diesel fuel oil inventory in the storage tanks is maintained at all times to assure the operation of two diesels carrying their associated engineered safeguards equipment for at least seventy three hours(2). Additional fuel oil suitable for use in the diesel generators will be stored either onsite or at the Buchanan Substation. The minimum storage of 29,000 gallons of additional fuel oil will assure continuous

operation of two diesels for at least one hundred and twelve hours at the minimum load for engineered safeguards. Commercial oil supplies and trucking facilities exist to assure deliveries within one day's notice.

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 ensures that adequate dc power will be available for starting the emergency diesel generators and other emergency uses.

The plant can be safely shut down 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 the safety systems.

Three (3) gas turbine generators are directly available to the Indian Point site. One is located onsite (GT-1) and two additional units are located at the adjacent Buchanan Substation (GT-2 and GT-3). One gas turbine generator is more than adequate to provide an additional contingency of backup electrical power for maintaining the plant in a safe shutdown condition. The specified gas turbine generator minimum fuel inventory of 54,200 gallons assures that one gas turbine generator will be capable of supplying more than the maximum electrical load for the Indian Point Unit No. 2 alternate safe shutdown power supply system (i.e., 750 kW) for at least three (3) days. Commercial oil supplies and trucking facilities exist to assure deliveries of additional fuel oil within one day's notice.

Conditions of a system-wide blackout could result in a unit trip. Since normal offsite power supplies as required in Specification 3.7.A are not available for startup, it is desirable to be able to blackstart this unit with onsite power supplies as a first step in restoring the system to an operable status and restoring power to customers for essential service. Specification 3.7.D.1 provides for startup using the onsite gas turbine to supply the 6.9 kV loads and the diesels

to supply the 480-volt loads. Tie breakers between the 6.9 kV and 480-volt systems are open so that the diesels would not be jeopardized in the event of any incident and would be able to continue to supply 480-volt safeguards power. The scheme consists of starting two reactor coolant pumps, one condensate pump, 2 circulating water pumps and necessary auxiliaries to bring the unit up to approximately 10% power. At this point, loads can be assumed by the main generator and power supplied to the system in an orderly and routine manner.

Specification 3.7.D.2 is identical with normal start-up requirements as in Specification 3.7.A except that offsite power is supplied exclusively from gas turbines with a minimum total power of 37 MW (nameplate rating), which is sufficient to carry out normal plant startup.

As a result of an investigation of the effect components, that might become submerged following a LOCA, may have on 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 218 inside containment. With the circuit breaker in the open position, containment electrical penetration H-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.

When the 138 kV source of offsite power is out of service, the automatic transfer of 6.9 kV Buses 1, 2, 3 and 4 to offsite power after a unit trip could result in overloading of the 20 MVA 13.8 kV/6.9 kV auto-transformer. Accordingly, the intent of Specification 3.7.B.3 is to prevent the automatic transfer when only the 13.8 kV source of offsite power is available. However, this specification is not intended to preclude subsequent manual operations or bus transfers once sufficient loads have been stripped to assure that the 20 MVA auto-transformer will not be overloaded by these manual actions.

References

(1) UFSAR Section 8.2.1

(2) UFSAR Section 8.2.3

4.6 EMERGENCY POWER SYSTEM PERIODIC TESTS

Applicability

Applies to periodic testing and surveillance requirements of the emergency power systems.

Objective

To verify that emergency power systems will respond promptly and properly when required.

Specifications

The following tests and surveillances shall be performed as stated:

A. DIESEL GENERATORS

1. Each month, each diesel generator shall be manually started and synchronized to its bus or buses and shall be allowed to assume the normal bus load.

2. At each refueling outage, each diesel generator shall be manually started, synchronized and loaded up to its continuous (nameplate) and short term ratings.

3. At each refueling outage, to assure that each diesel generator will automatically start and assume the required load within 60 seconds after the initial start signal, the following shall be accomplished: by simulating a loss of all normal AC station service power supplies and simultaneously simulating a Safety Injection signal, observations shall verify automatic start of each diesel generator, required bus load shedding and restoration to operation of particular vital equipment. To prevent Safety Injection flow to the core, certain safeguards valves will be closed and made inoperable.

4. Each diesel generator shall be given a thorough inspection at least annually following the manufacturer's recommendations for this class of stand-by service.

The above tests will be considered satisfactory if the required minimum safeguards equipment operated as designed.

B. DIESEL FUEL TANKS

A minimum oil storage of 48,000 gallons will be maintained for the station at all times.

C. STATION BATTERIES (NOS. 21, 22, 23 & 24)

1. Every month, the voltage of each cell, the specific gravity and temperature of a pilot cell in each battery and each battery voltage shall be measured and recorded.

2. Every 3 months, each battery shall be subjected to a 24-hour equalizing charge, and the specific gravity of each cell, the temperature reading of every fifth cell, the height of electrolyte, and the amount of water added shall be measured and recorded.

3. Each time data is recorded, new data shall be compared with old to detect signs of abuse or deterioration.

4. At each refueling interval, each battery shall be subjected to a load test and a visual inspection of the plates.

D. GAS TURBINE GENERATORS

1. At monthly intervals, at least one gas turbine generator shall be started and synchronized to the power distribution system for a minimum of thirty (30) minutes with a minimum electrical output of 750 kW.

E. GAS TURBINE FUEL SUPPLY

1. At weekly intervals, the minimum gas turbine fuel volume shall be verified to be available and shall be documented in the plant log.

Basis

The tests specified in Specifications 4.6.A, 4.6.B and 4.6.C are designed to demonstrate that the diesel generators will provide power for operation of equipment. They also assure that the emergency diesel generator system controls and the control systems for the safeguards equipment will function automatically in the event of a loss of all normal 480v ac station service power.

The testing frequency specified will be often enough to identify and correct any mechanical or electrical deficiency before it can result in a system failure. The fuel supply is continuously monitored. An abnormal condition in these systems would be signaled without having to place the diesel generators themselves on test.

Each diesel generator has a continuous rating of 1750 kW with a 2 hours within an 24 hour period rating of 2100 kW and a 1/2 hour within any 24 hour period rating of 2300 kW. Two diesels operating within these ratings can power the minimum safeguards loads. A minimum oil storage of 48,000 gallons will provide for operation of the minimum required engineered safeguards on emergency diesel power for a period of 168 hours.

Station batteries will deteriorate with time, but precipitous failure is extremely unlikely. The surveillance specified is that which has been demonstrated over the years to provide an indication of a cell becoming unserviceable long before it fails. The periodic equalizing charge will ensure that the ampere-hour capability of the batteries is maintained.

The refueling interval load test for each battery, together with the visual inspection of the plates, will assure the continued integrity of the batteries.

The batteries are of the type that can be visually inspected, and this method of assuring the continued integrity of the battery is proven standard power plant practice.

The tests specified in Specifications 4.6.D and 4.6.E are designed to assure that at least one gas turbine generator will be available to provide power for operation of equipment if required. Since the Indian Point Unit No. 2 alternate safe shutdown power supply system demands a maximum electrical load of approximately 750 kW, the required minimum test load will demonstrate adequate capability. In addition, the minimum gas turbine fuel oil storage volume of 54,200 gallons will conservatively assure at least three (3) days of operation of a gas turbine generator.

The specified test frequencies for the gas turbine generator(s) and associated fuel supply will be adequate to identify and correct any mechanical or electrical deficiency before it can result in a component malfunction or failure.

Reference

UFSAR Section 8.2

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 153 TO FACILITY OPERATING LICENSE NO. DPR-26

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC

INDIAN POINT NUCLEAR GENERATING UNIT NO. 2

DOCKET NO. 50-247

1.0 INTRODUCTION

On April 24, 1989, while in a refueling outage, the Indian Point Unit No. 2 licensee (Consolidated Edison Company of New York) issued Licensee Event Report (LER) Number 89-06, "Emergency Diesel Generator Loading Analysis." This LER contained information which indicated that for certain assumed conditions, the Emergency Diesel Generators (EDGs) could become overloaded. The technical basis for this LER came from a preliminary analysis. This preliminary analysis was followed by additional more extensive analyses which included a review of the Technical Specifications (TS) to determine if any changes were needed. As a result of these analyses and the commitment by the licensee to enhance the availability of the component cooling water system and other systems, Consolidated Edison proposed design modifications to the Unit 2 EDGs. These design modifications are intended to result in an increase in the EDG short-term rating. The existing EDG rating is 1750kW continuous and 1950kW for 2 hours within any 24-hour period. The proposed EDG rating is 1750kW continuous, 2100kW for 2 hours within any 24-hour period, and 2300kW for one-half hour within any 24-hour period. Accordingly, by letter dated September 26, 1990, the licensee submitted a request to propose changes to TS Sections 3.3.E, 3.7.A, 3.7.D, 4.6.A, and 4.6.B, and TS Bases Sections 3.3, 3.7, and 4.6. These proposed changes would reflect changes made to the power feeds for the component cooling water pumps, increase the EDG fuel oil minimum required storage, and clarify the text with respect to increasing the EDG short-term rating, the EDG nameplate rating, the tanks designated to store the minimum EDG fuel oil inventory, and the 138/345 kv feeds at the Buchanan Substation.

2.0 EVALUATION

2.1 Proposed Emergency Diesel Generator Short Term Kilowatt Output Rating

In order to obtain the proposed EDG short term kilowatt output rating with the current Unit 2 EDGs, the licensee is installing diesel generator upgrade packages. The upgrade package for each of the three EDGs consists of several design modifications. These design modifications are in accordance with recommendations provided by the manufacturer.

To provide assurance that each upgraded EDG unit satisfactorily performs its expected function, the licensee has committed to test each one in accordance

with a modification testing program. This testing program consists of several specific tests. These tests will be performed following completion of the initial adjustments and normal wear-in tests required by Consolidated Edison for acceptance of the upgrade modifications. Each test along with information relating to the test objective is provided below.

1. Start and Load Run Test

   This test is to demonstrate proper startup from standby conditions and includes verifying that required design voltage and frequency are attained. The test should also demonstrate a load carrying capability of 1750kW for a time period of not less than 1 hour.

2. Fast-Start Test

   The fast-start test is to demonstrate that each modified EDG unit starts from standby conditions and reaches rated voltage and frequency within required time limits.

3. Combined Safety Injection Actuation Signal and Loss of Offsite Power Test

   This test is to demonstrate upon loss of emergency bus voltage that (1) non-essential electrical loads are shed from the bus and (2) the attendant modified EDG unit starts on an auto-start signal from standby conditions, sequentially energizes emergency loads, and maintains required voltage and frequency during the transients.

4. Single Load Rejection Test

   For this test, each modified EDG unit should demonstrate the capability to reject a load equal to the largest single load (375kW) while maintaining generator output voltage and frequency within established limits.

5. Full Load Rejection Test

   The objective of this test is to demonstrate the capability of each modified EDG unit to reject a load equal to its maximum design load and maintain voltage requirements as well as not trip on engine overspeed.

6. Endurance and Margin Test

   This test is to demonstrate the full load carrying capability of each modified EDG unit for a time period of not less than 24 hours, of which 2 hours will be at a load of 2100kW, 1/2 hour at a load of 2300kW, and the remaining 21 1/2 hours at a load of 1750kW.

7. Hot Restart Test

   The hot restart test is to demonstrate the ability of each modified EDG unit to immediately restart following shutdown from full load (1750kW) thermal equilibrium operation.

8. Reliability Test

This test is to demonstrate that the modifications to each EDG unit have not affected its reliability. To achieve this, 30 valid start and load tests per item 1 above are to be performed on each EDG unit without failure. The first modified unit to successfully complete this testing will be considered operable for technical specification compliance. The other two modified units will be considered operable upon successful completion of 10 valid start and load tests with the remaining 20 being completed by conducting a minimum of 2 tests per week.

On the bases of conformance of the modification testing program to the appropriate guidance provided in Regulatory Guide 1.9 (Selection of Diesel Generator Set Capacity for Standby Power Supplies) and Regulatory Guide 1.108 (Periodic Testing of Diesel Generator Units Used as Onsite Electric Power Systems at Nuclear Power Plants), there is reasonable assurance that the modified EDGs will have adequate capacity, capability, and reliability. Therefore, the proposed revised technical specifications which reflect the proposed EDG ratings are acceptable pending satisfactory results from the EDG modification testing program.

2.2 Electrical Power Sources and Attendant Cables For the Component Cooling Water System Pump Motors

The current electrical power feed configuration for Component Cooling Water Pump (CCWP) motors designated as numbers 21, 22, and 23 is such that EDG number 21 feeds CCWP motor 21 and EDG number 22 feeds both CCWP motors 22 and 23. The current technical specifications address the availability of CCWPs by their EDG supply bus. Since both CCWP motors 22 and 23 are powered from the same EDG bus, their operability status if CCWP 21 is out of service does not satisfy the current applicable technical specification requirements. In addition, electrical power cables for CCWP motors 21 and 22 are routed in the same cable tray. Two changes in the electrical design arrangement are being made and related revised technical specification sections are being proposed. One of these changes involves re-routing the power feeder for CCWP motor 23 such that EDG number 23 feeds this motor rather than EDG number 22. The other change involves providing separation between power feeder cables for CCWP motors 21 and 22. These changes enhance the existing component cooling water system since they increase the level of independence and redundancy of the power sources for the CCWP motors and are therefore acceptable.

2.3 Proposed TS Changes Related to Component Cooling Water System (CCWS)

As discussed in Section 2.2 above, the power sources and attendant cables for the CCWP motors are being modified, resulting in all three pumps being powered

from separate diesels. Consequently, with two operable CCPs 100% redundancy will be provided. A total of three operable CCPs will provide 200% redundancy.

a. Existing TS Section 3.3.E.1.a states: "Two component cooling pumps on busses supplied by different diesels together with their associated piping and valves are operable."

The proposed TS changes will revise Section 3.3.E.1.a to state: "Three component cooling pumps together with their associated piping and valves are operable."

This proposed TS change will reflect the modifications made to the power feeds for the component cooling pumps (resulting in all three pumps being powered from separate diesel generators and 200% redundancy). Therefore, we find it acceptable.

b. Existing TS Section 3.3.E.2, in part states: "One of the two operable component cooling pumps may be out of service provided the pump is restored to operable status within 24 hours."

The proposed TS change will revise the above statement to state that (1) one of the three operable component cooling pumps may be out of service provided the pump is restored to operable status within 14 days and (2) an additional component cooling pumps may be out of service provided a second pump is restored to operable status within 24 hours.

The licensee's rationale for the above proposed TS change is that with two operable component cooling pumps, 100% redundancy will be provided. A total of three operable component cooling pumps will provide 200% redundancy. The 14 days out of service period for the third component cooling pump is allowed since this is the 200% redundant pump. We concur with licensee's rationale and find the proposed TS change acceptable.

2.4 TS Changes Related to Minimum Required Fuel Oil Inventory And Locations

The existing EDG rating is 1750kW continuous and 1950kW for 2 hours within any 24 hour period. The new rating is 1750kW continuous, 2100kW for 2 hours within any 24 hour period, and 2300kW for ½ hour within any 24 hour period. Accordingly, the licensee determined that the existing EDG fuel oil inventory should be enhanced. A new diesel fuel oil calculation was performed based upon the guidance provided in ANSI N195-1976, and the assumption that the two EDGs ran continuously for 7 days and that the first 2 hours of every 24 hours was at 2100kW. The results of the calculation showed a fuel oil inventory requirement of 44,143 gallons. Therefore, the licensee proposed a minimum requirement of 48,000 gallons which includes a 9 percent margin to be maintained at the station for all times.

Subsequently, the licensee proposed changes to the TS to reflect this new minimum requirement of fuel oil inventory.

The existing TS requires a minimum oil storage of 41,000 gallons to be maintained for the station at all times (19,000 gallons of fuel available in the on-site storage tanks and 22,000 gallons of fuel available at the Buchanan Substation, or on-site other than the normal supply tanks). Under the proposed TS amendment, the above requirement for minimum oil storage will be increased from 41,000 gallons to 48,000 gallons (19,000 gallons of fuel available in the on-site storage tanks, 29,000 gallons of fuel available at the Buchanan Substation, or on-site other than the normal supply tanks). Based on our review of the rationale submitted by the licensee, we find the licensee's proposed change to the TS with respect to minimum fuel oil inventory acceptable.

These changes are reflected in TS 3.7.A.5, 3.7.D.1.e, 3.7.D.2.f, 4.6.B, and TS Bases 3.7 and 4.6.

2.5 Proposed TS Changes Related to Increased EDG Short Term Rating

The increased short term EDG rating is reflected in the TS Bases 4.6. In TS 4.6.A.2, the licensee has added the requirement to load each EDG to its short term rating at each refueling outage.

Section 2.1 above provides the staff evaluation finding the increased EDG short term rating acceptable. The load test at each refueling outage is an enhancement to the periodic testing of the EDGs. We, therefore, find these TS changes acceptable.

2.6 Proposal TS Changes Related to "Black Start"

TS 3.7.D.2.b is changed to show different breakers designated as open during the "Black Start" which uses gas turbines including those at the Buchanan Substation. This change is not related to the increased EDG rating or change in power source to the CCWP's. It reflects a change in the offsite grid connections to the Buchanan Substation. It does not change the required offiste power capabilities and we find the change acceptable.

3.0 STATE CONSULTATION

In accordance with the Commission's regulations, the New York State official was notified of the proposed issuance of the amendment. The State official had no comments.

4.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the

amendment involves no significant hazards consideration, and there has been no public comment on such finding (55 FR 45878). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

5.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

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