UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

December 12, 1997

Mr. Oliver D. Kingsley, President
Nuclear Generation Group
Commonwealth Edison Company
Executive Towers West III
1400 Opus Place, Suite 500
Downers Grove, IL 60515

SUBJECT: ISSUANCE OF AMENDMENTS (TAC NOS. M98754 AND M98755)

Dear Mr. Kingsley:

The U.S. Nuclear Regulatory Commission (Commission) has issued the enclosed Amendment No. 95 to Facility Operating License No. NPF-37 and Amendment No. 95 to Facility Operating License No. NPF-66 for the Byron Station, Unit Nos. 1 and 2, respectively. The amendments are in response to your application dated May 6, 1997. Additional information was provided on July 30, 1997.

The amendments will change Technical Specification 3/4.7.5, "Ultimate Heat Sink" and the associated Bases to support steam generator replacement and incorporate recent Ultimate Heat Sink (UHS) design evaluations.

Commonwealth Edison Company (ComEd or the licensee) will be replacing the original Westinghouse D4 steam generators at Byron, Unit 1, with Babcock and Wilcox International steam generators. The replacement steam generators have a larger primary side volume which results in a larger mass/energy release to the containment in the event of a loss-of-coolant accident (LOCA) and a corresponding increase in the heat load to the UHS.

In addition, ComEd has recently identified several issues requiring resolution to support full qualification of the UHS.

The Technical Specifications (TS) changes revise the LCO for the minimum water level in each essential service water (ESW) cooling tower basin, the maximum ESW pump discharge temperature and the number of fans supporting heat removal.

CP-1

A copy of the Safety Evaluation is also enclosed. The Notice of Issuance will be included in the Commission's biweekly Federal Register notice.

Sincerely,

ORIGINAL SIGNED BY:

George F. Dick, Jr., Senior Project Manager
Project Directorate III-2
Division of Reactor Projects - III/IV
Office of Nuclear Reactor Regulation

Docket Nos. STN 50-454 and STN 50-455

Enclosures:
1. Amendment No. 95 to NPF-37
2. Amendment No. 95 to NPF-66
3. Safety Evaluation

cc w/encl: see next page

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Docket Nos. STN 50-454 and STN 50-455

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1. Amendment No. 95 to NPF-37
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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

COMMONWEALTH EDISON COMPANY

DOCKET NO. STN 50-454

BYRON STATION, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 95
License No. NPF-37

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Commonwealth Edison Company (the licensee) dated May 6, 1997, as supplemented July 30, 1997, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. NPF-37 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A as revised through Amendment No. 95 and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto, are hereby incorporated into this license. The licensee shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of the date of its issuance and shall be implemented within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION

George F. Dick, Jr., Senior Project Manager
Project Directorate III-2
Division of Reactor Projects - III/IV
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: December 12, 1997

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

COMMONWEALTH EDISON COMPANY

DOCKET NO. STN 50-455

BYRON STATION, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No.95
License No. NPF-66

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Commonwealth Edison Company (the licensee) dated May 6, 1997, as supplemented July 30, 1997, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. NPF-66 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A (NUREG-1113), as revised through Amendment No.95 and revised by Attachment 2 to NPF-66, and the Environmental Protection Plan contained in Appendix B, both of which were attached to License No. NPF-37, dated February 14, 1985, are hereby incorporated into this license. Attachment 2 contains a revision to Appendix A which is hereby incorporated into this license. The licensee shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of the date of its issuance and shall be implemented within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION

George F. Dick, Jr., Senior Project Manager
Project Directorate III-2
Division of Reactor Projects - III/IV
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: December 12, 1997

ATTACHMENT TO LICENSE AMENDMENT NOS. 95AND95

FACILITY OPERATING LICENSE NOS. NPF-37 AND NPF-66

DOCKET NOS. STN 50-454 AND STN 50-455

Revise the Appendix A Technical Specifications by removing the pages identified below and inserting the attached pages. The revised pages are identified by the captioned amendment number and contain marginal lines indicating the area of change.

Remove Pages	Insert Pages
3/4 7-13	3/4 7-13
3/4 7-14	3/4 7-14
3/4 7-14a	3/4 7-14a
3/4 7-15	3/4 7-15
B 3/4 7-3	B 3/4 7-3
B 3/4 7-4	B 3/4 7-4
---	B 3/4 7-4a

3/4.7.5 ULTIMATE HEAT SINK

LIMITING CONDITIONS FOR OPERATION

3.7.5 The ultimate heat sink (UHS) shall be OPERABLE with:

a. A water level in each of the UHS cooling tower basins of at least 60%,

b. A total of at least 6 fans OPERABLE (high speed),

c. Two OPERABLE essential service water makeup pumps,

d. An essential service water pump discharge temperature of
   1) ≤80°F, or
   2) ≤90°F, with 6 OPERABLE fans running in high speed; or
   3) ≤96°F, with > 6 OPERABLE fans running in high speed.

e. Two OPERABLE UHS cooling tower basin level switches,

f. The National Weather Service (NWS) does not forecast the Rock River level to exceed 702.0 feet MSL,

g. Rock River water level greater than 670.6 feet MSL, and

h. The National Weather Service (NWS) has not issued a tornado watch that includes the Byron Site Area.

APPLICABILITY: MODES 1, 2, 3, and 4

ACTION:

a. With a water level of less than 60% in either UHS cooling tower basin, restore the water level to at least 60% in each UHS cooling tower basin within 6 hours or be in HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

b. With only 5 fans OPERABLE, within 1 hour verify the 5 OPERABLE fans are capable of being powered by their respective emergency diesel generators. Restore at least 6 fans to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and COLD SHUTDOWN within the following 30 hours.

LIMITING CONDITION FOR OPERATION (Continued)

ACTION (Continued)

c. With one essential service water makeup pump inoperable, within 72 hours either:

1) Restore the inoperable essential service water makeup pump to OPERABLE status, or

2) Verify that the same train deep well pump is OPERABLE with both UHS cooling tower basin levels ≥ 90%. Continue to verify both basin levels are ≥ 90% every two hours and restore the inoperable essential service water makeup pump to OPERABLE status within *7 days. (*This can be extended to 14 days for Essential Service Water Makeup pump inspection and extended maintenance during the time when at least one unit is in MODE 5 or 6.) The provisions of Specification 3.0.4 are not applicable.

3) Otherwise be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

d. With the essential service water pump discharge water temperature not meeting the above requirement, be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

e. 1) With one UHS cooling tower basin switch inoperable:

a) Restore the level switch to OPERABLE status within 72 hours or verify both basin levels are ≥ 90% within the next hour and every 2 hours thereafter. The provisions of Specification 3.0.4 are not applicable.

b) Otherwise be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

2) With both UHS cooling tower basin level switches inoperable:

a) Restore one level switch to OPERABLE status within 1 hour and follow the provisions of 3.7.5.e.1 above, or verify both basin levels are ≥ 90% within the next hour and every 2 hours thereafter. The provisions of Specification 3.0.4 are not applicable.

b) Otherwise be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

3) With any UHS cooling tower basin level switch inoperable for more than 30 days, prepare and submit a special report to the Commission pursuant to Specification 6.9.2 within the next 10 days outlining the cause of the inoperability and the plans for restoring the switch(es) to OPERABLE status.

f. With Rock River water level forecasted by NWS to exceed 702.0 feet MSL:

LIMITING CONDITION FOR OPERATION (Continued)

ACTION (Continued)

1) Within one hour verify that both deep well pumps are OPERABLE with both UHS cooling tower basin levels ≥ 90% and at least once every 2 hours thereafter, verify both basin levels are ≥ 90%. The provisions of Specification 3.0.4 are not applicable.

2) With one deep well pump inoperable restore both deep well pumps to OPERABLE status with both basin levels ≥ 90% before the Rock River level exceeds 702 feet MSL or within 72 hours, whichever comes first and follow provisions of ACTION f.1).

3) Otherwise be in HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

g. With Rock River water level at or below 670.6 feet MSL within one hour verify Rock River level and flow, and:

1) If Rock River level > 664.7 feet MSL and flow ≥ 700 cfs verify Rock River level > 664.7 feet MSL and flow ≥ 700 cfs every 12 hours thereafter. The provisions of Specification 3.0.4 are not applicable.

2) If Rock River level ≤ 664.7 feet MSL or flow < 700 cfs, within one hour:

a) Verify that both deep well pumps are OPERABLE with both UHS cooling tower basin levels ≥ 90% and at least once every 2 hours thereafter, verify both basin levels are ≥ 90%. The provisions of Specification 3.0.4 are not applicable.

b) With one deep well pump inoperable, within 72 hours restore both deep well pumps to OPERABLE status with both basin levels ≥ 90% and follow provisions of ACTION g.2)a).

c) Otherwise be in at least HOT STANDBY within the next 6 hours and at least HOT SHUTDOWN within the following 6 hours and at least COLD SHUTDOWN within the subsequent 24 hours.

h) With a tornado watch issued by NWS that includes Byron site area:

1) Within one hour verify that both deep well pumps are OPERABLE with both UHS cooling tower basin levels ≥ 90% and at least once every 2 hours thereafter, verify both basin levels ≥ 90%. The provisions of Specification 3.0.4 are not applicable.

2) With one deep well pump inoperable, within 30 minutes take action to restore both deep well pumps to OPERABLE status with both basin levels ≥ 90% and at least once every 2 hours thereafter, verify both basin levels ≥ 90%.

3) Otherwise be in HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.7.5 The UHS shall be determined OPERABLE at least once per:

a. 24 hours by verifying the water level in each UHS cooling tower basin to be greater than or equal to 60%,

b. 24 hours by verifying the essential service water pump discharge water temperature is within its limit,

c. 24 hours by verifying that the Rock River water level is within its limits,

d. 31 days by starting from the control room each UHS cooling tower fan that is required to be OPERABLE and not already in high speed operation and operating each of those fans in high speed for at least 15 minutes,

e. 31 days by

1) Verifying that the fuel supply for each diesel powered essential service water makeup pump is at least 36% of the fuel supply tank volume,

2) Starting the diesel from ambient conditions on a low basin level test signal and operating the diesel powered pump for at least 30 minutes,

3) Verifying that each valve (manual, power operated, or automatic) in the flow path is in its correct position,

4) Starting each deep well pump and operating it for at least 15 minutes and verifying that each valve (manual, power-operated, or automatic) in the flow path is in its correct position,

f. 92 days by verifying that a drain sample of diesel fuel from the fuel storage tank, obtained in accordance with ASTM D4057-1981, is within the acceptable limits specified in Table 1 of ASTM-D975-1977 when checked for viscosity, water, and sediment,

g. 18 months by performing a CHANNEL CALIBRATION on each of the UHS cooling tower basin level switches,

h. 18 months by subjecting each diesel that powers an essential service water makeup pump to an inspection in accordance with procedures prepared in conjunction with its manufacturer's recommendations for the class of service and by cycling each testable valve in the flow path through at least one complete cycle of full travel,

i. 18 months by verifying each deep well pump will provide at least 550 gpm flow rate, and

j. 18 months by visually inspecting and verifying no abnormal breakage or degradation of the fill materials in the UHS cooling tower.

3/4.7.1.5 MAIN STEAM LINE ISOLATION VALVES

The OPERABILITY of the main steam line isolation valves ensures that no more than one steam generator will blowdown in the event of a steam line rupture. This restriction is required to: (1) minimize the positive reactivity effects of the Reactor Coolant System cooldown associated with the blowdown, and (2) limit the pressure rise within containment in the event the steam line rupture occurs within containment. The OPERABILITY of the main steam isolation valves within the closure times of the Surveillance Requirements are consistent with the assumptions used in the safety analyses.

3/4.7.2 STEAM GENERATOR PRESSURE/TEMPERATURE LIMITATION

The limitation on steam generator pressure and temperature ensures that the pressure-induced stresses in the steam generators do not exceed the maximum allowable fracture toughness stress limits. The limitations of 70°F and 200 psig are based on a steam generator RT_{NDT} of 60°F and are sufficient to prevent brittle fracture.

3/4.7.3 COMPONENT COOLING WATER SYSTEM

The OPERABILITY of the Component Cooling Water System ensures that sufficient cooling capacity is available for continued operation of safety-related equipment during normal and accident conditions. The redundant cooling capacity of this system, assuming a single failure, is consistent with the assumptions used in the safety analyses.

3/4.7.4 ESSENTIAL SERVICE WATER SYSTEM

The OPERABILITY of the Essential Service Water System ensures that sufficient cooling capacity is available for continued operation of safety-related equipment during normal and accident conditions. The redundant cooling capacity of this system, assuming a single failure, is consistent with the assumptions used in the accident conditions within acceptable limits.

The OPERABILITY of the unit crosstie along with the availability of an Essential Service Water pump in the shut down unit ensures the availability of sufficient redundant cooling capacity for the operating unit.

3/4.7.5 ULTIMATE HEAT SINK

The limitations on the ultimate heat sink ensure 1) sufficient cooling capacity is available for continued operation of safety related equipment during normal and accident conditions and 2) adequate inventory is available to provide a 30-day cooling water supply to safety related equipment. The limiting design basis event for the UHS basin temperature is a loss of coolant accident coincident with a loss of offsite power on one unit, in conjunction with the non-accident unit proceeding to an orderly shutdown and cooldown from

ULTIMATE HEAT SINK (Continued)

maximum power to Mode 5, assuming a single active failure. The limiting design basis event for the UHS makeup is a two unit trip from full power, assuming a single active failure and loss of the normal auxiliary feedwater supply source.

The minimum UHS cooling tower basin water level and the service water pump discharge temperature limits assure that adequate thermal capacity is available in the SX water inventory to absorb the initial accident heat input. Depending on basin temperature, six or more fans are required to be available or running so that the required number of fans are available after a single active failure to assure basin temperature will remain less than 100°F. SX basin temperature and SX pump discharge temperature are essentially the same since the piping from the tower basins to the pumps is underground and the temperature increase across the SX pump at accident flow rates is negligible. Temperature is measured at the discharge of each SX pump.

The UHS cooling tower basin inventory is available for transporting heat from safety related equipment during normal and accident conditions. Due to evaporation, blowdown, and auxiliary feedwater supply the basin inventory alone is not adequate for the required 30-day cooling water supply, therefore makeup systems are provided to replenish the basin inventory. The makeup systems are designed to provide adequate makeup for normal and accident conditions concurrent with the use of the essential service water system as the supply source for the auxiliary feedwater system, assuming a single active failure.

Adequate inventory is maintained by the SX makeup system that uses the Rock River as a water source. The SX makeup system is designed to withstand all design basis natural phenomena events and combination of events except for seismic events during low Rock River flow or level (loss of SX makeup pump suction), tornado, and river flood. A backup makeup system uses the deep wells as a water source. The deep well system is designed for seismic, tornado, and river flood events.

Each essential service water makeup pump is powered by a diesel engine with a fuel supply adequate for approximately 3 days of operation. Achievement of the design basis 30-day operation is dependent upon successful implementation of plant procedures to replenish the fuel supply following design basis events.

The operability requirements for the basin level switches, Rock River level limitations, and tornado watch limitations assure that the SX makeup system is available to provide makeup water. The corresponding actions assure that the backup deep well system is available and increases the minimum

ULTIMATE HEAT SINK (Continued)

cooling tower basin level to assure that adequate basin water inventory is available after a two hour delay to manually start the deep well pumps after an accident.

3/4.7.6 CONTROL ROOM VENTILATION SYSTEM

The OPERABILITY of the Control Room Ventilation System ensures that: (1) the ambient air temperature does not exceed the allowable temperature for continuous duty rating for the equipment and instrumentation cooled by this system, and (2) the control room will remain habitable for operations personnel during and following all credible accident conditions. Operation of the system with the heaters operating for at least 10 continuous hours in a 31-day period is sufficient to reduce the buildup of moisture on the adsorbers and HEPA filters. The OPERABILITY of this system in conjunction with control room

UNITED STATES
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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 95 TO FACILITY OPERATING LICENSE NO. NPF-37

AND AMENDMENT NO. 95 TO FACILITY OPERATING LICENSE NO. NPF-66

COMMONWEALTH EDISON COMPANY

BYRON STATION, UNIT NOS. 1 AND 2

DOCKET NOS. STN 50-454 AND STN 50-455

1.0 INTRODUCTION

By letter dated May 6, 1997, Commonwealth Edison Company (ComEd, the licensee) proposed changes to the plant technical specifications (TS) for the Byron Station, Units 1 and 2. ComEd provided additional information by letter dated July 30, 1997. The July 30, 1997, submittal provided additional clarifying information that did not change the initial proposed no significant hazards consideration determination which was published in the Federal Register on July 2, 1997, (62 FR 38847). The proposed changes would revise TS 3/4.7.5 "Ultimate Heat Sink" and its associated Bases section to support steam generator (SG) replacement (on Unit 1 only) and incorporate recent ultimate heat sink (UHS) design evaluations. Although the SG replacement only affects Unit 1, the license amendment and TS change applies to both units because they share the UHS and have common TS.

The replacement SG have a larger primary side volume which results in a larger mass and energy release to the containment in the event of a loss-of-coolant accident (LOCA) and a corresponding increase in the heat load to the UHS. In addition, the licensee identified several issues that required resolution to support full qualification of the UHS. Specifically, the proposed changes would revise the limiting conditions for operation (LCOs) for the UHS as follows:

3.7.5.a The minimum required water level in the UHS cooling tower basins would be increased from 50 percent to 60 percent.

3.7.5.b The current LCO would be changed from a total of six fans OPERABLE to a total of "at least" six fans OPERABLE.

3.7.5.d Currently this LCO requires six cooling tower fans to be running (instead of just operable as required by LCO 3.7.5.b) in high speed whenever the essential service water (ESW) pump discharge temperature exceeds 80 degrees Fahrenheit (°F) up to the maximum temperature of 96°F. The proposed change would require six fans to be running in high speed whenever the discharge temperature exceeds 80°F up to an intermediate temperature of 90°F; above 90°F (and up to the 96°F maximum temperature limit), greater than six fans would be required to be running in high speed.

As a result of the increase in required minimum basin water level, a number of inoperable equipment action statements have also been changed to reflect the new minimum level. Currently these action statements require verification that both cooling water tower basin levels

are greater than or equal to 82 percent (higher than the minimum requirement because of certain inoperable equipment). The proposed changes would verify that these levels are greater than or equal to 90 percent when this same equipment becomes inoperable. Lastly, Surveillance Requirement (SR) 4.7.5.a (24-hour surveillance) would be revised to reflect verification of the 60 percent minimum water level in each basin instead of the current 50 percent minimum level. A similar change to the 24-hour surveillance for the ESW pump discharge temperature was not required because the SR references the limit specified in the LCO in lieu of a specific temperature.

2.0 EVALUATION

The UHS at Byron is shared between the two units and consists of two mechanical draft cooling towers and the makeup system that provides water to these cooling towers. The cooling towers are used as the heat sink for the shared ESW system during normal operation, emergency operation, and for safe shutdown. Each of the cooling towers consists of a water storage basin, four two-speed fans (low and high), four riser valves and two bypass valves. For the purposes of this evaluation, the referenced valves are considered part of the ESW system. Normal makeup is from the circulating water system, while safety-related makeup is provided from two independent ESW makeup pumps. Backup is provided by either of two deep well makeup pumps and is relied upon to allow continued operation in the event of ESW makeup pump failure, low river water level/flow, or a tornado watch.

The TS limitations on the UHS are intended to ensure sufficient cooling capacity and adequate water inventory are available in the event of a design basis LOCA in one unit in conjunction with shutdown and cooldown of the other unit. Specifying a minimum UHS basin water level and maximum ESW pump discharge temperature assures that adequate thermal capacity is available in the basin water inventory to absorb the initial accident heat input. Six of the eight cooling tower fans are required to be operable to meet the single active failure criterion without exceeding a maximum basin water temperature of 100°F throughout the event. Due to evaporation, blowdown, and potential auxiliary feedwater (AFW) system supply to the non-LOCA unit, the basin inventory alone is not sufficient for the required 30-day cooling water supply. Therefore, makeup systems are provided and are included in the UHS TS.

In addition to the increased post-accident heat load from Unit 1 due to SG replacement, the licensee identified several issues requiring evaluation and/or corrective action to support full qualification of the UHS. These issues include:

- Valve leakage through closed ESW cooling tower bypass and riser valves,
- reduced usable volume due to observed silting on the bottom of the basins and taking into account the anti-vortexing duct configuration,
- revised cooling tower blowdown flow rate and blowdown isolation time,
- new makeup scenarios for two unit trip from full power, and
- new temperature scenarios assuming only one cooling tower fan initially out-of-service (> 6 fans running in high speed).

The current supporting analyses did not account for leakage past closed bypass and riser isolation valves. The leakage past these valves has the effect of decreasing the percentage of

ESW flow cooled by the active cooling tower cells. Additionally, each operating riser has a drain line that diverts flow to the basin. This total leakage has been quantified and factored into the ESW system hydraulic analyses, which were used to compute flow rates in each of the riser and bypass lines. This more accurate representation of ESW flow is used in the revised basin temperature calculations.

The current TS supporting analyses also did not account for reduced basin water inventory available for use due to the existence of silting in the bottom of the basins and the anti-vortexing duct configuration. The effect of these items is to reduce the amount of water that can be considered available for use for heat removal and water inventory losses during postulated events.

Cooling tower blowdown flow rate and isolation time were considered in the current supporting analyses. Optimization of how much water to allow for blowdown, and when this blowdown should be isolated were reevaluated by the licensee. The blowdown flow used in the revised calculations has been maximized to facilitate better chemistry control.

The current basin makeup scenarios address a LOCA on one unit and an orderly shutdown of the non-LOCA unit. The current makeup calculation did not include AFW supply to the LOCA unit and simply modeled AFW to the non-LOCA unit at a constant flow rate. The AFW flow to the non-LOCA unit actually varies with time. This revised time dependent AFW consumption rate was high enough to raise the question as to whether a two-unit plant trip scenario may be more limiting than a LOCA scenario. The licensee's re-analysis has shown that the two unit plant trip from full power case is more limiting than the LOCA case (no makeup to the LOCA unit) for makeup considerations.

The current basin temperature calculations for initial temperatures >80°F and ≤96°F are based on six operable fans initially running in high speed. For initial basin temperatures ≤80°F, the current supporting calculations are based on no fans initially running in high speed (during normal operation the fans are in slow speed and are only shifted to high speed by operator action). Normally, more than six fans are maintained operable and capable of running in high speed. The licensee's revised calculations determined that in order to maintain the current level of operational flexibility (upper limit of 96°F), at least one additional fan initially running in high speed would be required for continued operation with ESW discharge temperatures greater than 90°F. Therefore, based on these revised calculations TS 3.7.5 was revised to reflect that for temperatures >90°F but ≤96°F, more than six operable fans must be running in high speed.

The licensee's proposed change to LCO 3.7.5.a would increase the required water levels in the basins from 50 percent to 60 percent. This is considered a change in the conservative direction because it requires a larger volume of water to be available for continued plant operation. The licensee's revised analysis assumes that the available basin water inventory has been reduced by the equivalent volume equal to an average of six inches of silt on the bottom of the basins. Periodic inspections are performed on the cooling tower basins and administrative controls are in place to assure that silt buildup will not be greater than an average of six inches in the basins. Additionally, the minimum basin level determined to be required by the analysis (56 percent) is less than the proposed new minimum level. Based on these conservatisms and a number of other conservative assumptions used in the licensee's analysis, the staff concludes that the results of the revised analysis and, thus, the proposed change to increase the minimum required basin levels to 60 percent based on that analysis, are acceptable.

LCO 3.7.5.b currently specifies "a total of 6 fans OPERABLE (high speed)." The licensee has proposed to clarify this LCO such that it will specify "a total of at least 6 fans OPERABLE (high speed)." Based on this change being a desired clarification to prevent possible misinterpretations of the LCO, the staff concludes that this proposed change is acceptable.

The licensee's proposed change to LCO 3.7.5.d is also more conservative than the existing LCO because it requires more fans to be running in high speed when ESW discharge temperature is greater than 90°F. The revised temperature analysis is more conservative than the current supporting analysis because the revisions to the analysis were all in the conservative direction. These include a larger heat input from the replacement SG, a decrease in the percentage of ESW cooled by the active cooling tower cells to account for bypass leakage, and a reduced volume of water available due to silt buildup and the anti-vortex configuration. No credit was taken for ambient heat dissipation in passive cooling tower cells (i.e., those cells with riser valves open, but the fans off). Also, no credit was taken for the cooling contribution from the makeup flow of any of the makeup systems. The staff has determined that the licensee's revised analysis is based on conservative assumptions including the most limiting single active failure as documented in the licensee's July 30, 1997, submittal in response to the staff's request for additional information. The licensee's proposed change to LCO 3.7.5.d is, therefore, acceptable.

The licensee's proposed change to ACTION 3.7.5.a revises the basin water level at which the specified actions are taken, bringing the action statement into agreement with the revised LCO 3.7.5.a. The specified actions to be taken have not been revised. This proposed change is necessary for consistency and is, therefore, acceptable.

A number of the current action statements for TS 3.7.5 (ACTIONS c.2, e.1.a and 2.a, f.1 and 2, g.2.a and 2.b, and h.1 and 2) identify that the basin water levels must be maintained above 82 percent if certain equipment becomes inoperable. The licensee has proposed to increase this level to 90 percent if this same equipment becomes inoperable. The revised analysis showed that under the conditions of the inoperable equipment, a level of 86 percent would now be required to meet the acceptance criteria for water volume and temperature. Since the proposed new limit (90 percent) is greater than shown to be necessary by the licensee's analysis (86 percent), the staff concludes that the proposed changes to the action statements are acceptable.

The licensee's proposed change to SR 4.7.5.a requires 24-hour verification of basin water level greater than or equal to 60 percent in lieu of 50 percent. This change is necessary for consistency with the revised LCO requirement. Based on the staff's acceptance of the proposed LCO, the proposed change to SR 4.7.5 is also acceptable.

The licensee has also revised the Bases section for TS 3/4.7.5 to reflect the revised analyses and the proposed changes to the UHS specification. The staff has reviewed the revised Bases and determined that the revisions are consistent with the revised analyses and TS changes.

3.0 CONCLUSION

Based on its review and evaluation as described above, the staff has concluded that the proposed changes to TS 3/4.7.5 are conservative and are based on supporting analyses which ensure that the UHS will continue to meet the guidelines of Regulatory Guide 1.27, "Ultimate Heat Sink," with respect to maintaining a 30-day post-LOCA water supply and not exceeding design basis temperatures to safety-related equipment (100°F) throughout the event. The staff, therefore, concludes that the proposed changes are acceptable.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Illinois State official was notified of the proposed issuance of the amendments. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendments change a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and change surveillance requirements. The NRC staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendments involve no significant hazards consideration, and there has been no public comment on such finding (62 FR 35847). Accordingly, the amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendments.

6.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendments will not be inimical to the common defense and security or to the health and safety of the public.

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