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February 27, 2001

Re: Indian Point Unit No. 2
Docket No. 50-247
NL 01-020

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Mail Stop P1-137
Washington, D.C. 20555-0001

SUBJECT: Indian Point 2 License Amendment Request - Revision of Technical Specification Applicability for Engineered Safety Systems

Transmitted herewith is an Application for Amendment to the Operating License. The application requests an amendment to the Consolidated Edison Company of New York, Inc. (Con Edison), Indian Point Unit No. 2 (IP2) Technical Specifications (TS). These changes consist of revision of the applicability of the requirements for certain engineered safety systems and the auxiliary electrical system from "critical" to "average reactor coolant temperature above 350°F." The proposed changes affect TSs 3.3, "Engineered Safety Features," and 3.7, "Auxiliary Electrical Systems." These changes are necessary to reflect the analyses associated with a postulated steam line break and are consistent with the applicability requirements for emergency core cooling systems in the Standard Technical Specifications (NUREG 1431). The details of the proposed changes are provided in the attachments to this letter.

Attachment 1 to this letter provides the description and evaluation of the proposed changes. The revised TS pages are provided in Attachment 2 (strikeout/shadow format).

The proposed TS changes provide requirements that are more conservative than the current TSs, in that the affected systems will be required to be operable at a lower average reactor coolant temperature. These proposed requirements are currently incorporated into plant procedures. Con Edison requests a timely review and that the proposed changes be approved by September 2001 with an effective date within 60 days of approval.

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The Station Nuclear Safety Committee (SNSC) and the Nuclear Facility Safety Committee (NFSC) have reviewed the proposed changes. Both committees concur that the proposed changes do not represent a significant hazards consideration as defined by 10 CFR 50.92 (c).

In accordance with 10 CFR 50.91, a copy of this submittal and the associated attachments is being submitted to the designated New York State official.

There are no commitments contained in this submittal. Should you or your staff have any questions regarding this submittal, please contact Mr. John F. McCann, Manager, Nuclear Safety and Licensing at (914) 734-5074.

Very truly yours,

A. Alan Blind

Attachments

cc:

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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 this license.

The specific proposed Technical Specification revisions are set forth in the attachments. The associated assessments demonstrate 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: A. Alan Blind
Alan Blind
Vice President - Nuclear Power

Subscribed and sworn to
before me this 27 day
February, 2001.

Ersilia A. Amanna (Borriero)
Notary Public

ERSILIA A. AMANNA
Notary Public, State of New York
No. 01AM6038889
Qualified in Westchester County
Commission Expires March 20, 2002

ATTACHMENT 1 TO NL 01-020

LICENSE AMENDMENT REQUEST

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

LICENSE AMENDMENT REQUEST

DESCRIPTION OF THE PROPOSED CHANGE

Consolidated Edison Company of New York, Inc. (Con Edison) is requesting a change to the Indian Point Unit No. 2 (IP2) Technical Specifications (TS) to revise the applicability of TSs associated with engineered safety features (ESF) and corresponding auxiliary electrical systems. This change revises the plant condition under which the TS requirements are applicable for certain ESF systems from "critical" to "average reactor coolant temperature above 350°F." Consistent with this change, the associated action that is required to be taken when the TS requirement cannot be met is being changed to cool down below 350°F (i.e., exit the applicable plant condition). Additionally, the associated TS statements that incorrectly refer to "power operation" and "normal reactor operation" for these TSs are being corrected. Corresponding changes are also being proposed to the Bases. Minor formatting changes on the affected TS pages that do not affect any text in the current TS occur on some pages and are not marked with revision bars.

These changes are necessary to reflect the requirement for safety injection (SI) equipment during hot shutdown conditions included in the steam line break analyses. The proposed changes result in requirements that are more conservative than the current TSs, in that the affected systems will be required to be operable at a lower average reactor coolant temperature. Additionally, these changes are consistent with the Standard Technical Specifications (STS) presented in NUREG-1431, "Standard Technical Specifications, Westinghouse Plants." STS 3.5.2 requires that emergency core cooling systems (ECCS) be operable in Modes 1, 2, and 3. Since IP2 does not use Modes as defined by STS, the proposed changes utilize an applicable condition of average reactor coolant temperature above 350°F which is equivalent to the STS definition for Mode 3.

The following table indicates the TS/systems that are affected by the proposed changes.

TS Section	TS Number	Change Type*
Safety Injection and Residual Heat Removal Systems	3.3.A.1	A
	3.3.A.2	B, C
Containment Cooling and Iodine Removal Systems	3.3.B.1	A
	3.3.B.2	B, C
Component Cooling System	3.3.E.1	A
	3.3.E.2	B, C

TS Section	TS Number	Change Type*
Cable Tunnel Ventilation Fans	3.3.I.1	A
	3.3.I.2	C
Engineered Safety Features	BASES 3.3	D
Auxiliary Electrical Systems	3.7.A	A
	3.7.B	C

* Change Type corresponds to the following proposed changes:

A. Change applicable condition from "critical" to "average reactor coolant temperature heated above 350°F"
B. Change required action from "place in the cold shutdown condition" to "average reactor coolant temperature shall be cooled below 350°F"
C. Remove references to "power operation" or "normal reactor operation"
D. Supporting revisions to Bases

EVALUATION OF THE PROPOSED CHANGE

In 1982 (Reference 1), IP2 notified the NRC of results of a review of the steam line break accident analyses for IP2. The steam line break accident analyses for IP2 are presented in Section 14.2.5 of the Updated Final Safety Analysis Report (UFSAR). Cases analyzed assume that the unit is initially at hot shutdown conditions since these conditions result in the most conservative assessment of effects on the reactor core and coolant systems. As part of the analyses, certain minimum engineered safeguards equipment is assumed to operate to mitigate and terminate the transient.

At the time of discovery of that event, plant operating procedures required that the necessary safeguards equipment be operable prior to bringing the reactor critical but did not establish specific operability requirements for this equipment when average reactor coolant temperature exceeded 350°F and the reactor was not critical. Thus, to provide clear direction for the plant operators, operating procedures were revised to require the operability of safeguards equipment necessary to mitigate a steam line break transient prior to heating the average reactor coolant above 350°F from the cold shutdown condition. These requirements are still controlled by plant operating procedures. The proposed changes update the affected TSs to reflect the same requirements.

The TSs associated with these requirement are TS 3.3.A, "Safety Injection and Residual Heat Removal Systems," TS 3.3.B, "Containment Cooling and Iodine Removal Systems," TS 3.3.E, "Component Cooling System," TS 3.3.I, "Cable Tunnel Ventilation Fans," and TS 3.7, "Auxiliary Electrical Systems." These TSs currently require that the specified system be operable prior to taking the reactor critical. The proposed changes will revise these TSs to reflect the requirement of the steam line break analyses that these systems be operable with average reactor coolant temperature above 350°F.

Where applicable, the required actions for equipment inoperability that are associated with these TSs are also being changed to require exiting the revised applicable condition (average reactor coolant temperature above 350°F) rather than proceeding to the cold shutdown condition. Additionally, certain statements in the affected TSs incorrectly refer to "power operation" and "normal reactor operation" conditions. These references are being corrected. The Bases for Section 3.3 are also being updated consistent with the proposed TS changes.

TS 3.3.F, "Service Water System," was previously changed to reflect the requirement to be operable above 350°F as part of Amendment No. 139 (Reference 2). Changes to the required actions of TS 3.3.F were completed as part of Amendment No. 149 (Reference 3).

The proposed changes result in more restrictive requirements for the affected systems by requiring that the safeguards systems and associated auxiliary electrical systems be operable when average reactor coolant temperature is above 350°F and the reactor is not critical. (The minimum temperature for criticality is greater than 350°F.) The proposed applicability for the safeguards systems reflects the requirements of the steam line break analyses for IP2 as presented in the UFSAR. Additionally, the proposed requirements are consistent with STS Section 3.5.2, "ECCS Operating," which requires ECCS to be operable in Modes 1, 2, and 3 (Mode 3 corresponds to a average reactor coolant temperature greater than 350°F).

NO SIGNIFICANT HAZARDS CONSIDERATION

The proposed changes described above do not involve a significant hazards consideration. This conclusion is based on the evaluation, in accordance with 10 CFR 50.91(a)(1), of the three standards set forth in 10 CFR 50.92(c).

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

   The proposed changes consist of revisions to the TS requirements for certain safeguards equipment and associated auxiliary electrical equipment to reflect the requirements of the steam line break analyses. The result of these changes will be that these safeguards systems will be required to be operable for additional plant conditions (with average reactor coolant temperature above 350°F and the reactor not critical). These operability requirements for the safeguards equipment meet the assumptions utilized in the IP2 safety analyses and, therefore, will not result in a change in the consequences of the accident analyses.

   Additionally, the affected safeguards equipment is not an initiator for any accident previously analyzed for IP2. The proposed changes do not result in a change to the design or operation of the safeguards equipment but extends the plant conditions under which this equipment will be required to be operable.

   Therefore, there is no increase in the probability or in the consequences of an accident previously evaluated.

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

   The proposed changes involve revising the TS applicability for certain safeguards equipment and associated auxiliary electrical systems to require this equipment to be operable with average reactor coolant temperature above 350°F. The proposed changes do not involve a change to the design or operation of any plant system or equipment. The result of the proposed change is an increased range of operating conditions under which the safeguards equipment will be required to be operable. Therefore, the proposed changes do not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

   The proposed changes reflect the assumptions for safeguards equipment operability assumed in the steam line break accident analyses. These changes ensure that the affected TS reflect the assumptions of the safety analyses but do not result in a change to any of the safety analyses or any margin of safety.

CONCLUSION

The proposed changes involve revisions to the TSs to reflect the assumptions for safeguards systems operability in the analyses for a steam line break. These changes result in more restrictive requirements for the affected equipment. Additionally, these changes are consistent with the STS requirements for ECCS. These changes do not involve physical changes to the plant, changes to the operation of plant systems, or changes to the plant safety analyses. Accordingly, the more restrictive requirements do not involve a significant hazards consideration.

REFERENCES

1. Con Edison letter to NRC dated March 24, 1982, LER 82-010

2. NRC letter to Con Edison dated May 8, 1989, "Issuance of Amendment (TAC No. 71777)," Amendment No. 139

3. NRC letter to Con Edison dated March 27, 1990, "Issuance of Amendment (TAC No. 73764)," Amendment No. 149

ATTACHMENT 2 TO NL 01-020

LICENSE AMENDMENT REQUEST

TECHNICAL SPECIFICATION PAGES IN

STRIKEOUT/SHADOW FORMAT

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Added text is shown as shaded.

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

3.3 ENGINEERED SAFETY FEATURES

Applicability

Applies to the operating status of the Engineered Safety Features.

Objective

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

Specifications

The following specifications apply except during low-temperature physics tests.

A. SAFETY INJECTION AND RESIDUAL HEAT REMOVAL SYSTEMS

1. The average reactor coolant temperature shall not be ~~made critical~~ heated above 350°F except for low-temperature physics tests, unless the following conditions are met:

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

   b. Deleted

   c. The four accumulators are pressurized to a minimum of 598 psig and a maximum of 685 psig and each contains a minimum of 723 ft^3 and a maximum of 875 ft^3 of water with a boron concentration of at least 2000 ppm. None of these four accumulators may be isolated.

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

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

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

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

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

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

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

k. The refueling water storage tank low-level alarms are operable and set to alarm between 74,200 gallons and 99,000 gallons of water in the tank.

2. ~~During power operation, t~~The requirements of 3.3.A.1 may be modified to allow any one of the following components to be inoperable at any one time. If the system is not restored to meet the requirements of 3.3.A.1 within the time period specified, the reactor shall be placed in the hot shutdown condition utilizing normal operating procedures. If the requirements of 3.3.A.1 are not satisfied within an additional 48 hours, the average reactor coolant temperature shall be ~~placed in the cold shutdown condition~~ cooled below 350°F utilizing normal operating procedures.

a. One safety injection pump may be out of service, provided the pump is restored to operable status within 24 hours and the remaining two pumps are operable.

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

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

d. Any valve required for the functioning of the system during and following accident conditions may be inoperable provided that it is restored to operable status within 24 hours and all valves in the system that provide the duplicate function are 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. <u>CONTAINMENT COOLING AND IODINE REMOVAL SYSTEMS</u>

1. The average reactor coolant temperature shall not be ~~made critical~~ heated above 350°F unless the following conditions are met:

a. The recirculation fluid pH control system shall be operable with ≥ 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, t~~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 average reactor coolant temperature shall be ~~placed in the cold shutdown condition~~ cooled below 350°F 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.

c. With the portion of the weld channel pressurization system inoperable, and it is determined that it is not repairable by any practicable means, then that portion may be disconnected from the system.

3. If the WC & PP System is not restored to an operable status within the time period specified, then:

a. If the reactor is critical, it shall be brought to the hot shutdown condition utilizing normal operating procedures. The shutdown shall start no later than at the end of the specified time period.

b. If the reactor is subcritical, the reactor coolant system temperature and pressure shall not be increased more than 25°F and 100 psi, respectively, over existing values.

c. In either case, if the WC & PP System is not restored to an operable status within an additional 48 hours, the reactor shall be brought to the cold shutdown condition utilizing normal operating procedures. The shutdown shall start no later than the end of the 48-hour period.

E. COMPONENT COOLING SYSTEM

1. The average reactor coolant temperature shall not be ~~made critical~~ heated above 350°F unless the following conditions are met:

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

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

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

2. ~~During power operation, t~~The requirements of 3.3.E.1 may be modified to allow one of the following components to be inoperable at any one time. If the system is not restored to meet the conditions of 3.3.E.1 within the time period specified, the reactor shall be placed in the hot shutdown condition utilizing normal

operating procedures. If the requirements of 3.3.E.1 are not satisfied within an additional 48 hours, the average reactor coolant temperature shall be ~~placed in the cold shutdown condition~~ cooled below 350°F utilizing normal operating procedures.

a. One of the three operable component cooling pumps may be out of service provided the pump is restored to operable status within 14 days. Component Cooling Pump 22 may be out of service if Emergency Diesel Generator 22 is out of service or if no emergency diesel generator is out of service.

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

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

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

F. <u>SERVICE WATER SYSTEM</u>

1. DESIGNATED ESSENTIAL HEADER

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

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

H. CONTROL ROOM AIR FILTRATION SYSTEM

1. The control room air filtration system shall be operable at all times when containment integrity is required.

2. From the date that the control room air filtration system becomes and remains inoperable for any reason, operations requiring containment integrity are permissible only during the succeeding 3.5 days. At the end of this 3.5 days period, if the conditions for the control room air filtration system cannot be met, the reactor shall be placed in the hot shutdown condition utilizing normal operating procedures. If the conditions are not satisfied within an additional 48 hours, the reactor shall be placed in the cold shutdown condition utilizing normal operating procedures.

I. CABLE TUNNEL VENTILATION FANS

1. The average reactor coolant temperature shall not be ~~made critical~~ heated above 350°F unless the two cable tunnel ventilation fans are operable.

2. ~~During power operation, t~~The requirement of 3.3.I.1 may be modified to allow one cable tunnel ventilation fan to be inoperable for seven days, provided the other fan is operable.

Basis

The normal procedure for starting the reactor is, first, to heat the reactor coolant to near operating temperature by running the reactor coolant pumps. The reactor is then made critical by withdrawing control rods and/or diluting boron in the coolant[1]. With this mode of start-up, the energy stored in the reactor coolant during the approach to criticality is substantially equal to that during power operation. Additionally, the steam line break accident analyses include cases where the unit is initially at hot shutdown conditions. For these cases, certain minimum engineered safeguards equipment is assumed to operate to mitigate and terminate the transient. For the above reasons, ~~and therefore~~ the minimum required engineered safeguards and auxiliary cooling systems are required to be operable with average reactor coolant temperature above 350°F. During low-temperature physics tests there is a negligible amount of stored energy in the reactor coolant; therefore, an accident comparable in severity to the Design Basis Accident is not possible, and the engineered safeguards systems are not required.

When the ~~reactor is critical~~ average reactor coolant temperature is above 350°F, the probability of sustaining both a major accident and a simultaneous failure of a safeguards component to operate as designed is necessarily very small. Thus operation ~~with the reactor critical~~ above 350°F with minimum safeguards operable for a limited period does not significantly increase the probability of an accident having consequences which are more severe than the Design Basis Accident.

The operable status of the various systems and components is to be demonstrated by periodic tests, defined by Specification 4.5. A large fraction of these tests will be performed while the reactor is operating in the power range. If a component is found to be inoperable, it will be possible in most cases to effect repairs and restore the system to full operability within a relatively short time. Inoperability of a single component does not negate the ability of the system to perform its function[2], but it reduces the redundancy provided in the reactor design and thereby limits the ability to tolerate additional equipment failures. If (1) the inoperable component is not repaired within the specified allowable time period, or (2) a second component in the same or related system is inoperable, the reactor will initially be put in the hot shutdown condition to provide for reduction of the decay heat from the fuel and consequent reduction of cooling requirements after a postulated loss-of-coolant accident. This will also permit improved access for repairs in some cases. After a limited time in hot shutdown, if the malfunction(s) are not corrected, the reactor will be placed in ~~the cold shutdown condition, utilizing normal shutdown and cooldown procedures. In the cold shutdown condition there is no possibility of an accident that would release fission products or damage the fuel elements.~~ a condition where the TS does not apply.

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 specified repair times do not apply to regularly scheduled maintenance of the engineered safeguards systems, which is normally to be performed during refueling shutdowns. The limiting times to repair are based on two considerations:

1. assurance with high reliability that the safeguard system will function properly if required to do so, and

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

Assuming the reactor has been operating at full-rated power for at least 100 days, 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 48 hours of going to the hot shutdown condition is considered indicative of a requirement for major maintenance, and therefore in such a case the average reactor coolant temperature is to be ~~put into the cold shutdown condition~~ cooled below 350°F.

Valves 1810, 744 and 882 are kept in the open position during plant operation to assure that flow passage from the refueling water storage tank will be available during the injection phase of a loss-of-coolant accident. As an additional assurance of flow passage availability, the valve motor operators are de-energized to prevent an extremely unlikely spurious closure of these valves to take place. This additional precaution is acceptable since failure to manually re-establish power to close valves 1810 and 882, following the injection phase, is tolerable as a single failure. Valve 744 will not need to be closed following the injection phase. The accumulator isolation valve motor operators are de-energized to prevent an extremely unlikely spurious closure of these valves from occurring when accumulator core cooling flow is required.

With respect to the core cooling function, there is some functional redundancy for certain ranges of break sizes. The measure of effectiveness of the Safety Injection System is the ability of the pumps and accumulators to keep the core flooded or to reflood the core rapidly where the core has been uncovered for postulated large area ruptures. The result of the performance is to sufficiently limit any increase in clad temperature below a value where emergency core cooling objectives are met(9). The range of core protection as a function of break diameter provided by the various components of the Safety Injection System is presented in Figure 6.2-9 of the UFSAR.

The requirement regarding the maximum number of SI pumps that can be energized when RCS temperature is less than or equal to 305°F is discussed under Specification 3.1.A.

The containment cooling function is provided by two independent systems: (1) fan-coolers and (2) containment spray. ~~During normal power operation, t~~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)(12). 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 ≥ 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~~ with average reactor coolant temperature above 350°F. This is an abnormal operating situation, in that the normal plant operating procedures require that an inoperable fan-cooler be repaired as soon as practical.

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

The Component Cooling System is different from the system discussed above in that the pumps are so located in the Auxiliary Building as to be accessible for repair after a loss-of-coolant accident(6). During the recirculation phase following a loss-of-coolant accident, only one of the three component cooling pumps is required for minimum safeguards(7). With two operable component cooling pumps, 100% redundancy will be 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 cable tunnel is equipped with two temperature-controlled ventilation fans. Each fan has a capacity of 21,000 cfm and is connected to a 480v bus. One fan will start automatically when the temperature in the tunnel reaches 100°F. Under the worst conditions, i.e., loss of outside power and all the Engineered Safety Features in operation, one ventilation fan is capable of maintaining the tunnel temperature below 104°F. Under the same worst conditions, if no ventilation fans were operating, the natural air circulation through the tunnel would be sufficient to limit the gross tunnel temperature to below the tolerable value of 140°F. However, in order to provide for ample tunnel ventilation capacity, the two ventilation fans are required to be operable when the average reactor coolant temperature is ~~made critical~~ above 350°F. If one ventilation fan is found inoperable, the other fan will ensure that cable tunnel ventilation is available.

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

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

The specified quantities of water for the RWST include unavailable water (4687 gals) in the tank bottom, inaccuracies (24,800 gals) in the alarm setpoints, the minimum quantity required during the injection (246,000 gals)[12] for accident mitigation and the minimum quantity required during the recirculation phase (60,000 gals) for accident mitigation. The minimum RWST inventory (i.e., 345,000 gals) provides approximately 9,500 gallons margin.

3.7 AUXILIARY ELECTRICAL SYSTEMS

Applicability

Applies to the availability of electrical power for the operation of plant auxiliaries.

Objective

To define those conditions of electrical power availability necessary (1) to provide for safe reactor operation and (2) to provide for the continuing availability of engineered safety features.

Specifications

A. The average reactor coolant temperature shall not be ~~made critical~~ heated above 350°F without:

1. at least two 138 kV lines from offsite sources to Buchanan Substation fully operational (excluding the Refuse Energy Services Company plant),

2. the 6.9 kV buses 5 and 6 energized from the 138 kV sources at Buchanan Substation through the 138/6.9 kV Station Auxiliary Transformer,

3. one 13.8 kV source from at least one 138/13.8 kV transformer at Buchanan available and a 13.8/6.9 kV transformer available to supply 6.9 kV power,

4. the four 480-volt buses 2A, 3A, 5A and 6A energized and the bus tie breakers between buses 5A and 2A and between buses 3A and 6A open,

5. three diesel generators operable with a minimum onsite supply of 6,334 gallons of fuel available in each of the individual storage tanks and 29,000 gallons of fuel available at the Buchanan Substation, or onsite other than the normal supply tanks, and

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

B. ~~During power operation,~~ With average reactor coolant temperature above 350°F, the following components may be inoperable:

1. ~~Power operation~~ Operation with average reactor coolant temperature above 350°F may continue for seven days provided the 138 kV and the 13.8 kV sources of offsite power are available in compliance with 3.7.A with any combination of or all of the following inoperable:

   a. One diesel generator unavailable provided the remaining diesel generators with their associated fuel oil systems and the required engineered safety features associated with these diesel generator buses are operable.

   b. One diesel generator fuel oil system unavailable. This system consists of a fuel oil storage tank with 6,334 gallons of fuel available, a fuel oil transfer pump and associated piping, valves and instrumentation, or

   c. One diesel fuel oil supply header unavailable.

   If a diesel generator becomes inoperable due to any cause other than planned maintenance or testing, the remaining diesel generators shall be tested to ensure operability.

2. ~~Power operation~~ Operation with average reactor coolant temperature above 350°F may continue for 72 hours provided the 138 kV power source from Buchanan Substation is supplying 6.9 kV buses 5 and 6 through the 138/6.9 kV Station Auxiliary Transformer and the three diesel generators are operable with either of the following.

   a. Only one 138 kV line from an offsite source to Buchanan Substation is operable, (excluding the Refuse Energy Services Company plant).

   b. The 13.8 kV source of offsite power is not available from a 138/13.8 kV transformer at Buchanan Substation, but is available from a gas turbine.

   This operation may be extended beyond 72 hours provided the limiting condition is reported to the NRC within the subsequent 24-hour period with an outline of the plans for restoration of an offsite 138 kV supply line or re-establishing a 138/13.8 kV supply to Buchanan Substation for the 13.8/6.9 kV supply to buses 5 and 6.

3. ~~Power operation~~ Operation with average reactor coolant temperature above 350°F may continue for 24 hours, if the entire 138 kV or the entire 13.8 kV source of power is lost, provided the three diesel generators are operable. This operation may be extended beyond 24 hours provided the limiting condition is reported to the NRC within the subsequent 24-hour period with an outline of the plans for restoration of offsite power.

4. When 6.9 kV buses 5 and 6 are supplied through a 13.8/6.9 kV transformer, in addition to satisfying the requirements of Specification 3.7.B.3 above, the 6.9 kV bus tie breaker control switches 1-5, 2-5, 3-6, and 4-6 in the CCR shall be placed in the "pull-out" position and tagged to prevent an automatic transfer of the 6.9 kV buses 1, 2, 3 and 4.

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

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

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

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

C. Gas Turbine Generators:

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

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