ATTACHMENT I

PROPOSED TECHNICAL SPECIFICATIONS CHANGES

NEW YORK POWER AUTHORITY
INDIAN POINT 3 NUCLEAR POWER PLANT
DOCKET NO. 50-286

## 3.8 Refueling, Fuel Handling and Storage

### Applicability

Applies to operating limitations during refueling, fuel handling, storage operations, and when heavy loads are moved over the reactor when the head is removed.

### Objective

To ensure that no incident could occur during refueling, fuel handling, and storage operations that would adversely affect public health and safety.

### Specification

A. During handling operations, reactor vessel head removal or installation, or movement of heavy loads over the reactor vessel with the head removed, the following conditions shall be met:

1. The equipment door and at least one door in each personnel air lock shall be properly closed. When the closure plate with a personnel door that prevents direct air flow from the containment is used, it shall be properly closed.

2. At least one isolation valve shall be operable, locked closed or blind flanged in each line penetrating the containment and which provides a direct path from containment atmosphere to the outside.

3. Radiation levels in the containment and spent fuel storage areas shall be monitored continously.

4. The core subcritical neutron flux shall be continuously monitored by the two source range neutron monitors, each with continous visual indication in the control room and one with audible indication in the containment available whenever core geometry is being changed. When core geometry is not being changed, at least one source range neutron flux monitor shall be in service.

5. At least one residual heat removal pump and heat exchanger shall be operating except during those core alternations in which the residual heat removal flow interferes with component positioning.

6. During reactor vessel head removal and while loading and unloading fuel in the reactor, $T_{avg}$ shall be $< 140^{o}F$ and the minimum boron concentration sufficient to maintain the reactor subcritical by at least 10% $\Delta k/k$. The required boron concentration shall be verified by chemical analysis daily.

7. Direct communication between the control room and the refueling cavity manipulator crane shall be available whenever changes in core geometry are taking place.

8. The containment vent and purge system, including the radiation monitors which initiate isolation, shall be tested and verified to be operable within 100 hours prior to refueling operations.

9. No movement of irradiated fuel in the reactor shall be made until the reactor has been subcritical for at least 120 hours. In addition, movement of fuel in the reactor before the reactor has been subcritical for equal to or greater than 365 hours will necessitate operation of the Containment Building Vent and Purge System through the HEPA filters and charcoal adsorbers. For this case operability of the Containment Building Vent and Purge System shall be established in accordance with Section 4.13 of the Technical Specifications. In the event that more than one region of fuel (72 assemblies) is to be discharged from the reactor, those assemblies in excess of one region shall not be discharged before the interval of 400 hours has elapsed after shutdown.

10. Whenever movement of irradiated fuel is being made, the minimum water level in the area of movement shall be maintained 23 feet over the top of the reactor pressure vessel flange.

11. Hoists or cranes utilized in handling irradiated fuel shall be dead-load tested before movement begins. The load assumed by the hoists or cranes for this test must be equal to or greater than the maximum load to be assumed by the hoists or cranes during the refueling operation. A thorough visual inspection of the hoists or cranes shall be made after the dead-load test and prior to fuel handling. A test of interlocks and overload cutoff devices on the manipulator shall also be performed.

12. The fuel storage building emergency ventilation system shall be operable whenever irradiated fuel is being handled within the fuel storage building. The emergency ventilation system may be inoperable when irradiated fuel is in the fuel storage building, provided irradiated fuel is not being handled and neither the spent fuel cask nor the cask crane are moved over the spent fuel pit during the period of inoperability.

13. To ensure redundant decay heat removal capability, at least two of the following requirements shall be met:

a. No. 31 residual heat removal pump and heat exchanger, together with their associated piping and valves are operable.

b. No. 32 residual heat removal pump and heat exchanger, together with their associated piping and valves are operable.

c. The water level in the refueling cavity above the top of the reactor vessel flange is equal to or greater than 23 feet.

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

C. During fuel handling and storage operations, the following conditions shall be met:

1. Radiation levels in the spent fuel storage area shall be monitored continuously whenever there is irradiated fuel stored therein. If the monitor is inoperable, a portable monitor may be used.

2. The spent fuel cask shall not be moved over any region of the spent fuel pit which contains irradiated fuel. Additionally, if the spent fuel pit contains irradiated fuel, no loads in excess of 2,000 pounds shall be moved over any region of the spent fuel pit.

3. During periods of spent fuel cask or fuel storage building cask crane movement over the spent fuel pit, or during periods of spent fuel movement in the spent fuel pit when the pit contains irradiated fuel, the pit shall be filled with borated water at a concentration of $>1000$ ppm.

4. Whenever movement of irradiated fuel in the spent fuel pit is being made, the minimum water level in the area of movement shall be maintained 23 feet over the top of irradiated fuel assemblies seated in the storage rack.

5. Hoists or cranes utilized in handling irradiated fuel shall be deadload tested before fuel movement begins. The load assumed by the hoists or cranes for this test must be equal to or greater than the maximum load to be assumed by the hoists or cranes during the fuel handling operation. A thorough visual inspection of the hoists or cranes shall be made after the deadload test prior to fuel handling.

6. The fuel storage building emergency ventilation system shall be operable whenever irradiated fuel is being handled within the fuel storage building. The emergency ventilation system may be inoperable when irradiated fuel is in the fuel storage building, provided irradiated fuel is not being handled and neither the spent fuel cask nor the cask crane are moved over the spent fuel pit during the periods of inoperability.

## Basis

The equipment and general procedures to be utilized during refueling, fuel handling, and storage 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, fuel handling, reactor maintenance or storage operations that would result in a hazard to public health and safety.[1] Whenever changes are not being made in core geometry, one flux monitor is sufficient. This permits maintenance of the instrumentation. Continuous monitoring of radiation levels 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 indicated will keep the core subcritical, even if all control rods were withdrawn from the core. During refueling the reactor refueling cavity is filled with approximately 342,000 gallons of water from the refueling water storage tank with a boron concentration of 2000 ppm. A shutdown margin of 10% $\Delta K/K$ in the cold condition with all rods inserted will also maintain the core subcritical even if no control rods were inserted into the reactor.[2] Periodic checks of refueling water boron concentration and residual heat removal pump operation insure the proper shutdown margin. The requirement for direct communications allows 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 120-hour decay time following the subcritical condition and the 23 feet of water above the top of the reactor pressure vessel flange is consistent with the assumptions used in the dose calculation for the fuel-handling accident.

The waiting time of 400 hours required following plant shutdown before unloading more than one region of fuel from the reactor assures that the maximum pool water temperature will be within design objectives as stated in the FSAR.

The requirement for the fuel storage building emergency ventilation system to be operable is established in accordance with standard testing requirements to assure that the system will function to reduce the offsite dose to within acceptable limits in the event of a fuel-handling accident. The system is actuated upon receipt of a signal from the area high activity alarm or by a manually-operated switch. The system is tested prior to fuel handling and is in a standby basis.

When fuel in the reactor is moved before the reactor has been subcritical for at least 365 hours, the limitations on the containment vent and purge system ensure that all radioactive material released from an irradiated fuel assembly will be filtered through the HEPA filters and charcoal adsorbers prior to discharge to the atmosphere.

The limit to have at least two means of decay heat removal operable ensures that a single failure of the operating RHR System will not result in a total loss of decay heat removal capability. With the reactor head removed and 23 feet of water above the vessel flange, a large heat sink is available for core cooling. Thus, in the event of a single component failure, adequate time is provided to initiate diverse methods to cool the core.

The minimum spent fuel pit boron concentration and the 90-day restriction of the movement of the spent fuel cask to allow the irradiated fuel to decay were specified in order to minimize the consequences of an unlikely sideways cask drop.

When the spent fuel cask is being placed in or removed from its position in the spent fuel pit, mechanical stops incorporated in the bridge rails make it impossible for the bridge of the crane to travel further north than a point directly over the spot reserved for the cask in the pit. Thus, it will be possible to handle the spent fuel cask with the 40-ton hook and to move new fuel to the new fuel elevator with a 5-ton hook, but it will be impossible to carry any object over the spent fuel storage area with either the 40 or 5-ton hook of the fuel storage building crane.

Deadload test and visual inspection of the hoists and cranes before handling irradiated fuel provide assurance that the hoists or cranes are capable of proper operation.

References

(1) FSAR - Section 9.5.2
(2) FSAR - Table 3.2.1-1

ATTACHMENT II
SAFETY EVALUATION OF PROPOSED
TECHNICAL SPECIFICATIONS

NEW YORK POWER AUTHORITY
INDIAN POINT 3 NUCLEAR POWER PLANT
DOCKET NO. 50-286

I. Description of Change

The proposed revision to the Indian Point 3 Technical Specifications provides for the utilization of a temporary closure plate in place of the equipment door during refueling operations. Also included are editorial changes to Section 3.8.

II. Evaluation of Change

The current Indian Point 3 Technical Specifications require that the equipment door and at least one door in each personnel air lock shall be properly closed during refueling operations. This requirement has been imposed to ensure a barrier that will restrict direct release from the containment in the event of a postulated accident.

During refueling operations the reactor is cooled below 140$^{o}$F, is depressurized and open to containment. The IP-3 Technical Specifications require that whenever movement of irradiated fuel is made, the minimum water level in the area of movement shall be maintained 23 feet over the top of the reactor pressure vessel flange. Also to ensure redundant decay heat removal capability, at least two of the following requirements must be met:

a) No. 31 residual heat removal pump and heat exchanger, together with their associated piping and valves is operable.

b) No. 32 residual heat removal pump and heat exchanger, together with their associated piping and valves is operable.

c) The water level in the refueling cavity above the top of the reactor vessel flange is equal to or greater than 23 feet.

The Authority considers a postulated fuel handling accident the most limiting accident with regard to the installation of a temporary closure plate.

The Fuel Handling System is designed to minimize the possibility of mishandling or maloperations that cause fuel damage and potential fission product release. The reactor is refueled with equipment designed to handle the spent fuel underwater from the time it leaves the reactor vessel until it is placed in a cask for shipment from the site. Boric acid is added to the water to ensure subcritical conditions during refueling. Therefore, if a fuel handling accident inside containment does occur, the impact and damage of the fuel assembly takes place underwater. Under these conditions there is no potential for a rapid release of energy to the containment which might cause an increase in pressure. The evaluation of a postulated fuel handling accident is discussed in detail in Section 14.2 of IP-3's FSAR.

The closure plate that would be installed, will be designed to a pressure which ensures containment integrity during refueling operations. This temporary closure plate will provide the same level of protection as that of the equipment door for the fuel handling accident by restricting direct leakage from the containment to the environment.

## III. No Significant Hazards Evaluation

1) Does the proposed license amendment involve a significant increase in the probability or consequences of an accident previously evaluated?

The proposed change does not increase the probability or consequences of an accident previously evaluated. Since redundant decay heat removal capability is provided, and a postulated fuel handling accident will occur underwater, there is no potential for a rapid release of energy to the containment.

2) Does the proposed license amendment create the possibility of a new or different kind of accident from any accident previously evaluated?

The proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated. The temporary closure plate will be seismically designed to ensure no breach of containment as a result of a seismic event. This plate will provide the same level of protection as that of the equipment door by restricting containment leakage to the environment.

3) Does the proposed amendment involve a significant reduction in a margin of safety?

The proposed change of installing a closure plate during refueling operations in place of the equipment door does not involve a significant reduction in a margin of safety. The plate will be seismically installed and designed to a pressure which ensures containment integrity during refueling operations.

The Authority considers that the proposed change can be classified as not likely to involve significant hazard considerations since the proposed change constitutes "a change which may reduce in some way a safety margin, but where the results of the change are clearly within all acceptable criteria with respect to the system or component specified in the Standard Review Plan." (Example, (vi), Federal Register, Vol. 48 No. 67 dated April 6, 1983, page 148701).

## IV. Impact of Change

This change will not adversely impact the following:

- ALARA Program
- Security and Fire Protection Programs
- Emergency Plan
- FSAR or SER Conclusions
- Overall Plant Operations and the Environment

## V. Conclusion

This change: a) will not increase the probability nor the consequences of an accident or malfunction of equipment important to safety as previously evaluated in the Safety Analysis Report; b) will not increase the possibility for an accident or malfunction of a different type than evaluated previously in the Safety Analysis Report; c) will not reduce the margin of safety as defined in the basis for any Technical Specification; d) does not constitute an unreviewed safety question as defined in 10 CFR 50.59; e) involves no significant hazards considerations as defined in 10 CFR 50.92.

## VI. References

a) IP-3 FSAR
b) IP-3 SER