ATTACHMENT A

APPLICATION FOR AMENDMENT TO
OPERATING LICENSE

Technical Specification
Page Revisions

Consolidated Edison Company of New York, Inc.

Indian Point Unit No. 2
Docket No. 50-247
Facility Operating License No. DPR-26

March, 1977

3.3 ENGINEERED SAFETY FEATURES

Applicability

Applies to the operating status of the Engineered Safety Features.

Objective

To define those limiting conditions for operation that are necessary: (1) to remove decay heat from the core in emergency or normal shutdown situations, (2) to remove heat from containment in normal operating and emergency situations, (3) to remove airborne iodine from the containment atmosphere following a Design Basis Accident, (4) to minimize containment leakage to the environment subsequent to a Design Basis Accident.

Specification

The following specifications apply except during low temperature physics tests.

A. Safety Injection and Residual Heat Removal Systems

1. The reactor shall not be made critical, except for low temperature physics tests, unless the following conditions are met:

   a. The refueling water storage tank contains not less than 345,000 gallons of water with a boron concentration of at least 2000 ppm.

   b. The boron injection tank contains not less than 1000 gallons of a 11 1/2% to 13% by weight (20,000 ppm to 22,500 ppm of boron) boric acid solution at a temperature of at least 145°F. Two channels of heat tracing shall be available for the flow path. Valves 1821 and 1831 shall be open and valves 1822A and 1822B shall be closed, except during short periods of time when they can be cycled to demonstrate their operability.

   c. The four accumulators are pressurized to at least 600 psig and each contains a minimum of 734 ft^3 and a maximum of 749 ft^3 of water with a boron concentration of at least 2000 ppm. None of these four accumulators may be isolated.

   d. Three safety injection pumps together with their associated piping and valves are operable.

e. Two residual heat removal pumps and heat exchangers together with their associated piping and valves are operable.

f. Two recirculation pumps together with the associated piping and valves are operable.

g. Valves 842 and 843 in the mini-flow return line from the discharge of the safety injection pumps to the RWST are de-energized in the open position.

h. Valves 856A, C, D and E, in the discharge header of the safety injection header are in the open position. Valves 856B and F, in the discharge header of the safety injection header are in the closed position. The hot leg valves (856B and F) shall be closed with their motor operators de-energized by locking out the circuit breakers at the Motor Control Centers.

i. The four accumulator isolation valves shall be open with their motor operators de-energized by locking out the circuit breakers at the Motor Control Centers.

j. Valve 1810 on the suction line of the high-head SI pumps and valves 882 and 744, respectively on the suction and discharge line of the residual heat removal pumps, shall be blocked open by de-energizing the valve-motor operators.

k. The refueling water storage tank low level alarms are operable and set to alarm between 92,800 gallons and 99,000 gallons of water in the tank.

2. During power operation, the requirements of 3.3.A-1 may be modified to allow any one of the following components to be inoperable at any one time. If the system is not restored to meet the requirements of 3.3.A-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.A-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 safety injection pump may be out of service, provided the pump is restored to operable status within 24 hours and the remaining two pumps are demonstrated to be operable.

b. One residual heat removal pump may be out of service, provided the pump is restored to operable status within 24 hours and the other residual heat removal pump is demonstrated to be operable.

c. One residual heat removal exchanger may be out of service provided that it is restored to operable status within 48 hours.

d. Any valve required for the functioning of the system during and following accident conditions may be inoperable provided that it is restored to operable status within 24 hours and all valves in the system that provide the duplicate function are demonstrated to be operable.

e. One channel of heat tracing may be out of service for 48 hours.

f. One refueling water storage tank low level alarm may be inoperable for up to 7 days provided the other low level alarm is operable.

B. Containment Cooling and Iodine Removal Systems

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

a. The spray additive tank contains not less than 4000 gallons of solution with a sodium hydroxide concentration or not less than 30% by weight.

b. The five fan cooler-charcoal filter units and the two spray pumps, with their associated valves and piping, are operable.

2. During power operation, the requirements of 3.3.B-1 may be modified to allow any one of the following components to be inoperable. If the system is not restored to meet the

is capable of maintaining the tunnel temperature below 104°F. Under the same worst conditions, if no ventilation fans were operating, the natural air circulation through the tunnel would be sufficient to limit the gross tunnel temperature below a tolerable value of 140°F. However, in order to provide for ample tunnel ventilation capacity, the two ventilation fans are required to be operable when the reactor is made critical. If one ventilation fan is found inoperable, the daily testing of the other fan will ensure that cable tunnel ventilation is available.

Valves 856A, C, D and E are maintained in the open position during plant operation to assure a flow path for high-head safety injection during the injection phase of a loss-of-coolant accident. Valves 856B and F are maintained in the closed position during plant operation to prevent hot leg injection during the injection phase of a loss-of-coolant accident. As an additional assurance of preventing hot leg injection, the valve motor operators are de-energized to prevent spurious opening of these valves. Power will be restored to these valves at an appropriate time in accordance with plant operating procedures after a loss-of-coolant accident in order to establish hot leg recirculation.

Valves 842 and 843 in the mini-flow return line from the discharge of the safety injection pumps to the refueling water storage tank are de-energized in the open position to prevent an extremely unlikely spurious closure which would cause the safety injection pumps to overheat if the reactor coolant system pressure is above the shutoff head of the pumps.

The specified quantities of water for the RWST include unavailable water (4687 gals) in the tank bottom, inaccuracies (6200 gals) in the alarm set-points, and minimum quantities required during injection (246,000 gals)[3] and recirculation phases (80,000 gals).[4] The minimum RWST (i.e., 345,000 gals) provides approximately 8,100 gallons margin.

References

(1) FSAR Section 9
(2) FSAR Section 6.2
(3) FSAR Section 6.2
(4) FSAR Section 6.3
(5) FSAR Section 14.3.5
(6) FSAR Section 1.2
(7) FSAR Section 8.2
(8) FSAR Section 9.6.1
(9) FSAR Section 14.3
(10) WCAP 8399 "ECCS Acceptance Criteria Analysis, Indian Point Nuclear Generation Station Unit No. 2", September 1974, Westinghouse Non-Proprietary Class 3.
(11) Indian Point Unit No. 3 FSAR Sections 6.2 and 6.3 and the Safety Evaluation accompanying "Application for Amendment to Operating License" sworn to by Mr. William J. Cahill, Jr. on March 28, 1977.

B. If any of the specified limiting conditions for refueling is not met, refueling shall cease until the specified limits are met, and no operations which may increase the reactivity of the core shall be made.

Basis

The equipment and general procedures to be utilized during refueling are discussed in the FSAR. Detailed instructions, the above-specified precautions, and the design of the fuel-handling equipment incorporating built-in interlocks and safety features, provide assurance that no incident could occur during the refueling operations that would result in a hazard to public health and safety.(1) Whenever changes are not being made in core geometry, one flux monitor is sufficient. This permits maintenance of the instrumentation. Continuous monitoring of radiation levels (2 above) and neutron flux provides immediate indication of an unsafe condition. The residual heat pump is used to maintain a uniform boron concentration.

The shutdown margin indicated in Part 5 will keep the core subcritical, even if all control rods were withdrawn from the core. During refueling, the reactor refueling cavity is filled with approximately 300,000 gallons of water from the refueling water storage tank with a boron concentration of 2000 ppm. The minimum boron concentration of this water at 1615 ppm boron is sufficient to maintain the reactor subcritical by at least 10% $\Delta k/k$ in the cold shutdown with all rods inserted, and will also maintain the core subcritical even if no control rods were inserted into

Amendment No.

TABLE 4.1-1 (CONTINUED)

	Channel Description	Check	Calibrate	Test	Remarks
10.	Rod Position Bank Counters	S	N.A.	N.A.	With analog rod position
11.	Steam Generator Level	S	R	M	
12.	Charging Flow	N.A.	R	N.A	
13.	Residual Heat Removal Pump Flow	N.A.	R	N.A.	
14.	Boric Acid Tank Level	W	R	N.A.	Bubbler tube rodded during calibration
15.	Refueling Water Storage Tank Level	W	R	N.A.	Low level alarms
16.	Boron Injection Tank Level	W	R	R	
17.	Volume Control Tank Level	N.A.	R	N.A.	
18.	(a) Containment Pressure	D	R	M	Wide range
	(b) Containment Pressure	S	R	M	Narrow range
19.	Process and Area Radiation Monitoring Systems	D	R	M	
20.	Boric Acid Make-up Flow Channel	N.A.	R	N.A.	
21.	Containment and Recirculation Sump Level	N.A.	N.A.	R	
22.	Accumulator Level and Pressure	S	R	N.A.	
23.	Steam Line Pressure	S	R	M	

ATTACHMENT B

APPLICATION FOR AMENDMENT TO
OPERATING LICENSE

Safety Evaluation

Consolidated Edison Company of New York, Inc.

Indian Point Unit No. 2
Docket No. 50-247
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March, 1977

SAFETY EVALUATION

The proposed changes to the Indian Point Unit No. 2 Technical Specifications would allow for a reduction in the required minimum water volume for the Refueling Water Storage Tank (RWST) from the present 350,000 gallons to 345,000 gallons. Since the present required volume of 350,000 gallons is very near the capacity of the tank, lowering the volume to 345,000 gallons would effect more efficient RWST level control. However, such a reduction would maintain a minimum RWST volume that conservatively satisfies requirements for ECCS and for refueling operations.

The capacity of the RWST is presently based on the amount of borated water necessary to fill the refueling canal for refueling operations. A recalculation of the refueling canal volume, however, has established that less than 300,000 gallons of borated water will fill the canal to the minimum required level of 23 feet above the top of the core as specified in sub-paragraph 3.8.A.10 of the Technical Specifications.

Following a postulated loss-of-coolant accident (LOCA), the RWST is required to deliver a minimum of 246,000 gallons during the injection phase of safety injection to conservatively satisfy ECCS requirements. These overlapping requirements are combined in an additive manner for conservatism and are as follows:

Required to refill reactor vessel above nozzles:	21,000 gallons
Required to assure no return to criticality:	50,000 gallons
Volume of water on containment floor required to permit initiation of recirculation:	175,000 gallons
Minimum required for injection phase:	246,000 gallons

The total minimum requirement for the RWST following a postulated LOCA is as follows:

To be delivered during injection phase (see above):	246,000 gallons
To account for instrumentation inaccuracies (i.e ± 3,100 gallons):	6,200 gallons
To be delivered by one containment spray pump after switchover to recirculation phase:	80,000 gallons
To account for unavailable water in RWST bottom:	4,687 gallons
Minimum RWST requirement following a postulated LOCA:	336,887 gallons

The above minimum requirements of 246,000 gallons (injection phase) and 80,000 gallons (recirculation phase) are based on the latest Westinghouse Electric Corporation evaluation as documented in Sections 6.2 and 6.3 of the Indian Point Unit No. 3 Final Facility Description and Safety Analysis Report (FSAR). Any Technical Specification requirement greater than the minimum required 336,887 gallons

provides additional margin above the amount of water necessary to conservatively satisfy requirements following a postulated LOCA. Accordingly, a minimum RWST water volume of 345,000 gallons incorporates an additional margin of 8,113 gallons. Therefore, it is concluded that the proposed lowering of the RWST minimum water volume from 350,000 gallons to 345,000 gallons will have no effect on the safety and accident analyses performed for Indian Point Unit No. 2.

To reflect the reduction in water volume, the present RWST low level and low-low level alarm setpoints must be adjusted. To render the Indian Point Unit No. 2 RWST level sensing and alarm system consistent with the improved Indian Point Unit No. 3 design, both alarms will be adjusted to the same low level. The operator will then be directed to initiate switchover to the recirculation mode upon receiving one of the two RWST low level alarms. The proposed Technical Specification changes would require that these low level alarms be maintained to actuate at water volumes between 92,800 gallons and 99,000 gallons remaining in the RWST. This will assure that the operator receives a proper and timely signal to begin switchover to recirculation.

In addition to the proposed redundant RWST low level alarms, the existing control room RWST level indicator and redundant containment recirculation sump level indicators provide verification that the RWST water has been delivered during the injection phase. This verification prevents premature switchover to recirculation should early spurious actuation of a RWST low level alarm occur.

The PWST level indicator and the sump level indicators also serve to alert the operator to prepare for switchover to recirculation prior to receiving the PWST low level alarms. As previously stated, 175,000 gallons is the minimum water volume on the floor of containment required for initiation of recirculation. Therefore, the minimum volume of 246,000 gallons required to be injected prior to the switchover to recirculation provides a minimum of 71,000 gallons margin.

In summary, the proposed minimum RWST water volume of 345,000 gallons and proposed level instrumentation alarm settings between 92,800 gallons and 99,000 gallons are consistent with required functions. The proposed changes have been reviewed by the Station Nuclear Safety Committee and the Con Edison Nuclear Facilities Safety Committee. Both committees concur that these changes do not represent a significant hazards consideration and will not cause any change in the types or increase in the amounts of effluents or any change in the authorized power level of the facility.