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November 18, 1999

Re: **Indian Point Unit No. 2**  
**Docket No. 50-247**

**Document Control Desk**  
**US Nuclear Regulatory Commission**  
**Mail Station P1-137**  
**Washington, DC 20555-0001**

**Subject: Proposed Amendment Consisting of Changes to Technical Specifications for Containment Air Filtration, Control Room Air Filtration, and Refueling Conditions**

Consolidated Edison Company of New York, Inc. (Con Edison) transmits herewith one (1) signed original and two (2) copies of "Application for Amendment to Operating License" sworn to on November 18, 1999. This Application requests an Amendment to the Technical Specification for Indian Point Unit 2 related to the use of the alternate source term contained in NRC NUREG-1465. This Application replaces in its entirety the similar Application submitted by our letter dated August 30, 1996. Supporting analyses have previously been provided to the NRC by our letter dated October 8, 1999.

Attachment I to the Amendment provides the proposed changed pages, Attachment II provides the proposed changes as markups to the existing Technical Specification pages, and Attachment III provides the Safety Assessment. It has been determined that the changes set forth herein do not represent a significant hazards consideration as defined in 10 CFR50.92(c).

Con Edison requests that appropriate action on this application be completed by February, 2000 in order to complete plans for modifications to be accomplished in the refueling outage scheduled to begin in April, 2000.

Should you or your staff have any questions regarding this submittal, please contact Mr. John McCann, Manager, Nuclear Safety and Licensing.

Attachments

Very truly yours,



ADD1

RD16 ADDGR 05000247

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UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

In the matter of )  
 )  
CONSOLIDATED EDISON COMPANY ) Docket No. 50-247  
OF NEW YORK, INC. )  
(Indian Point Station, Unit No. 2) )

APPLICATION FOR AMENDMENT  
TO OPERATING LICENSE

Pursuant to Section 50.90 of the Regulations of the Nuclear Regulatory Commission (NRC), Consolidated Edison Company of New York, Inc. ("Con Edison"), as holder of Facility Operating License No. DPR-26, hereby applies for amendment of the Technical Specifications contained in Appendix A of the license. Specifically, Consolidated Edison requests that the changes specified in Attachment I be approved. These changes are to the Table of Contents, Section 3.3, Section 3.8, Section 4.5, and Section 5.2 related to implementation of the alternate source term contained in NRC NUREG-1465 at Indian Point Unit 2.

The specific proposed Technical Specification revision is set forth in Attachment I to this application. A mark-up of the existing Technical Specifications is provided in Attachment II. A Safety Assessment of the proposed changes is set forth in Attachment III to this Application. This assessment demonstrates that the proposed changes do not represent a significant hazards consideration as defined in 10 CFR 50.92(c).

As required by 10 CFR 50.91(b)(1), a copy of this application and our analysis concluding that the proposed changes do not constitute a significant hazards consideration have been provided to the appropriate New York State official designated to receive such amendments.

BY:   
James S. Baumstark  
Vice President

Subscribed and sworn to  
before me this 18<sup>th</sup> day  
of November, 1999.

  
Notary Public

KAREN L. LANCASTER  
Notary Public, State of New York  
No. 60-4643659  
Qualified In Westchester County  
Term Expires 9/30/01

**ATTACHMENT I**

**PROPOSED TECHNICAL SPECIFICATION CHANGES**

**CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.  
INDIAN POINT UNIT NO. 2  
DOCKET NO. 50-247  
NOVEMBER, 1999**

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- 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 operable.
  - e. Deleted
  - 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.
3. When RCS temperature is less than or equal to 305°F, the requirements of Table 3.1.A-2 regarding the number of safety injection (SI) pumps allowed to be energized shall be adhered to.

**B. CONTAINMENT COOLING AND IODINE REMOVAL SYSTEMS**

1. The reactor shall not be made critical unless the following conditions are met:
- a. The recirculation fluid pH control system shall be operable with  $\geq 8000$  lbs. (148 cu. ft.) of trisodium phosphate (w/12 hydrates), or equivalent, available in storage baskets in the containment.
  - b. The five fan cooler 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 requirements of 3.3.B.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.B.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 fan cooler unit may be inoperable during normal reactor operation for a period not to exceed 7 days provided both containment spray pumps are operable.
  - b. One containment spray pump may be inoperable during normal reactor operation, for a period not to exceed 72 hours, provided the five fan cooler units and the remaining containment spray pump are operable.

The containment cooling function is provided by two independent systems: (1) fan-coolers and (2) containment spray. During normal power operation, the five fan-coolers are required to remove heat lost from equipment and piping within containment at design conditions (with a cooling water temperature of 95°F)<sup>(12)</sup>. In the event of a Design Basis

Accident, sufficient cooling to reduce containment pressure at a rate consistent with limiting offsite doses to acceptable values is provided by three fan-cooler units and one spray pump. These constitute the minimum safeguards and are capable of being operated on emergency power with one diesel generator inoperable.

The iodine removal function is provided by two independent operating trains of the containment spray system. In the event of a Design Basis Accident, one containment spray pump provides sufficient flow to remove air borne elemental and particulate iodine at a rate consistent with limiting offsite doses to acceptable values.

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.

The operability of the recirculation fluid pH control system ensures that there is sufficient trisodium phosphate (TSP) available in containment to guarantee a sump pH  $\geq 7.0$  during the recirculation phase of a postulated LOCA. This pH level is required to reduce the potential for chloride induced stress corrosion of austenitic stainless steel and assure the retention of iodine in the recirculating fluid. The specified amounts of TSP will result in a recirculation fluid pH between 7.0 and 9.5.

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<sup>(6)</sup>. During the recirculation phase following a loss-of-coolant accident, only one of the three component cooling pumps is required for minimum safeguards<sup>(7)</sup>. With two operable component cooling pumps, 100% redundancy will be provide. 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.

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.

The post-accident venting system is used only in the absence of hydrogen recombiners and only when absolutely necessary. From the standpoint of minimizing offsite radiation doses, the optimum starting time for the venting system, if needed, is the latest possible time after the accident. Consistent with this philosophy, the selected venting initiation point of 3 percent hydrogen maximizes the time period before venting is required while at the same time allows a sufficient margin of safety below the lower flammability limit of hydrogen.

The control room air filtration system is designed to filter the control room atmosphere for intake air during control room isolation conditions. The control room system is designed to automatically start upon control room isolation. Control room isolation is initiated either by a safety injection signal or by detection of high radioactivity in the control room. If the control room air filtration system is found to be inoperable, there is no immediate threat to the control room and reactor operation may continue for a limited period of time while repairs are being made. If the system cannot be repaired within 3.5 days, the reactor is placed in the hot shutdown condition.

The control room ventilation system is equipped with toxic gas detection systems consisting of redundant monitors capable of detecting chlorine and anhydrous ammonia. These toxic gas detection systems are designed to isolate the control room from outside air upon detection of

### **3.8 REFUELING, FUEL STORAGE AND OPERATIONS WITH THE REACTOR VESSEL HEAD BOLTS LESS THAN FULLY TENSIONED**

#### **Specifications**

- A. The following conditions shall be satisfied when fuel is in the reactor vessel and the reactor vessel head bolts are less than fully tensioned:**
- 1. Prior to initial movement of the reactor vessel head, the containment purge supply, exhaust and pressure relief isolation valves, including the radiation monitors which initiate isolation, shall be tested and verified to be operable or the inoperable isolation valves locked closed in accordance with Specification 3.8.B.8.**
  - 2. The core subcritical neutron flux shall be continuously monitored by two source range monitors, each with continuous visual indication in the control room and one with audible indication in the containment available whenever core geometry is being changed (excluding the movement of neutron source bearing assemblies). When core geometry is not being changed, at least one source range neutron flux monitor shall be in service. With both of the required monitors inoperable or not operating, boron concentration of the reactor coolant system shall be determined at least once per 12 hours.**
  - 3. At least one residual heat removal (RHR) pump and heat exchanger shall be operable and in operation when water level is greater than or equal to 23 feet (El. 92'0") above the top of the reactor vessel flange.**
  - 4. When water level is less than 23 feet above the top of the reactor vessel flange, both RHR pumps and RHR heat exchangers shall be operable with at least one of each in operation.**
  - 5. If the requirements of Specification 3.8.A.3 or 3.8.A.4 cannot be satisfied, suspend all operations involving a reduction in boron concentration of the Reactor Coolant System and immediately initiate corrective action to return the required RHR pump(s) and heat exchanger(s) to operable status.**
  - 6. The requirements for RHR pump and heat exchanger operability/operation in Specifications 3.8.A.3 and 3.8.A.4 may be suspended during maintenance, modification, testing, inspection, repair or the performance of core component**

movement in the vicinity of the reactor pressure vessel hot legs. During operation under the provisions of this specification, an alternate means of decay heat removal shall be available when the required number of RHR pump(s) and heat exchanger(s) are not operable. With no RHR pump(s) and heat exchanger(s) operating, the RCS temperature and the source range detectors shall be monitored hourly.

7. The reactor  $T_{avg}$  shall be less than or equal to 140°F.
8. Specification 3.6.A.1 shall be adhered to for reactor subcriticality and containment integrity.

B. With fuel in the reactor vessel and when:

- i) the reactor vessel head is being moved, or
- ii) the upper internals are being moved, or
- iii) loading and unloading fuel from the reactor, or
- iv) heavy loads greater than 2300 lbs (except for installed crane systems) are being moved over the reactor with the reactor vessel head removed,

the following specifications (1) through (12) shall be satisfied:

1. Specification 3.8.A above shall be met.
2. The minimum boron concentration shall be the more restrictive of either  $\geq 2000$ ppm or that which is sufficient to provide a shutdown margin  $\geq 5\% \Delta k/k$ . The required boron concentration shall be verified by chemical analysis daily.
3. Direct communication between the control room and the refueling cavity manipulator crane shall be available whenever changes in core geometry are taking place.
4. No movement of fuel in the reactor shall be made until the reactor has been subcritical for at least 100 hours.
5. A dead-load test shall be successfully performed on the spent fuel pit bridge refueling crane before fuel movement begins. The load assumed by the

refueling crane for this event must be equal to or greater than the maximum load to be assumed by the refueling crane during the refueling operation. A thorough visual inspection of the refueling crane shall be made after the dead-load test and prior to fuel handling.

6. The fuel storage building charcoal filtration system must be operating whenever spent fuel movement is taking place within the spent fuel storage areas unless the spent fuel has had a continuous 35-day decay period.
  7. Radiation levels in the spent fuel storage area shall be monitored continuously whenever spent fuel movement is taking place in that area.
  8. The equipment door, or a closure plate that restricts direct air flow from the containment, shall be properly installed. In addition, at least one isolation valve shall be operable or locked closed in each line penetrating the containment and which provides a direct path from containment atmosphere to the outside.
  9. Radiation levels in containment shall be monitored continuously.
  10. A licensed senior reactor operator shall be at the site and designated in charge of the operation whenever changes in core geometry are taking place.
  11. The minimum water level above the top of the reactor pressure vessel flange shall be at least 23 feet (El. 92'0") whenever movement of spent fuel is taking place inside the containment.
  12. If any of the conditions specified above cannot be met, suspend all operations under this specification (3.8.B). Suspension of operations shall not preclude completion of movement of the above components to a safe conservative position.
- C. The following conditions are applicable to the spent fuel pit any time it contains irradiated fuel:
1. The spent fuel cask shall not be moved over any region of the spent fuel pit until the cask handling system has been reviewed by the Nuclear Regulatory Commission and found to be acceptable. Furthermore, any load in excess of the nominal weight of a spent fuel storage rack and associated handling tool shall

not be moved on or above El. 95' in the Fuel Storage Building. Additionally, loads in excess of the nominal weight of a fuel and control rod assembly and associated handling tool shall not be moved over spent fuel in the spent fuel pit. The weight of installed crane systems shall not be considered part of these loads.

2. The spent fuel storage pit water level shall be maintained at an elevation of at least 93'2". In the event the level decreases below this value, all movement of fuel assemblies in the spent fuel pool storage pit and crane operations with loads over spent fuel in the spent fuel pit shall cease and water level shall be restored to within its limit within 4 hours.

D. The following conditions are applicable to the spent fuel pit anytime it contains fuel:

1. The spent fuel storage racks are categorized as either Region I or Region II as specified in Figure 3.8-2. Fuel assemblies to be stored in the spent fuel storage racks are categorized as either Category A, B or C based on burnup and enrichment limits as specified in Figure 3.8-3. The storage of Category A fuel assemblies within the spent fuel storage racks is unrestricted. Category B fuel assemblies shall only be stored in Region I or in a Region II spent fuel rack cell with one cell wall adjacent to a non-fuel area (a non-fuel area is the cask area or the area on the outside of a rack next to a wall). Category C fuel assemblies shall be stored only in Region I. The one exception to this shall be fuel assembly F-65 which shall be stored in Region I or in a Region II spent fuel rack cell with two cell walls adjacent to non-fuel areas.

In the event any fuel assembly is found to be stored in a configuration other than specified, immediate action shall be initiated to:

- a. Verify the spent fuel storage pit boron concentration meets the requirements of Specification 3.8.D.2, and
  - b. Return the stored fuel assembly to the specified configuration.
2. At all times the spent fuel storage pit boron concentration shall be at least 1500 ppm. With the boron concentration less than this value, all fuel movement within the spent fuel storage pit shall cease and immediate action shall be initiated to restore the boron concentration to at least the minimum specified.
  3. During operations described in Specification 3.8.B, the spent fuel storage pit

boron concentration shall be at least equal to that required in Specification 3.8.B.2. With the boron concentration less than the specified value either:

- a. Isolate the spent fuel storage pit from the refueling cavity, or
- b. Take actions required by Specification 3.8.B.12.

E. Specification 3.0.1 is not applicable to the requirements of Specification 3.8.

#### 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<sup>(1)</sup>. 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 and neutron flux provides immediate indication of an unsafe condition. The residual heat removal pump is used to maintain a uniform boron concentration.

The shutdown margin requirements will keep the core subcritical. During refueling, the reactor refueling cavity is filled with borated water. The minimum boron concentration of this water is the more restrictive of either 2000 ppm or else sufficient to maintain the reactor subcritical by at least 5%  $\Delta k/k$  in the cold shutdown condition with all rods inserted. These limitations are consistent with the initial conditions assumed for the boron dilution incident in the safety analyses. Periodic checks of refueling water boron concentration ensure the proper shutdown margin. The specifications allow the control room operator to inform the manipulator operator of any impending unsafe condition detected from the main control board indicators during fuel movement.

In addition to the above safeguards, interlocks are utilized during refueling to ensure safe handling. An excess weight interlock is provided on the lifting hoist to prevent movement of more than one fuel assembly at a time. The spent fuel transfer mechanism can accommodate only one fuel assembly at a time.

The 100 hour decay time following plant shutdown and the 23 feet of water above the top of the reactor vessel flanges are consistent with the assumptions used in the dose calculations for fuel-handling accidents both inside and outside of the containment. The analysis of the fuel handling accident inside and outside of the containment takes no credit for removal of radioactive iodine by charcoal filters.

The requirement for the fuel storage building charcoal filtration system to be operating when spent fuel movement is being made provides added assurance that the offsite doses will be within acceptable limits in the event of a fuel-handling accident. The additional month of spent fuel decay time will provide the same assurance that the offsite doses are within acceptable limits and therefore the charcoal filtration system would not be required to be operating.

The spent fuel storage pit water level requirement in Specification 3.8.C.2 provides approximately 24 feet of water above fuel assemblies stored in the spent fuel storage racks.

The fuel enrichment and burnup limits in Specification 3.8.D.1 and the boron requirements in Specification 3.8.D.2 assure the limits assumed in the spent fuel storage safety analysis will not be exceeded.

The requirement that at least one RHR pump and heat exchanger be in operation ensures that sufficient cooling capacity is available to maintain reactor coolant temperature below 140°F, and sufficient coolant circulation is maintained through the reactor core to minimize the effect of a boron dilution incident and prevent boron stratification.

The requirement to have two RHR pumps and heat exchangers operable when there is less than 23 feet of water above the vessel flange ensures that a single failure will not result in a complete loss of residual heat removal capability. With the head removed and at least 23 feet of water above the flange, a large heat sink is available for core cooling, thus allowing adequate time to initiate actions to cool the core in the event of a single failure.

The presence of a licensed senior reactor operator at the site and designated in charge provides qualified supervision of the refueling operation during changes in core geometry.

#### References

- (1) FSAR Section 9.5.2

## 4.5 ENGINEERED SAFETY FEATURES

### Applicability

Applies to testing of the Safety Injection System, the Containment Spray System, the Hydrogen Recombiner System, and the Air Filtration System.

### Objective

To verify that the subject systems will respond promptly and perform their design functions, if required.

### Specifications

#### A. SYSTEM TESTS

##### 1. Safety Injection System

- a. System tests shall be performed at each reactor Refueling Interval (#). With the Reactor Coolant System pressure less than or equal to 350 psig and temperature less than or equal to 350°F, a test safety injection signal will be applied to initiate operation of the system. The safety injection pumps are made inoperable for this test.
- b. The test will be considered satisfactory if control board indication and visual observations indicate that all components have received the safety injection signal in the proper sequence and timing; that is, the appropriate pump breakers shall have opened and closed, and the appropriate valves shall have completed their travel.
- c. Conduct a flow test of the high head safety injection system after any modification is made to either its piping and/or valve arrangement.
- d. Verify that the mechanical stops on Valves 856 A, C, D and E are set at the position measured and recorded during the most recent ECCS operational flow test or flow tests performed in accordance with (c) above. This surveillance procedure shall be performed

following any maintenance on these valves or their associated motor operators and at a convenient outage if the position of the mechanical stops has not been verified in the preceding three months.

**B. CONTAINMENT SPRAY SYSTEM**

1. System tests shall be performed at each reactor Refueling Interval (#). The tests shall be performed with the isolation valves in the spray supply lines at the containment blocked closed. Operation of the system is initiated by tripping the normal actuation instrumentation.
2. The spray nozzles shall be tested for proper functioning at least every five years.
3. The test will be considered satisfactory if visual observations indicate all components have operated satisfactorily.

**C. HYDROGEN RECOMBINER SYSTEM**

1. Visual Inspection of both PARs at each refueling outage(#) shall be done to verify that there is no significant fouling by foreign materials.
2. A sample plate from each PAR shall be removed at each refueling outage and tested to verify response to a hydrogen mixture test gas.

**D. CONTAINMENT FAN COOLER SYSTEM**

Each fan cooler unit specified in Specification 3.3.B shall be demonstrated to be operable:

1. At least once monthly by initiating, from the control room, flow through the unit and verifying that the unit operates for at least 15 minutes.
2. At least once every Refueling Interval (#) by verifying a system flow rate at ambient conditions greater than or equal to 64,500 cfm.

**E. CONTROL ROOM AIR FILTRATION SYSTEM**

The control room air filtration system specified in Specification 3.3.H shall be demonstrated to be operable:

1. At least once monthly by initiating, from the control room, flow through the HEPA filters and charcoal adsorbers and verifying that the system operates for at least 15 minutes.
2. At least once every Refueling Interval(#) or (1) after any structural maintenance on the HEPA filter or charcoal adsorber housings, or (2) at any time painting, fire or chemical releases could alter filter integrity by:
  - a. verifying a system flow rate, at ambient conditions, of 2000 cfm  $\pm$ 10% during system operation when tested in accordance with ANSI N510-1975.
  - b. verifying that, with the system operating at ambient conditions and at a flow rate of 2000 CFM  $\pm$ 10% and exhausting through the HEPA filters and charcoal adsorbers, the total bypass flow of the system to the facility vent, including leakage through the system diverting valves, is less than or equal to 1% when the system is tested by admitting cold DOP at the system intake.
  - c. verifying that the system satisfies the in-place testing acceptance criteria and uses the test procedures of Regulatory Positions C.5.a, C.5.c and C.5.d of Regulatory Guide 1.52, Revision 2, March 1978, at ambient conditions and at a flow rate of 2000 cfm  $\pm$ 10%.
  - d. verifying, within 31 days after removal, that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, meets the laboratory testing criteria of Regulatory Position C.6.a of Regulatory Guide 1.52, Revision 2, March 1978.
3. After every 720 hours of charcoal adsorber operation, by verifying within 31 days after removal that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1973, meets the laboratory testing criteria of Regulatory Position C.6.a of Regulatory Guide 1.52, Revision 2, March 1978.

4. At least once every Refueling Interval(#) by:
  - a. verifying that the pressure drop across the combined HEPA filters and charcoal adsorber banks is less than 6 inches water gauge while operating the system at ambient conditions and at a flow rate of 2000 cfm  $\pm 10\%$ .
  - b. verifying that, on a Safety Injection Test Signal or a high radiation signal in the control room, the system automatically switches into a filtered intake mode of operation with flow through the HEPA filters and charcoal adsorber banks. <sup>1</sup>
  - c. verifying that the system maintains the control room at a neutral or positive pressure relative to the adjacent areas during system operation.
5. After each complete or partial replacement of an HEPA filter bank, by verifying that the HEPA filter banks remove greater than or equal to 99% of the DOP when they are tested in-place in accordance with ANSI N510-1975 while operating the system at ambient conditions and at a flow rate of 2000 cfm  $\pm 10\%$ .
6. After each complete or partial replacement of a charcoal adsorber bank, by verifying that the charcoal adsorbers remove greater than or equal to 99.95% of a halogenated hydrocarbon refrigerant test gas when they are tested in-place in accordance with ANSI N510-1975 while operating the system at ambient conditions and at a flow rate of 2000 cfm  $\pm 10\%$ .
7. Each toxic gas detection system shall be demonstrated operable by performance of a channel check at least once per day, a channel test at least once per 31 days and a channel calibration at least once each Refueling Interval(#).

**F. FUEL STORAGE BUILDING AIR FILTRATION SYSTEM**

The fuel storage building air filtration system specified in Specification 3.8 shall be demonstrated operable:

1. At least once per 31 days by initiating, from the control room, flow through the HEPA filters and charcoal adsorbers and verifying that the system operates for at least 15 minutes.

2. At each refueling, prior to refueling operations, or (1) after any structural maintenance on the HEPA filter or charcoal adsorber housings, or (2) at any time painting, fire or chemical releases could alter filter integrity by:
  - a. verifying a system flow rate at ambient conditions of 20,000 cfm  $\pm$ 10% during system operation when tested in accordance with ANSI N510-1975.
  - b. verifying that the system satisfies the in-place testing acceptance criteria and uses the test procedures of Regulatory Positions C.5.a, C.5.c and C.5.d of Regulatory Guide 1.52, Revision 2, March 1978, at ambient conditions and at a flow rate of 20,000 cfm  $\pm$ 10%.
  - c. verifying within 31 days after removal that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, meets the laboratory testing criteria of Regulatory Position C.6.a of Regulatory Guide 1.52, Revision 2, March 1978.
3. Prior to handling spent fuel which has decayed for less than 35 days, verify within 31 days after removal that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, meets the laboratory testing criteria of Regulatory Position C.6.a of Regulatory Guide 1.52, Revision 2, March 1978. Such an analysis is good for 720 hours of charcoal adsorber operation. After 720 hours of operation, if spent fuel with a decay time of less than 35 days is still being handled, a new sample is required along with a new analysis.
4. At each refueling prior to refueling operations by:
  - a. verifying that the pressure drop across the combined HEPA filters and charcoal adsorber banks is less than 6 inches water gauge while operating the system at ambient conditions and at a flow rate of 20,000 cfm  $\pm$ 10%.
  - b. verifying that the system maintains the spent fuel storage pool area at a pressure less than that of the outside atmosphere during system operation.

5. After each complete or partial replacement of a HEPA filter bank, by verifying that the HEPA filter banks remove greater than or equal to 99% of the DOP when they are tested in-place in accordance with ANSI N510-1975 while operating the system at ambient conditions and at a flow rate of 20,000 cfm  $\pm 10\%$ .
6. After each complete or partial replacement of a charcoal adsorber bank, by verifying that the charcoal adsorbers remove greater than or equal to 99.95% of a halogenated hydrocarbon refrigerant test gas when they are tested in-place in accordance with ANSI N510-1975 while operating the system at ambient conditions and at a flow rate of 20,000 cfm  $\pm 10\%$ .

**G. POST-ACCIDENT CONTAINMENT VENTING SYSTEM**

The post-accident containment venting system shall be demonstrated operable:

1. At least once every Refueling Interval(#), or (1) after any structural maintenance on the HEPA filter or charcoal adsorber housings, or (2) at any time painting, fire or chemical releases could alter filter integrity by:
  - a. verifying no flow blockage by passing flow through the filter system.
  - b. verifying that the system satisfies the in-place testing acceptance criteria and uses the test procedures of Regulatory Positions C.5.a, C.5.c and C.5.d of Regulatory Guide 1.52, Revision 2, March 1978, at ambient conditions and at a flow rate of 200 cfm  $\pm 10\%$ .
  - c. at Refueling Intervals (#), verify within 31 days after removal that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, meets the laboratory testing criteria of Regulatory Position C.6.a of Regulatory Guide 1.52, Revision 2, March 1978.
2. After every 720 hours of charcoal adsorber operation, by verifying within 31 days after removal that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, meets the laboratory testing criteria of Regulatory Position C.6.a of Regulatory Guide 1.52, Revision 2, March 1978.

3. At least once every Refueling Interval(#) by:
  - a. verifying that the pressure drop across the combined HEPA filters and charcoal adsorber banks is less than 6 inches water gauge while  
  
operating the system at ambient conditions and at a flow rate of 200 cfm  $\pm 10\%$ .
  - b. verifying that the system valves can be manually opened.
4. After each complete or partial replacement of a HEPA filter bank, by verifying that the HEPA filter banks remove greater than or equal to 99% of the DOP when they are tested in-place in accordance with ANSI N510-1975 while operating the system at ambient conditions and at a flow rate of 200 cfm  $\pm 10\%$ .
5. After each complete or partial replacement of a charcoal adsorber bank, by verifying that the charcoal adsorbers remove greater than or equal to 99.95% of a halogenated hydrocarbon refrigerant test gas when they are tested in-place in accordance with ANSI N510-1975 while operating the system at ambient conditions and at a flow rate of 200 cfm  $\pm 10\%$ .

H. RECIRCULATION FLUID PH CONTROL SYSTEM

1. The recirculation fluid pH control system shall be demonstrated operable each Refueling Interval (#) by visually verifying that:
  - a. The trisodium phosphate storage baskets are in place, and
  - b. they have maintained their integrity, and
  - c. they contain at least the minimum amount of trisodium phosphate.

## Basis

The Safety Injection System and the Containment Spray System are principal plant safeguards that are normally inoperative during reactor operation. Complete systems tests cannot be performed when the reactor is operating because a safety injection signal causes reactor trip, main feedwater isolation and containment isolation, and a Containment Spray System test requires the system to be temporarily disabled. The method of assuring operability of these systems is, therefore, to combine systems tests to be performed during plant refueling shutdowns, with more frequent component tests, which can be performed during reactor operation.

The refueling systems tests demonstrate proper automatic operation of the Safety Injection and Containment Spray Systems. With the pumps blocked from starting, a test signal is applied to initiate automatic action and verification made that the components receive the safety injection signal in the proper sequence. The test demonstrates the operation of the valves, pump circuit breakers, and automatic circuitry<sup>(1)</sup>.

During reactor operation, the instrumentation which is depended on to initiate safety injection and containment spray is generally checked daily and the initiating circuits are tested monthly (in accordance with Specification 4.1). The testing of the analog channel input is accomplished in the same manner as for the reactor protection system. The engineered safety features logic system is tested by means of test switches to simulate inputs from the analog channels. Test switches are also provided down stream of the master relay output contacts. The purpose of these test switches is to prevent actuation of engineered safety features equipment during testing. Verification that the logic is accomplished is indicated by the matrix test light and/or master relay operation.

Other systems that are also important to the emergency cooling function are the accumulators, the Component Cooling System, the Service Water System and the containment fan coolers. The accumulators are a passive safeguard. In accordance with Specification 4.1, the water volume and pressure in the accumulators are checked periodically. The other systems mentioned operate when the reactor is in operation and, by these means, are continuously monitored for satisfactory performance.

For the four flow distribution valves (856 A, C, D and E), verification of the valve mechanical stop adjustments is performed periodically to provide assurance that the high head safety injection flow distribution is in accordance with flow values assumed in the core cooling analysis.

The hydrogen recombiner system is an engineered safety feature which would function following a loss-of-coolant accident to control the hydrogen evolved in the containment. The passive autocatalytic recombiners (PARs) contain no control or support equipment which would require surveillance. No specific degradation mechanism has yet been identified for the catalysts plates in standby service. Periodic visual examination and cleaning if necessary is done to prevent significant gas blockage by dust or debris. Representative plates are periodically removed and their response to a nominal 1% hydrogen gas mixture is evaluated for evidence of unexpected degradation.

The biannual testing of the containment atmosphere sampling system will demonstrate the availability of this system.

The recirculation fluid pH control system is a passive safeguard with the baskets of trisodium phosphate located in the containment sump area. Periodic visual inspections are required (Refueling#) to verify the storage baskets are in place, have maintained their integrity, and filled with trisodium phosphate.

The control room air filtration system is designed to filter the control room atmosphere for intake air during control room isolation conditions. The control room air filtration system is designed to automatically start upon control room isolation. High-efficiency particulate absolute (HEPA) filters are installed upstream of the charcoal adsorbers to prevent clogging of these adsorbers. The charcoal adsorbers are installed to reduce the potential intake of radioiodine by control room personnel. The required in-place testing and the laboratory charcoal sample testing of the HEPA filters and charcoal adsorbers will provide assurance that Criterion 19 of the General Design Criteria for Nuclear Power Plants, Appendix A to 10 CFR Part 50 continues to be met.

The fuel storage building air filtration system is designed to filter the discharge of the fuel storage building atmosphere to the plant vent. This air filtration system is designed to start automatically upon a high radiation signal. Upon initiation, isolation dampers in the ventilation system are designed to close to redirect air flow through the air treatment system. HEPA filters and charcoal adsorbers are installed to reduce potential releases of radioactive material to the atmosphere. Nevertheless, as required by Specification 3.8.B.6, the fuel storage building air filtration system must be operating whenever spent fuel is being moved unless the spent fuel has had a continuous 35-day decay period. The required in-place testing and the laboratory charcoal sample testing of the HEPA filters and charcoal adsorbers will provide added assurance that the criteria of 10 CFR 100 continue to be met.

The post-accident containment venting system may be used in lieu of hydrogen recombiners for removal of combustible hydrogen from the containment building atmosphere following a design basis accident. As was the case for hydrogen recombiner use, this system is not expected to be needed until approximately 13 days have elapsed following the accident. Use of the system will be based upon containment atmosphere sample analysis and availability of the hydrogen recombiners. When in use, HEPA filters and charcoal adsorbers will filter the containment atmosphere discharge prior to release to the plant vent. The required in-place testing and laboratory charcoal sample testing will verify operability of this venting system and provide further assurance that releases to the environment will be minimized.

As indicated for the previously mentioned engineered safety feature (ESF) air filtration systems, high-efficiency particulate absolute (HEPA) filters are installed upstream of the charcoal adsorbers to prevent clogging of these adsorbers. The charcoal adsorbers are installed to reduce the potential release of radioiodine to the environment. The laboratory charcoal sample testing periodically verifies that the charcoal meets the iodine removal efficiency requirements of Regulatory Guide 1.52, Revision 2. Should the charcoal of any of these filtration systems fail to

satisfy the specified test acceptance criteria, the charcoal will be replaced with new charcoal which satisfies the requirements for new charcoal outlined in Regulatory Guide 1.52, Revision 2.

#### References

- (1) UFSAR Section 6.2
- (2) UFSAR Section 6.4

1. In this instance Refueling Interval is defined by R#.

## 5.2 CONTAINMENT

### Applicability

Applies to those design features of the Containment System relating to operational and public safety.

### Objective

To define the significant design features of the reactor containment structure.

### Specifications

#### A. REACTOR CONTAINMENT

1. The reactor containment completely encloses the entire reactor and reactor coolant system and ensures that an acceptable upper limit for leakage of radioactive materials to the environment is not exceeded even if gross failure of the reactor coolant system occurs. The structure provides biological shielding for both normal and accident situations.
2. The containment structure is designed for an internal pressure of 47 psig, plus the loads resulting from an earthquake producing 0.10g applied horizontally and 0.05g applied vertically at the same time<sup>(1)</sup>. The containment is also structurally designed to withstand an external pressure 2.5 psig higher than the internal pressure.

#### B. PENETRATIONS

1. All penetrations through the containment reinforced concrete pressure barrier for pipe, electrical conductors, ducts and access hatches are of the double barrier type<sup>(2)</sup>.
2. The automatic Phase A containment isolation (trip) valves are actuated to the closed position either manually or by an automatically-derived safety injection signal. The automatic Phase B containment isolation valves are tripped closed by automatic or manual containment spray actuation. The actuation system is designed such that no single component failure will prevent containment isolation if required.

C. CONTAINMENT SYSTEMS

1. The containment vessel has an internal spray system which is capable of providing a distributed borated water spray of at least 2200 gpm. During the initial period of spray operation, sodium hydroxide would be added to the spray water to increase the removal of iodine from the containment atmosphere<sup>(3)</sup>.
2. The containment vessel has an internal air recirculation system which includes five fan-cooler units (centrifugal fans and water cooled heat exchangers), with a total heat removal capability of at least 308.5 MBtu/hr under conditions following a loss-of-coolant accident and at service water temperature of 95°F.<sup>(4)</sup>

References

- (1) UFSAR Section 5.1.2.2
- (2) UFSAR Section 5.1.4
- (3) UFSAR Section 6.3
- (4) UFSAR Section 6.4

**ATTACHMENT II**

**PROPOSED TECHNICAL SPECIFICATION MARKED-UP PAGES**

**CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.  
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- 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 operable.
  - e. Deleted
  - 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.
3. When RCS temperature is less than or equal to 305°F, the requirements of Table 3.1.A-2 regarding the number of safety injection (SI) pumps allowed to be energized shall be adhered to.

**B. CONTAINMENT COOLING AND IODINE REMOVAL SYSTEMS**

1. The reactor shall not be made critical unless the following conditions are met:
- a. The recirculation fluid pH control system shall be operable with  $\geq 8000$  lbs. (148 cu. ft.) of trisodium phosphate (w/12 hydrates), or equivalent, available in storage baskets in the containment.
  - 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 requirements of 3.3.B.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.B.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 fan cooler unit may be inoperable during normal reactor operation for a period not to exceed 7 days provided both containment spray pumps are operable.
  - b. One containment spray pump may be inoperable during normal reactor operation, for a period not to exceed 72 hours, provided the five fan cooler units and the remaining containment spray pump are operable.

The containment cooling function is provided by two independent systems: (1) fan-coolers plus charcoal filters and (2) containment spray. During normal power operation, the five fan-coolers are required to remove heat lost from equipment and piping within containment at design conditions (with a cooling water temperature of 95°F)<sup>(12)</sup>. In the event of a Design Basis

Accident, sufficient cooling to reduce containment pressure at a rate consistent with limiting offsite doses to acceptable values is provided by three fan-cooler units and one spray pump. These constitute the minimum safeguards and are capable of being operated on emergency power with one diesel generator inoperable.

The iodine removal function is provided by two independent operating trains of the containment spray system. In the event of a Design Basis Accident, one containment spray pump provides sufficient flow to remove air borne elemental and particulate iodine at a rate consistent with limiting offsite doses to acceptable values.

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.

The operability of the recirculation fluid pH control system ensures that there is sufficient trisodium phosphate (TSP) available in containment to guarantee a sump pH  $\geq 7.0$  during the recirculation phase of a postulated LOCA. This pH level is required to reduce the potential for chloride induced stress corrosion of austenitic stainless steel and assure the retention of iodine in the recirculating fluid. The specified amounts of TSP will result in a recirculation fluid pH between 7.0 and 9.5.

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<sup>(6)</sup>. During the recirculation phase following a loss-of-coolant accident, only one of the three component cooling pumps is required for minimum safeguards<sup>(7)</sup>. With two operable component cooling pumps, 100% redundancy will be provide. 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.

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.

The post-accident venting system is used only in the absence of hydrogen recombiners and only when absolutely necessary. From the standpoint of minimizing offsite radiation doses, the optimum starting time for the venting system, if needed, is the latest possible time after the accident. Consistent with this philosophy, the selected venting initiation point of 3 percent hydrogen maximizes the time period before venting is required while at the same time allows a sufficient margin of safety below the lower flammability limit of hydrogen.

The control room air filtration system is designed to filter the control room atmosphere for intake air ~~and/or for recirculation~~ during control room isolation conditions. The control room system is designed to automatically start upon control room isolation. Control room isolation is initiated either by a safety injection signal or by detection of high radioactivity in the control room. If the control room air filtration system is found to be inoperable, there is no immediate threat to the control room and reactor operation may continue for a limited period of time while repairs are being made. If the system cannot be repaired within 3.5 days, the reactor is placed in the hot shutdown condition.

The control room ventilation system is equipped with toxic gas detection systems consisting of redundant monitors capable of detecting chlorine and anhydrous ammonia. These toxic gas detection systems are designed to isolate the control room from outside air upon detection of

movement in the vicinity of the reactor pressure vessel hot legs. During operation under the provisions of this specification, an alternate means of decay heat removal shall be available when the required number of RHR pump(s) and heat exchanger(s) are not operable. With no RHR pump(s) and heat exchanger(s) operating, the RCS temperature and the source range detectors shall be monitored hourly.

7. The reactor  $T_{avg}$  shall be less than or equal to 140°F.
8. Specification 3.6.A.1 shall be adhered to for reactor subcriticality and containment integrity.

B. With fuel in the reactor vessel and when:

- i) the reactor vessel head is being moved, or
- ii) the upper internals are being moved, or
- iii) loading and unloading fuel from the reactor, or
- iv) heavy loads greater than 2300 lbs (except for installed crane systems) are being moved over the reactor with the reactor vessel head removed,

the following specifications (1) through (12) shall be satisfied:

1. Specification 3.8.A above shall be met.
2. The minimum boron concentration shall be the more restrictive of either  $\geq 2000$ ppm or that which is sufficient to provide a shutdown margin  $\geq 5\% \Delta k/k$ . The required boron concentration shall be verified by chemical analysis daily.
3. Direct communication between the control room and the refueling cavity manipulator crane shall be available whenever changes in core geometry are taking place.
4. No movement of fuel in the reactor shall be made until the reactor has been subcritical for at least ~~474~~100 hours.
5. A dead-load test shall be successfully performed on the spent fuel pit bridge refueling crane before fuel movement begins. The load assumed by the

refueling crane for this event must be equal to or greater than the maximum load to be assumed by the refueling crane during the refueling operation. A thorough visual inspection of the refueling crane shall be made after the dead-load test and prior to fuel handling.

6. The fuel storage building charcoal filtration system must be operating whenever spent fuel movement is taking place within the spent fuel storage areas unless the spent fuel has had a continuous 35-day decay period.
7. Radiation levels in the spent fuel storage area shall be monitored continuously whenever spent fuel movement is taking place in that area.
8. The equipment door, or a closure plate that restricts direct air flow from the containment, ~~and at least one personnel door in the equipment door or closure plate and in the personnel air lock shall be properly closed~~*installed*. In addition, at least one isolation valve shall be operable or locked closed in each line penetrating the containment and which provides a direct path from containment atmosphere to the outside.
9. Radiation levels in containment shall be monitored continuously.
10. A licensed senior reactor operator shall be at the site and designated in charge of the operation whenever changes in core geometry are taking place.
11. The minimum water level above the top of the reactor pressure vessel flange shall be at least 23 feet (El. 92'0") whenever movement of spent fuel is taking place inside the containment.
12. If any of the conditions specified above cannot be met, suspend all operations under this specification (3.8.B). Suspension of operations shall not preclude completion of movement of the above components to a safe conservative position.

C. The following conditions are applicable to the spent fuel pit any time it contains irradiated fuel:

1. The spent fuel cask shall not be moved over any region of the spent fuel pit until the cask handling system has been reviewed by the Nuclear Regulatory Commission and found to be acceptable. Furthermore, any load in excess of the nominal weight of a spent fuel storage rack and associated handling tool shall

3. During operations described in Specification 3.8.B, the spent fuel storage pit boron concentration shall be at least equal to that required in Specification 3.8.B.2. With the boron concentration less than the specified value either:
- a. Isolate the spent fuel storage pit from the refueling cavity, or
  - b. Take actions required by Specification 3.8.B.12.

E. Specification 3.0.1 is not applicable to the requirements of Specification 3.8.

#### 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<sup>(1)</sup>. 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 and neutron flux provides immediate indication of an unsafe condition. The residual heat removal pump is used to maintain a uniform boron concentration.

The shutdown margin requirements will keep the core subcritical. During refueling, the reactor refueling cavity is filled with borated water. The minimum boron concentration of this water is the more restrictive of either 2000 ppm or else sufficient to maintain the reactor subcritical by at least 5%  $\Delta k/k$  in the cold shutdown condition with all rods inserted. These limitations are consistent with the initial conditions assumed for the boron dilution incident in the safety analyses. Periodic checks of refueling water boron concentration ensure the proper shutdown margin. The specifications allow the control room operator to inform the manipulator operator of any impending unsafe condition detected from the main control board indicators during fuel movement.

In addition to the above safeguards, interlocks are utilized during refueling to ensure safe handling. An excess weight interlock is provided on the lifting hoist to prevent movement of more than one fuel assembly at a time. The spent fuel transfer mechanism can accommodate only one fuel assembly at a time.

The ~~474~~100 hour decay time following plant shutdown and the 23 feet of water above the top of the reactor vessel flanges are consistent with the assumptions used in the dose calculations for fuel-handling accidents both inside *and outside* of the containment. The analysis of the fuel handling accident inside and outside of the containment is based on an atmospheric dispersion

factor ( $X/Q$ ) of  $5.1 \times 10^{-4}$  sec/m<sup>3</sup> and takes no credit for removal of radioactive iodine by charcoal filters.

The requirement for the fuel storage building charcoal filtration system to be operating when spent fuel movement is being made provides added assurance that the offsite doses will be within acceptable limits in the event of a fuel-handling accident. The additional month of spent fuel decay time will provide the same assurance that the offsite doses are within acceptable limits and therefore the charcoal filtration system would not be required to be operating.

The spent fuel storage pit water level requirement in Specification 3.8.C.2 provides approximately 24 feet of water above fuel assemblies stored in the spent fuel storage racks.

The fuel enrichment and burnup limits in Specification 3.8.D.1 and the boron requirements in Specification 3.8.D.2 assure the limits assumed in the spent fuel storage safety analysis will not be exceeded.

The requirement that at least one RHR pump and heat exchanger be in operation ensures that sufficient cooling capacity is available to maintain reactor coolant temperature below 140°F, and sufficient coolant circulation is maintained through the reactor core to minimize the effect of a boron dilution incident and prevent boron stratification.

The requirement to have two RHR pumps and heat exchangers operable when there is less than 23 feet of water above the vessel flange ensures that a single failure will not result in a complete loss of residual heat removal capability. With the head removed and at least 23 feet of water above the flange, a large heat sink is available for core cooling, thus allowing adequate time to initiate actions to cool the core in the event of a single failure.

The presence of a licensed senior reactor operator at the site and designated in charge provides qualified supervision of the refueling operation during changes in core geometry.

#### References

- (1) FSAR Section 9.5.2

## 4.5 ENGINEERED SAFETY FEATURES

### Applicability

Applies to testing of the Safety Injection System, the Containment Spray System, the Hydrogen Recombiner System, and the Air Filtration System.

### Objective

To verify that the subject systems will respond promptly and perform their design functions, if required.

### Specifications

#### A. SYSTEM TESTS

##### 1. Safety Injection System

- a. System tests shall be performed at each reactor Refueling Interval (#). With the Reactor Coolant System pressure less than or equal to 350 psig and temperature less than or equal to 350°F, a test safety injection signal will be applied to initiate operation of the system. The safety injection pumps are made inoperable for this test.
- b. The test will be considered satisfactory if control board indication and visual observations indicate that all components have received the safety injection signal in the proper sequence and timing; that is, the appropriate pump breakers shall have opened and closed, and the appropriate valves shall have completed their travel.
- c. Conduct a flow test of the high head safety injection system after any modification is made to either its piping and/or valve arrangement.
- d. Verify that the mechanical stops on Valves 856 A, C, D and E are set at the position measured and recorded during the most recent ECCS operational flow test or flow tests performed in accordance with (c) above. This surveillance procedure shall be performed

following any maintenance on these valves or their associated motor operators and at a convenient outage if the position of the mechanical stops has not been verified in the preceding three months.

**B. CONTAINMENT SPRAY SYSTEM**

1. System tests shall be performed at each reactor Refueling Interval (#). The tests shall be performed with the isolation valves in the spray supply lines at the containment blocked closed. Operation of the system is initiated by tripping the normal actuation instrumentation.
2. The spray nozzles shall be tested for proper functioning at least every five years.
3. The test will be considered satisfactory if visual observations indicate all components have operated satisfactorily.

**C. HYDROGEN RECOMBINER SYSTEM**

1. Visual Inspection of both PARs at each refueling outage(#) shall be done to verify that there is no significant fouling by foreign materials.
2. A sample plate from each PAR shall be removed at each refueling outage and tested to verify response to a hydrogen mixture test gas.

**D. CONTAINMENT AIR FILTRATION FAN COOLER SYSTEM**

Each ~~air fan filtration cooler~~ unit specified in Specification 3.3.B shall be demonstrated to be operable:

1. At least once ~~per 31 days~~ *monthly* by initiating, from the control room, flow through the ~~HEPA filters and charcoal adsorbers~~ *unit* and verifying that the unit operates for at least 15 minutes.
2. At least once every Refueling Interval (#), by verifying a system flow rate at ambient conditions greater than or equal to ~~65,60 ± 10%~~ *64,500 cfm*. ~~or (1) after any structural maintenance on the HEPA filters or charcoal adsorber housings, or (2) at any time painting, fire or chemical releases could alter filter integrity by:~~
  - a. ~~verifying a system flow rate at~~
  - b. ~~verifying that the HEPA filters and/or charcoal adsorbers satisfy the in-place testing acceptance criteria and uses the test procedures of Regulatory Positions C.5.a and C.5.c of Regulatory Guide 1.52, Revision 2, March 1978, at ambient conditions~~

and at a flow rate of 65,600 cfm  $\pm 10\%$  for the HEPA filters.

- ~~e. verifying within 31 days after removal that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, meets the laboratory testing criteria of Regulatory Position C.6.a (except for Position C.6.a(1)) of Regulatory Guide 1.52, Revision 2, March 1978.~~
- ~~3. After every 720 hours of charcoal adsorber operation, by verifying within 31 days after removal that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, meets the laboratory testing criteria of Regulatory Position C.6.a (except for Position C.6.a(1)) of Regulatory Guide 1.52, Revision 2, March 1978.~~
- ~~4. At least once every Refueling Interval (#) by:
  - ~~a. Verifying that the pressure drop across the moisture separator and HEPA filters is less than 6 inches Water Gauge while operating the filtration unit at ambient conditions and at a flow rate of 65,600 cfm  $\pm 10\%$ .~~
  - ~~b. Verifying that the unit starts automatically on a Safety Injection Test Signal.~~~~
- ~~5. After each complete or partial replacement of a HEPA filter bank, by verifying that the HEPA filter banks remove greater than or equal to 99% of the DOP when they are tested in place in accordance with ANSI N510-1975 while operating the unit at ambient conditions and at a flow rate of 65,600 cfm  $\pm 10\%$ .~~
- ~~6. After each complete or partial replacement of a charcoal adsorber bank, verify that the flow rate through the charcoal adsorbers is  $\geq 8,000$  cfm when the system is operating at ambient conditions and a flow rate of 65,600 cfm  $\pm 10\%$  when tested in accordance with ANSI N510-1975.~~

#### **E. CONTROL ROOM AIR FILTRATION SYSTEM**

The control room air filtration system specified in Specification 3.3.H shall be

demonstrated to be operable:

1. At least once ~~per 31 days~~ **monthly** by initiating, from the control room, flow through the HEPA filters and charcoal adsorbers and verifying that the system operates for at least 15 minutes.
2. At least once every Refueling Interval(#) or (1) after any structural maintenance on the HEPA filter or charcoal adsorber housings, or (2) at any time painting, fire or chemical releases could alter filter integrity by:
  - a. verifying a system flow rate, at ambient conditions, of ~~4840~~**2000** cfm  $\pm 10\%$  during system operation when tested in accordance with ANSI N510-1975.
  - b. verifying that, with the system operating at ambient conditions and at a flow rate of ~~4840~~**2000** CFM  $\pm 10\%$  and exhausting through the HEPA filters and charcoal adsorbers, the total bypass flow of the system to the facility vent, including leakage through the system diverting valves, is less than or equal to 1% when the system is tested by admitting cold DOP at the system intake.
  - c. verifying that the system satisfies the in-place testing acceptance criteria and uses the test procedures of Regulatory Positions C.5.a, C.5.c and C.5.d of Regulatory Guide 1.52, Revision 2, March 1978, at ambient conditions and at a flow rate of ~~4840~~**2000** cfm  $\pm 10\%$ .
  - d. verifying, within 31 days after removal, that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, meets the laboratory testing criteria of Regulatory Position C.6.a of Regulatory Guide 1.52, Revision 2, March 1978.
3. After every 720 hours of charcoal adsorber operation, by verifying within 31 days after removal that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1973, meets the laboratory testing criteria of Regulatory Position C.6.a of Regulatory Guide 1.52, Revision 2, March 1978.
4. At least once every Refueling Interval(#) by:
  - a. verifying that the pressure drop across the combined HEPA filters and

charcoal adsorber banks is less than 6 inches water gauge while operating the system at ambient conditions and at a flow rate of ~~4840~~2000 cfm  $\pm 10\%$ .

- b. verifying that, on a Safety Injection Test Signal or a high radiation signal in the control room, the system automatically switches into a ~~recirculation~~*filtered Intake*- mode of operation with flow through the HEPA filters and charcoal adsorber banks. <sup>1</sup>
  - c. verifying that the system maintains the control room at a neutral or positive pressure relative to the ~~outside atmosphere~~*adjacent areas* during system operation.
5. After each complete or partial replacement of an HEPA filter bank, by verifying that the HEPA filter banks remove greater than or equal to 99% of the DOP when they are tested in-place in accordance with ANSI N510-1975 while operating the system at ambient conditions and at a flow rate of ~~4840~~2000 cfm  $\pm 10\%$ .
  6. After each complete or partial replacement of a charcoal adsorber bank, by verifying that the charcoal adsorbers remove greater than or equal to 99.95% of a halogenated hydrocarbon refrigerant test gas when they are tested in-place in accordance with ANSI N510-1975 while operating the system at ambient conditions and at a flow rate of ~~4840~~2000 cfm  $\pm 10\%$ .
  7. Each toxic gas detection system shall be demonstrated operable by performance of a channel check at least once per day, a channel test at least once per 31 days and a channel calibration at least once each Refueling Interval(#).

#### F. FUEL STORAGE BUILDING AIR FILTRATION SYSTEM

The fuel storage building air filtration system specified in Specification 3.8 shall be demonstrated operable:

1. At least once per 31 days by initiating, from the control room, flow through the HEPA filters and charcoal adsorbers and verifying that the system operates for at least 15 minutes.

2. At each refueling, prior to refueling operations, or (1) after any structural maintenance on the HEPA filter or charcoal adsorber housings, or (2) at any time painting, fire or chemical releases could alter filter integrity by:
  - a. verifying a system flow rate at ambient conditions of 20,000 cfm  $\pm$ 10% during system operation when tested in accordance with ANSI N510-1975.
  - b. verifying that the system satisfies the in-place testing acceptance criteria and uses the test procedures of Regulatory Positions C.5.a, C.5.c and C.5.d of Regulatory Guide 1.52, Revision 2, March 1978, at ambient conditions and at a flow rate of 20,000 cfm  $\pm$ 10%.
  - c. verifying within 31 days after removal that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, meets the laboratory testing criteria of Regulatory Position C.6.a of Regulatory Guide 1.52, Revision 2, March 1978.
3. Prior to handling spent fuel which has decayed for less than 35 days, verify within 31 days after removal that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, meets the laboratory testing criteria of Regulatory Position C.6.a of Regulatory Guide 1.52, Revision 2, March 1978. Such an analysis is good for 720 hours of charcoal adsorber operation. After 720 hours of operation, if spent fuel with a decay time of less than 35 days is still being handled, a new sample is required along with a new analysis.
4. At each refueling prior to refueling operations by:
  - a. verifying that the pressure drop across the combined HEPA filters and charcoal adsorber banks is less than 6 inches water gauge while operating the system at ambient conditions and at a flow rate of 20,000 cfm  $\pm$ 10%.
  - b. verifying that the system maintains the spent fuel storage pool area at a pressure less than that of the outside atmosphere during system operation.

5. After each complete or partial replacement of a HEPA filter bank, by verifying that the HEPA filter banks remove greater than or equal to 99% of the DOP when they are tested in-place in accordance with ANSI N510-1975 while operating the system at ambient conditions and at a flow rate of 20,000 cfm  $\pm 10\%$ .
6. After each complete or partial replacement of a charcoal adsorber bank, by verifying that the charcoal adsorbers remove greater than or equal to 99.95% of a halogenated hydrocarbon refrigerant test gas when they are tested in-place in accordance with ANSI N510-1975 while operating the system at ambient conditions and at a flow rate of 20,000 cfm  $\pm 10\%$ .

**G. POST-ACCIDENT CONTAINMENT VENTING SYSTEM**

The post-accident containment venting system shall be demonstrated operable:

1. At least once every Refueling Interval(#), or (1) after any structural maintenance on the HEPA filter or charcoal adsorber housings, or (2) at any time painting, fire or chemical releases could alter filter integrity by:
  - a. verifying no flow blockage by passing flow through the filter system.
  - b. verifying that the system satisfies the in-place testing acceptance criteria and uses the test procedures of Regulatory Positions C.5.a, C.5.c and C.5.d of Regulatory Guide 1.52, Revision 2, March 1978, at ambient conditions and at a flow rate of 200 cfm  $\pm 10\%$ .
  - c. at Refueling Intervals (#), verify within 31 days after removal that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, meets the laboratory testing criteria of Regulatory Position C.6.a of Regulatory Guide 1.52, Revision 2, March 1978.
2. After every 720 hours of charcoal adsorber operation, by verifying within 31 days after removal that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, meets the laboratory testing criteria of Regulatory Position C.6.a of Regulatory Guide 1.52, Revision 2, March 1978.

3. At least once every Refueling Interval(#) by:
  - a. verifying that the pressure drop across the combined HEPA filters and charcoal adsorber banks is less than 6 inches water gauge while  
  
operating the system at ambient conditions and at a flow rate of 200 cfm  $\pm 10\%$ .
  - b. verifying that the system valves can be manually opened.
4. After each complete or partial replacement of a HEPA filter bank, by verifying that the HEPA filter banks remove greater than or equal to 99% of the DOP when they are tested in-place in accordance with ANSI N510-1975 while operating the system at ambient conditions and at a flow rate of 200 cfm  $\pm 10\%$ .
5. After each complete or partial replacement of a charcoal adsorber bank, by verifying that the charcoal adsorbers remove greater than or equal to 99.95% of a halogenated hydrocarbon refrigerant test gas when they are tested in-place in accordance with ANSI N510-1975 while operating the system at ambient conditions and at a flow rate of 200 cfm  $\pm 10\%$ .

#### H. RECIRCULATION FLUID PH CONTROL SYSTEM

1. The recirculation fluid pH control system shall be demonstrated operable each Refueling Interval (#) by visually verifying that:
  - a. The trisodium phosphate storage baskets are in place, and
  - b. they have maintained their integrity, and
  - c. they contain at least the minimum amount of trisodium phosphate.

• Basis

The Safety Injection System and the Containment Spray System are principal plant safeguards that are normally inoperative during reactor operation. Complete systems tests cannot be performed when the reactor is operating because a safety injection signal causes reactor trip, main feedwater isolation and containment isolation, and a Containment Spray System test requires the system to be temporarily disabled. The method of assuring operability of these systems is, therefore, to combine systems tests to be performed during plant refueling shutdowns, with more frequent component tests, which can be performed during reactor operation.

The refueling systems tests demonstrate proper automatic operation of the Safety Injection and Containment Spray Systems. With the pumps blocked from starting, a test signal is applied to initiate automatic action and verification made that the components receive the safety injection signal in the proper sequence. The test demonstrates the operation of the valves, pump circuit breakers, and automatic circuitry<sup>(1)</sup>.

During reactor operation, the instrumentation which is depended on to initiate safety injection and containment spray is generally checked daily and the initiating circuits are tested monthly (in accordance with Specification 4.1). The testing of the analog channel input is accomplished in the same manner as for the reactor protection system. The engineered safety features logic system is tested by means of test switches to simulate inputs from the analog channels. Test switches are also provided down stream of the master relay output contacts. The purpose of these test switches is to prevent actuation of engineered safety features equipment during testing. Verification that the logic is accomplished is indicated by the matrix test light and/or master relay operation.

Other systems that are also important to the emergency cooling function are the accumulators, the Component Cooling System, the Service Water System and the containment fan coolers. The accumulators are a passive safeguard. In accordance with Specification 4.1, the water volume and pressure in the accumulators are checked periodically. The other systems mentioned operate when the reactor is in operation and, by these means, are continuously monitored for satisfactory performance.

For the four flow distribution valves (856 A, C, D and E), verification of the valve mechanical stop adjustments is performed periodically to provide assurance that the high head safety injection flow distribution is in accordance with flow values assumed in the core cooling analysis.

- The hydrogen recombiner system is an engineered safety feature which would function following a loss-of-coolant accident to control the hydrogen evolved in the containment. The passive autocatalytic recombiners (PARs) contain no control or support equipment which would require surveillance. No specific degradation mechanism has yet been identified for the catalysts plates in standby service. Periodic visual examination and cleaning if necessary is done to prevent significant gas blockage by dust or debris. Representative plates are periodically removed and their response to a nominal 1% hydrogen gas mixture is evaluated for evidence of unexpected degradation.

The biannual testing of the containment atmosphere sampling system will demonstrate the availability of this system.

The recirculation fluid pH control system is a passive safeguard with the baskets of trisodium phosphate located in the containment sump area. Periodic visual inspections are required (Refueling#) to verify the storage baskets are in place, have maintained their integrity, and filled with trisodium phosphate.

~~The charcoal portion of the in-containment air recirculation system is a passive safeguard which is isolated from the cooling air flow during normal reactor operation. Hence the charcoal should have a long useful lifetime. The filter frames that house the charcoal are stainless steel and should also last indefinitely. However, the required periodic visual inspections will verify that this is the case. The iodine removal efficiency cannot be measured with the filter cells in place. Therefore, at periodic intervals a representative sample of charcoal is to be removed and tested to verify that the efficiency for removal of methyl iodide is obtained<sup>(2)</sup>. Such laboratory charcoal sample testing together with the specified in-place testing of the HEPA filters will provide further assurance that the criteria of 10 CFR 100 continue to be met.~~

The control room air filtration system is designed to filter the control room atmosphere for intake air and/or for recirculation during control room isolation conditions. The control room air filtration system is designed to automatically start upon control room isolation. High-efficiency particulate absolute (HEPA) filters are installed upstream of the charcoal adsorbers to prevent clogging of these adsorbers. The charcoal adsorbers are installed to reduce the potential intake of radioiodine by control room personnel. The required in-place testing and the laboratory charcoal sample testing of the HEPA filters and charcoal adsorbers will provide assurance that Criterion 19 of the General Design Criteria for Nuclear Power Plants, Appendix A to 10 CFR Part 50 continues to be met.

The fuel storage building air filtration system is designed to filter the discharge of the fuel storage building atmosphere to the plant vent. This air filtration system is designed to start automatically upon a high radiation signal. Upon initiation, isolation dampers in the ventilation

system are designed to close to redirect air flow through the air treatment system. HEPA filters and charcoal adsorbers are installed to reduce potential releases of radioactive material to the atmosphere. Nevertheless, as required by Specification 3.8.B.6, the fuel storage building air filtration system must be operating whenever spent fuel is being moved unless the spent fuel has had a continuous 35-day decay period. The required in-place testing and the laboratory charcoal sample testing of the HEPA filters and charcoal adsorbers will provide added assurance that the criteria of 10 CFR 100 continue to be met.

The post-accident containment venting system may be used in lieu of hydrogen recombiners for removal of combustible hydrogen from the containment building atmosphere following a design basis accident. As was the case for hydrogen recombiner use, this system is not expected to be needed until approximately 13 days have elapsed following the accident. Use of the system will be based upon containment atmosphere sample analysis and availability of the hydrogen recombiners. When in use, HEPA filters and charcoal adsorbers will filter the containment atmosphere discharge prior to release to the plant vent. The required in-place testing and laboratory charcoal sample testing will verify operability of this venting system and provide further assurance that releases to the environment will be minimized.

As indicated for the previously mentioned engineered safety feature (ESF) air filtration systems, high-efficiency particulate absolute (HEPA) filters are installed upstream of the charcoal adsorbers to prevent clogging of these adsorbers. The charcoal adsorbers are installed to reduce the potential release of radioiodine to the environment. The laboratory charcoal sample testing periodically verifies that the charcoal meets the iodine removal efficiency requirements of Regulatory Guide 1.52, Revision 2. Should the charcoal of any of these filtration systems fail to

satisfy the specified test acceptance criteria, the charcoal will be replaced with new charcoal which satisfies the requirements for new charcoal outlined in Regulatory Guide 1.52, Revision 2.

#### References

- (1) UFSAR Section 6.2
- (2) UFSAR Section 6.4

1. In this instance Refueling Interval is defined by R#.

## 5.2 CONTAINMENT

### Applicability

Applies to those design features of the Containment System relating to operational and public safety.

### Objective

To define the significant design features of the reactor containment structure.

### Specifications

#### A. REACTOR CONTAINMENT

1. The reactor containment completely encloses the entire reactor and reactor coolant system and ensures that an acceptable upper limit for leakage of radioactive materials to the environment is not exceeded even if gross failure of the reactor coolant system occurs. The structure provides biological shielding for both normal and accident situations.
2. The containment structure is designed for an internal pressure of 47 psig, plus the loads resulting from an earthquake producing 0.10g applied horizontally and 0.05g applied vertically at the same time<sup>(1)</sup>. The containment is also structurally designed to withstand an external pressure 2.5 psig higher than the internal pressure.

#### B. PENETRATIONS

1. All penetrations through the containment reinforced concrete pressure barrier for pipe, electrical conductors, ducts and access hatches are of the double barrier type<sup>(2)</sup>.
2. The automatic Phase A containment isolation (trip) valves are actuated to the closed position either manually or by an automatically-derived safety injection signal. The automatic Phase B containment isolation valves are tripped closed by automatic or manual containment spray actuation. The actuation system is designed such that no single component failure will prevent containment isolation if required.

C. CONTAINMENT SYSTEMS

1. The containment vessel has an internal spray system which is capable of providing a distributed borated water spray of at least 2200 gpm. During the initial period of spray operation, sodium hydroxide would be added to the spray water to increase the removal of iodine from the containment atmosphere<sup>(3)</sup>.
  
2. The containment vessel has an internal air recirculation system which includes five fan-cooler units (centrifugal fans and water cooled heat exchangers), with a total heat removal capability of at least 308.5 MBtu/hr under conditions following a loss-of-coolant accident and at service water temperature of 95°F.<sup>(4)</sup> ~~All of the fan-cooler units are equipped with activated charcoal filters to remove volatile iodine following an accident.~~

References

- (1) UFSAR Section 5.1.2.2
- (2) UFSAR Section 5.1.4
- (3) UFSAR Section 6.3
- (4) UFSAR Section 6.4

**ATTACHMENT III  
SAFETY ASSESSMENT**

**CONSOLIDATED EDISON COMPANY OF NEW YORK, INC  
INDIAN POINT UNIT NO. 2  
DOCKET NO. 50-247  
NOVEMBER, 1999**

**Description of Proposed Changes:**

1) T.S. TABLE OF CONTENTS (Cont'd) page iv: Change the title of 4.5.D. to delete the words "Air Filtration".

This change is administrative in nature to reflect the revised function of the system to cooling of containment only, as a result of deletion of HEPA and charcoal filters. The deletion of the filters has been justified by re-analysis of design basis events using the NUREG-1465 alternate source term without filters. This analysis demonstrates that regulatory limits continue to be met.

2) T.S. 3.3.B.1.b. page 3.3-3: delete the words "charcoal filter".

This change reflects the deletion of the charcoal filters from the fan cooler units. The deletion of the filters has been justified by re-analysis of design basis events using the NUREG-1465 alternate source term without filters, which demonstrates that regulatory dose limits continue to be met.

3) T.S. 3.3 Basis page 3.3-13 first paragraph: delete the words "plus charcoal filters".

This basis change is being made to be consistent with the change 2) to the specification 3.3.B.1.b. for the fan cooler units.

4) T.S. 3.3 Basis page 3.3-15 fourth paragraph: delete the words "and/or for recirculation".

This change is being made to reflect proposed changes to the control room ventilation system that will be made prior to the effective date of the proposed technical specifications. The modifications proposed will utilize a "mode 2" design for filtered intake air rather than "mode 3" filtered recirculation for radiological design basis events.

5) T.S. 3.8.B.4. page 3.8-2: change "174 hours" to "100 hours".

This change is being made to be consistent with the re-analysis of the design basis fuel handling accident utilizing the NUREG-1465 alternate source term. 100 hours is used in that re-analysis for the minimum time for radioactive decay before moving fuel. Regulatory dose limits continue to be met.

6) T.S. 3.8.B.8. page 3.8-3: delete "and at least one personnel door in the equipment door or closure plate and in the personnel air lock".

This change is being made to be consistent with the re-analysis of the design basis fuel handling accident utilizing the NUREG-1465 alternate source term. No credit is taken in that re-analysis for containment isolation following the accident.

7) T.S. 3.8 Basis page 3.8-5 fourth paragraph: change "174 hours" to "100 hours", and change the last sentence to read "The analysis of the fuel handling accident inside and outside containment takes no credit for removal of radioactive iodine by charcoal filters."

This basis change is being made to be consistent with change 5) to the specification and the re-analysis of the design basis fuel handling accident utilizing the NUREG-1465 alternate source term.

8) T.S. 4.5.D. page 4.5-2 in the title: delete the words "AIR FILTRATION".

This change is administrative in nature to reflect the revised function of the system to cooling of containment only, as a result of deletion of HEPA and charcoal filters. The deletion of the filters has been justified by re-analysis of design basis events using the NUREG-1465 alternate source without filters, which demonstrates that regulatory limits continue to be met.

9) T.S. 4.5.D.1. page 4.5-2: change "per 31 days" to "monthly", and delete the words "HEPA filters and charcoal adsorbers".

This change is administrative in nature to be consistent with terminology defined in the specifications. Monthly and 31 days are here used synonymously. Deletion of testing requirements is consistent with the deletion of the filters themselves.

10) T.S. 4.5.D.2. page 4.5-2 and 4.5-3: change "65,600 cfm +/-10%" to "greater than or equal to 64,500 cfm.". Delete the remaining parts of 4.5.D.2 and 4.5.D.3 through 4.5.D.6.

This change is being made to specify flows consistent with the re-analysis of design basis accidents utilizing the NUREG-1465 alternate source term. The +/- 10% is no longer required, since a residence time for charcoal filters need not be specified after the filters are removed. The remaining parts of this specification relate to testing of filters, which are themselves being removed.

11) T.S. 4.5.E.1. page 4.5-4: change "per 31 days" to "monthly".

See 9) above. This change is administrative in nature, to be consistent with terminology defined in the specifications. Monthly and 31 days are here used synonymously.

12) T.S. 4.5.E.2.a. b. and c. page 4.5-4: change in each location "1840 cfm" to "2000 cfm".

This change is being made to be consistent with the current design of the control room filtration system and assumptions in the re-analysis of the design basis accidents utilizing the NUREG-1465 alternate source term.

13) T.S. 4.5.E.4.a. page 4.5-5: change "1840 cfm" to "2000 cfm".

See 12) above. This change is being made to be consistent with current design of the control room filtration system and assumptions in the re-analysis of the design basis accidents utilizing the NUREG-1465 alternate source term.

14) T.S. 4.5.E.4.b. page 4.5-5: change "recirculation" to "filtered-intake".

This change is being made to be consistent with current design of the control room filtration system and assumptions in the re-analysis of the design basis accidents utilizing the NUREG-1465 alternate source term.

15) T.S. 4.5.E.4.c. page 4.5-5: change "outside atmosphere" to "adjacent areas".

This change is being made to conform to regulatory guidance for acceptance criteria for testing control rooms.

16) T.S. 4.5.E.5, 6, and 6 page 4.5-5: change "1840 cfm" to "2000 cfm" in each location.

This change is being made to be consistent with current design of the control room filtration system and assumptions in the re-analysis of the design basis accidents utilizing the NUREG-1465 alternate source term.

17) T.S. 4.5 Basis page 4.5-10 fourth paragraph: delete the entire paragraph; and fifth paragraph: delete "and/or recirculation".

This change is being made to conform to proposed specification change 14).

18) T.S. 5.2.D.2. page 5.2-2: delete "All the fan cooler units are equipped with activated charcoal filters to remove volatile iodine following an accident".

This change reflects the deletion of the charcoal filters from the fan cooler units. The deletion of the filters has been justified by re-analysis of design basis events using the NUREG-1465 alternate source without filters, which demonstrates that regulatory dose limits continue to be met

#### Discussion:

Consolidated Edison Company received a Construction Permit (CPPR-21) and Operating License (DPR-26) for Indian Point Unit No. 2 from the Atomic Energy Commission on October 14, 1966 and October 19, 1971, respectively. The design of the facility included engineered safety features and Technical Specifications which were then believed to be necessary based upon the regulatory guidance on accident source terms originally published in 1962 in Technical Information Document

(TID) 14844, "Calculation of Distance Factors for Power and Test Reactors". The accident source term is used to characterize the postulated release of fission products from the reactor core into the containment during an accident.

Since the publication of TID-14844, significant advances have been made in understanding the timing, magnitude, and chemical form of fission product releases for severe nuclear power plant accidents. In 1995, the NRC published NUREG-1465, "Accident Source Terms for Light-Water Nuclear Power Plants", consolidating these significant advances. This document provided an updated, more physically based estimate of the source term appropriate for application to either the design of future power reactors or to currently licensed power reactors as an element of the facility design basis. For Design Basis Accident applications, the NUREG-1465 source term is comparable to the TID-14844 source term with regard to the magnitude of the noble gas and radioiodine release fraction. In addition, the NUREG-1465 revised accident source term is now recognized to provide a more representative description of the radionuclide composition and release timing.

There have also been significant developments in the principles and scientific knowledge underlying standards for systems of radiation dose limitation and assessment. These developments include not only updated scientific information on radionuclide uptake and metabolism, but also reflect changes in the basic philosophy of radiation protection. In 1991, the NRC revised 10 CFR 20, "Standards for Protection Against Radiation", to reflect these developments. The revisions to 10 CFR 20 provided for the use of Total Effective Dose Equivalent (TEDE) dose acceptance criteria. The TEDE dose acceptance criteria is a risk-consistent methodology that assesses the impact of all relevant radionuclides upon all body organs.

Consolidated Edison has performed a re-evaluation of design basis accidents utilizing the NUREG-1465 revised source term, and applying the TEDE dose acceptance criteria. This re-evaluation incorporated re-analysis of radiological doses at the site boundary, within the low population zone, and in the plant control room. These new analyses were performed taking no credit for reduction of radionuclides inside the containment building associated with the charcoal and HEPA filtration systems. In addition, the re-analysis of the fuel handling accident was performed taking no credit for filtration or containment isolation for a fuel handling accident inside containment, or for filtration for a fuel handling accident in the fuel storage building. The evaluation of the doses in the control room was based upon recently measured in-leakage using accurate tracer gas methodology, and planned modifications to utilize a filtered intake mode of HVAC operation for radiological protection of control room personnel. The results of the re-analysis have shown in all cases that radiological doses are within regulatory acceptance criteria using the TEDE methodology. Based upon these analyses utilizing NUREG-1465 and TEDE, the proposed technical specification changes would delete the requirements for containment filtration systems, delete the requirement for full containment integrity during fuel handling shutdown operations, and conform the technical specifications to other analysis assumptions.

### **Basis for No Significant Hazards Consideration Determination**

The proposed changes do not involve a significant hazards consideration because:

- 1. There is no significant increase in the probability or consequences of an accident previously evaluated.**

These changes do not affect possible initiating events for accidents previously evaluated. Limiting Safety System Settings and Safety Limits specified in the current Technical Specifications remain unchanged. Therefore, the proposed changes to the subject Technical Specifications would not increase the probability of an accident previously evaluated. The re-analysis of design basis accidents described above demonstrate that compliance with regulatory dose acceptance criteria continue to be met. Therefore, the proposed changes to the subject Technical Specifications would not significantly increase the consequences of an accident previously evaluated.

- 2. The possibility of a new or different kind of accident from any accident previously evaluated has not been created.**

The proposed physical changes to the facility have been evaluated, and the plant conditions for which the design basis accidents have been evaluated are still valid. The operating procedures and emergency procedures will be changed to reflect these changes. Consequently, no new failure modes are introduced as a result of the proposed changes. Therefore, the proposed changes will not initiate any new or different kind of accident.

- 3. There has been no significant reduction in the margin of safety.**

The revised Indian Point Unit 2 design basis accident offsite and control room dose calculations, performed with the improved knowledge base and with the modeling of proposed plant changes, remain within regulatory acceptance criteria (10 CFR 100 and 10 CFR 50 Appendix A General Design Criterion 19, respectively) utilizing the TEDE dose acceptance criteria directed by the Commission for use in SECY-96-242. An acceptable margin of safety is inherent in these licensing acceptance limits. Therefore, there is no significant reduction in the margin of safety.

The proposed changes have been reviewed by both the Station Nuclear Safety Committee (SNSC) and the Con Edison Nuclear Facility Safety Committee (NFSC). Both Committees concur that the proposed changes do not represent a significant hazards consideration.