ATTACHMENT I TO IPN-97-175

CHANGES TO THE TECHNICAL SPECIFICATION BASES

NEW YORK POWER AUTHORITY
INDIAN POINT 3 NUCLEAR POWER PLANT
DOCKET NO. 50-286
DPR-64

cold shutdown condition, utilizing normal shutdown and cooldown procedures. In the cold shutdown condition there is no possibility of an accident that would damage the fuel elements or result in a release in excess of 10 CFR 100 and 10 CFR 50 dose limits.

The plant operating procedures require immediate action to effect repairs of an inoperable component, and, therefore, in most cases repairs will be completed in less than the specified allowable repair times. The limiting times to repair are based on two considerations:

1) Assuring with high reliability that the safeguard system will function properly if required to do so.

2) Allowances of sufficient time to effect repairs using safe and proper procedures.

Assuming the reactor has been operating at full rated power, the magnitude of the decay heat decreases after initiating hot shutdown. Thus, the requirement for core cooling in case of a postulated loss-of-coolant accident while in the hot shutdown condition is significantly reduced below the requirements for a postulated loss-of-coolant accident during power operation. Putting the reactor in the hot shutdown condition significantly reduces the potential consequences of a loss-of-coolant accident, and also allows more free access to some of the engineered safeguards components in order to effect repairs.

Failure to complete repairs within 1 hour of going to the hot shutdown condition is considered indicative of a requirement for major maintenance and, therefore, in such a case the reactor is to be put into the cold shutdown condition.

The limits for the Refueling Water Storage Tank and the accumulators insure the required amount of water with the proper boron concentration for injection into the reactor coolant system following a loss-of-coolant accident is available. These limits are based on values used in the accident analysis.[9][13]

A total of six service water pumps are installed. Only two of the set of three service water pumps on the header designated the essential header are required immediately following a postulated loss-of-coolant accident.[8] During the recirculation phase of the accident, two service water pumps on the non-essential header will be manually started to supply cooling water for one component cooling system heat exchanger, one control room air conditioner, and one diesel generator; the other component cooling system heat exchanger, the other control room air conditioner, the two other diesel generators and remaining safety related equipment are cooled by the essential service water header.[14] During the recirculation phase of the accident, both control room air conditioner units may be cooled by the essential service water header.

The operability requirements on service water temperature monitoring instrumentation and the frequency of service water temperature monitoring insures that appropriate action can be taken to preclude operation beyond established limits. The locations selected for monitoring river water temperature are typically at the circulating or service water inlets, at the circulating water inlet boxes to the condenser hotwells or at the service water supply header to the fan cooler units. Temperature measurements at each of these locations are representative of the river water temperature supplied to cool plant heat loads. Alternate locations may be acceptable on this basis. The limit on the service water maximum inlet temperature insures that the service water and component cooling water systems will be able to dissipate the heat loads generated in the limiting design basis accident[15]. This restriction allows up to seven hours for river water temperature transients which may temporarily increase the service water inlet temperature due to tidal effects to dissipate.

The operability of the equipment and systems required for the control of hydrogen gas ensures that this equipment is available to maintain the hydrogen concentration within containment below the flammable limit during post-LOCA conditions. Hydrogen concentration exceeding the flammable limit could potentially result in a containment wide hydrogen burn. This could lead to overpressurization of containment, a breach of CONTAINMENT INTEGRITY, containment leakage, unacceptably high offsite doses, and damage to safety-related equipment located in containment. Two full rated recombiner units are provided in order to control the hydrogen evolved in containment following a loss-of-coolant accident. Each unit is capable of preventing the hydrogen concentration from exceeding the flammable limit. Each recombiner is installed such that independence is maintained and redundancy is assured. Each hydrogen recombiner system consists of a recombiner located inside containment, and a separate power supply, and control panel located outside containment such that they are accessible following a design basis accident.

C. Containment Temperature

1. The reactor shall not be taken above the cold shutdown condition unless the containment ambient temperature is greater than 50°F.

2. Containment ambient temperature shall not exceed 130°F when the reactor is above the cold shutdown condition. If the temperature is greater than 130°F, reduce the temperature to within the limit within 8 hours, or be in hot shutdown within the next 6 hours and in cold shutdown within the following 30 hours.

3. Containment ambient temperature as specified in 3.6.C.1 and 3.6.C.2 shall be the arithmetic average of temperatures measured at no fewer than 4 locations, at least once per 24 hours.

D. Containment Vent and Purge System

The reactor shall not be taken above the cold shutdown condition unless the containment vent isolation valves (PCV - 1190, - 1191, - 1192) are closed or limited to a maximum valve opening angle of 60° (90° - full open) by mechanical means.

The reactor shall not be taken above the cold shutdown condition unless the containment purge supply and exhaust isolation valves (FCV - 1170, - 1171, - 1172, - 1173) are closed.

If the above conditions cannot be met within one hour, the reactor shall be in the hot shutdown condition within six hours and in the cold shutdown condition within the next 30 hours.

Basis

The Reactor Coolant System must be in the cold shutdown condition in order to relax containment integrity. When the Reactor Coolant System is in the cold shutdown condition, the pressurizer may have an internal temperature above 200°F for purposes of drawing and maintaining a steam bubble, provided that the reactor has been subcritical for at least 24 hours. Operation in this manner ensures that, in case of an accidental RCS coolant release under cold shutdown conditions, the ensuing offsite radiation doses will be within the limits of 10 CFR 100.

The shutdown margins are selected on the type of activities that are being carried out. The shutdown margin requirement of specification 3.8.D when the vessel head bolts are less than fully tensioned precludes criticality during refueling. When the reactor head is not to be removed, the specified cold shutdown margin of 1% Δ k/k precludes criticality in any occurrence.

One battery charger shall be in service on each battery so that the batteries will always be at full charge in anticipation of a loss-of-AC power incident. This insures that adequate D.C. power will be available for starting the emergency generators and other emergency uses.

The plant can be safely shutdown without the use of offsite power since all vital loads (safety systems, instruments, etc.) can be supplied from the emergency diesel generators.

Any two of three diesel generators, the station auxiliary transformer or the separate 13.8 to 6.9 KV transformer are each capable of supplying the minimum safeguards loads, and therefore provide separate sources of power immediately available for operation of these loads. Thus the power supply system meets the single failure criteria required of safety systems. To provide maximum assurance that the redundant or alternate power supplies will operate if required to do so, the redundant or alternate power supplies are verified operable prior to initiating repair of the inoperable power supply. Continued plant operation is governed by the specified allowable time period for the power source, not the specified allowable time period for those items determined to be inoperable solely because of the inoperability of its normal or emergency power source provided the conditions defined in specification 3.7.G are satisfied. These conditions assure that the minimum required safeguards will be operable. If it develops that (a) the inoperable power supply is not repaired within the specified allowable time period, or (b) a second power supply in the same or related category is found to be inoperable, the reactor, if critical, will initially be brought to the hot shutdown condition utilizing normal operating procedures to provide for reduction of the decay heat from the fuel, and consequent reduction of cooling requirements after a postulated loss-of-coolant accident. If the reactor was already subcritical, the reactor coolant system temperature and pressure will be maintained within the stated values in order to limit the amount of stored energy in the Reactor Coolant System. The stated tolerances provide a band for operator control. After a limited time in hot shutdown, if the malfunction(s) are not corrected, the reactor will be brought to the cold shutdown condition, utilizing normal shutdown and cool-down procedures. In the cold shutdown condition there is no possibility of an accident that would damage the fuel elements or result in a release in excess of 10 CFR 100 and 10 CFR 50 dose limits.

Conditions of a system-wide blackout could result in a unit trip. Since normal off-site power supplies as required in Specification 3.7.A.1 are not available for startup, it is necessary to be able to black start the unit with gas turbines providing the incoming power supplies as a first step in restoring the system to an operable status and restoring power to customers for essential services. Specification 3.7.C provides for startup using 37 MW's of gas turbine power (nameplate rating at 80°F) which is sufficient to carry out a normal plant startup. A system-wide blackout is deemed to exist when the majority of Con Edison electric generating facilities are shutdown due to an electrical disturbance and the remainder are incapable of supplying the system therefore necessitating major load shedding.

ATTACHMENT II TO IPN-97-175

JUSTIFICATION FOR CHANGES TO

TECHNICAL SPECIFICATION BASES

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JUSTIFICATION FOR CHANGES TO THE TECHNICAL SPECIFICATION BASES

1. Elimination of Transfer of Control Room Air Conditioning Unit to the Non-Essential Service Water Header During Post-LOCA Recirculation

The Technical Specification Basis on page 3.3-19 has been revised to allow maintaining cooling water to both control room air conditioner (CRAC) units from the essential SW header during the post-LOCA recirculation phase if desired, instead of transferring one CRAC unit to the non-essential service water (SW) header during recirculation.

The Nuclear Safety Evaluation (NSE) 96-3-219 SWS to evaluate this change has demonstrated that maintaining both CRAC units aligned to the essential SW header during recirculation is an acceptable change to the TS Bases and does not represent an unreviewed safety question.

The original SW pipe break analysis demonstrated that the SW system could satisfy post-LOCA recirculation phase flow requirements under several postulated pipe break conditions. The results of this analysis indicated that adequate cooling to the diesel generators was available provided that system alignment changes were made. The system alignment changes were incorporated into the emergency plant procedures to split the component cooling water heat exchangers, CRAC units and the emergency diesel generator coolers between the essential and the non-essential SW headers during the recirculation phase. This realignment ensured that postulated failures in the system did not result in an unsafe condition due to inadequate cooling to safety related components.

As part of an effort to demonstrate the adequacy of replacement SW pumps, the SW hydraulic analysis was reviewed and updated and the overly conservative pipe break criteria of guillotine ruptures and slot breaks was replaced with pipe rupture criteria for a moderate energy fluid system. A review of the existing SW Hydraulic Evaluation has determined that alignment of both 31 and 32 CRAC units to the essential SW header will not adversely impact SW flow to equipment or pump performance. The total additional essential header flow, based on 95°F SW temperature, will be 78 gpm. The additional flow rate of 78 gpm represents an inconsequential flow increase of less than 1/2% of the worst case post-LOCA recirculation flow requirements. The change to the TS bases does not affect the ability of the SW system to meet the single failure criteria and does not involve either a change to the Technical Specifications themselves, or a change to the FSAR or TS Bases that involves an unreviewed safety question as defined in 10 CFR 50.59.

2. <u>Operation with a Steam Bubble in the Pressurizer and the RCS in Cold Shutdown Condition</u>

The IP3 Technical Specification (TS) Basis on page 3.6-2 has been revised to indicate that when the Reactor Coolant System (RCS) is in the cold shutdown condition, the pressurizer may have an internal temperature above 200°F for the purposes of drawing and maintaining a steam bubble, provided that the reactor has been subcritical for at least 24 hours. TS Bases on pages 3.3-15 and 3.7-5 have also been revised to be consistent with the reivsed basis on page 3.6-2.

Operation in this manner ensures that, in case of an accidental RCS coolant release under cold shutdown conditions, the ensuing radiation doses will be within the limits of 10 CFR 100 and GDC 19 of 10 CFR 50, Appendix A. A 50.59 Nuclear Safety Evaluation (NSE) 95-3-044-PZR, Rev. 3 has demonstrated that operation under these conditions is consistent with the existing analyses documented in the FSAR and that, for the purpose of accident evaluation, is bounded by the "Small Break LOCA During Purge" scenario in FSAR Section 14.3.5. The IP3 TS require the establishment of containment integrity prior to bringing the plant above cold shutdown. This is to ensure that, should there be a break in the RCS piping, there will be adequate protection against any activity carried by the spilled reactor coolant, thereby minimizing the dose rate in the control room and at the site boundary. A typical plant startup includes starting a single Reactor Coolant Pump (RCP) when the RCS is pressurized to above 325 psig, with T_{avg} below 200°F and the system solid. If the RCP is to be used to heat the RCS above cold shutdown, containment integrity is established prior to pump start. Once pump heat brings T_{avg} above 200°F, then a steam bubble is drawn in the pressurizer, and the heatup process continues. This process includes the potential of a pressure spike in the RCS resulting from pump start. If there were a steam bubble in the pressurizer, the pressure spike resulting from subsequent pump starts would be almost completely absorbed by the gas cushion, with little or no observable effect on RCS pressure.

Similarly, during the cooldown process and beyond, it may be desirable to maintain a pressurizer bubble with the RCS T_{avg} below 200°F, particularly for outages not requiring RCS depressurization. This is essentially the same situation as the heat up case, in that the RCS is below 200°F with a bubble in the pressurizer and containment integrity relaxed. The change to the Technical Specification Bases does not involve either a change to the Technical Specifications themselves, or a change to the FSAR or TS Bases that involves an unreviewed safety question as defined in 10 CFR 50.59.