Commonwealth Edison Company
LaSalle Generating Station
2601 North 21st Road
Marseilles, IL 61341-9757
Tel 815-357-6761

ComEd

February 23, 2000

United States Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555

LaSalle County Station, Units 1 and 2
Facility Operating License Nos. NPF-11 and NPF-18
NRC Docket Nos. 50-373 and 50-374

Subject: Response to Request for Additional Information
License Amendment Request for Power Uprate Operation

References: (1) Letter from R. M. Krich, Commonwealth Edison (ComEd) Company, to U.S. NRC, "Request for License Amendment for Power Uprate Operation," dated July 14, 1999.

(2) Letter from D. M. Skay, U.S. NRC, to , Commonwealth Edison (ComEd) Company, "Request for Additional Information – LaSalle County Station, Units 1 and 2 (TAC Nos. MA6070 and MA6071) (the letter contains 7 questions), dated December 27, 1999.

In the Reference 1 letter, pursuant to 10 CFR 50.90, we proposed to operate both LaSalle County Stations at a uprate power level of 3489 Megawatts Thermal (MWT). In the Reference 2 letter, the NRC requested additional information concerning the proposed amendment to support their review. The attachment to this letter provides our response to the request for additional information.

The no significant hazards consideration, submitted in Reference 1, remains valid for the information attached.

A001

Should you have any questions concerning this letter, please contact Mr. Frank A. Spangenberg, III, Regulatory Assurance Manager, at (815) 357-6761, extension 2383.

Respectfully,

Jeffrey A. Benjamin
Site Vice President
LaSalle County Station

Attachment

cc: Regional Administrator – NRC Region III
NRC Senior Resident Inspector – LaSalle County Station

STATE OF ILLINOIS)

IN THE MATTER OF)

COMMONWEALTH EDISON COMPANY)

LASALLE COUNTY STATION - UNIT 1 & UNIT 2) Docket Nos. 50-373
50-374

Subject: Response to Request for Additional Information License Amendment Request for Power Uprate Operation

AFFIDAVIT

I affirm that the content of this transmittal is true and correct to the best of my knowledge, information and belief.

Jeffrey A. Benjamin
Site Vice President
LaSalle County Station

Subscribed and sworn to before me, a Notary Public in and for the State above named, this 23rd day of February, 2000.
My Commission expires on 10-1, 2000.

OFFICIAL SEAL
DEBRA J. FEENEY
NOTARY PUBLIC, STATE OF ILLINOIS
MY COMMISSION EXPIRES10-1-2000

Debra J. Feeney
Notary Public

Question 1:

In Section 6.1.1 of the "Power Uprate Safety Analysis Report for LaSalle County Station," NEDC-32701P, dated July 1999, it is noted that an offsite power grid stability uprate review determined the electrical equipment and grid stability adequacy. Please provide a concise description of what this grid stability uprate review consisted of and include in this description the major assumptions for this review and the resulting primary review findings and conclusions. In addition, please explain in detail why the 345 kV switchyard equipment and stability remain adequate with the 345 kV switchyard circuit breaker 1-2 local breaker backup timer settings reduced.

Response 1:

The grid stability uprate review consisted of the following types of studies: steady state power flow analysis, voltage stability analysis, and transient stability analysis. The steady state power flow analysis reviewed the steady state loading on the transmission system with the uprate at LaSalle modeled. The steady state power flow analysis assessed the risk of facility overload caused by various contingencies (line outages, transformer outages, etc.). The power flow studies did not identify any significant additional risks with the LaSalle uprate included. The purpose of the voltage stability study is to identify the maximum loading the transmission system can withstand before a voltage collapse occurs. The worst case contingencies for voltage stability were reviewed with the LaSalle uprates included. While the voltage collapse point did decrease slightly with the LaSalle uprate included, it was still within ComEd's planning criteria.

Transient Stability studies assessed the risk of generator instability after severe faults located at or near the generating station. For LaSalle, the worst case transient stability scenarios were simulated to test for stability. The scenarios tested for LaSalle included 3-phase faults at the LaSalle 345 kV bus followed by a circuit breaker failure; 3-phase faults at the LaSalle 345 kV bus coincident with a 345 kV line maintenance outage were also simulated. The conclusion from these studies was that transient stability can be maintained for these severe faults. However, these studies did identify a need to reduce the LBB (Local Breaker Backup) timer on 345 kV circuit breaker 1-2 at LaSalle.

The purpose of the LBB timer is to allow sufficient time for the primary circuit breaker to clear a fault. If the primary circuit breaker does not operate by the time the LBB timer expires, the backup circuit breakers on the 345 kV bus are tripped. There is margin built into the LBB timer to give the primary breaker ample time to operate. The transient stability studies identified a need to reduce the LBB timer on circuit breaker 1-2 by one cycle. Even with this reduction in the LBB timer setting, there is still an approximate 1.5 cycle margin between the LBB timer setting and the longest expected time for the primary circuit breaker to operate.

Question 2:

Please provide a discussion that addresses why the current capability to provide electric power from the transmission network to the LaSalle County Station unit emergency electrical buses will not be affected by the 345 kV switchyard breaker setting change and as such the station will continue to be in full conformance with General Design Criterion 17, "Electric Power Systems."

Response 2:

As discussed in response 1, the LBB timer setting change on 345 kV circuit breaker 1-2 maintains the pre-uprate level of generator transient stability. Consequently, there is no reduction in the existing capability of the 345 kV transmission system to provide adequate power to essential loads on safety-related busses. LaSalle County Station remains in conformance with General Design Criterion 17, Electric Power Systems.

Question 3:

Information provided in Section 6.1.1 of NEDC-32701P notes that the iso-phase bus ratings, the main power transformer ratings, the unit and system auxiliary power transformer ratings, the 345 kV switchyard equipment ratings, and generator voltage and current ratings bound the uprate operating conditions. Please provide the numerical rating values for each of these items and the expected numerical values for these items during operation at power uprated operating conditions. In addition, provide the maximum expected electrical power output megawatt value for uprated operating conditions and the current maximum electrical power output megawatt value.

Response 3:

Please refer to the following information:

EQUIPMENT	RATING	POWER UPRATE OUTPUT
Generator	"1,300.3" MVA 0.9 Power Factor (PF) 25 kV	"1,300.3" MVA 0.91 PF (based on 1,183.3 MWe) 25 kV
Isophase bus	32,000 A (Gen. Leads) 18,000 A (MPT Leads) 8,000 A (UAT Leads)	30,030 A @ 25 kV 15,015 A @ 25 kV (Note 1) 977 A @ 25 kV (Note 2)
Main Power Transformers	Two - 700 MVA @ 65 deg C rise	"1,300.3" MVA
Unit Aux Transformer	65 MVA @ 55 deg C rise 72.8 MVA @ 65 deg C rise	42.3 MVA (Note 3)
System Aux Transformer	65 MVA @ 55 deg C rise 72.8 MVA @ 65 deg C rise	42.3 MVA (Note 3)
345 kV Disconnect Sws.	2,800 A (Summer Normal)	2,121 A
345 kV Bus	3,350 A (Winter Emergency)	2,121 A
345 kV Overhead Leads	2,270 A (Summer Normal)	2,121 A
345 kV Circuit Breakers	2,260 A (Normal)	2,121 A

Note 1: Generator output divided equally between the two Main Power Transformers with the Auxiliary Transformer out-of-service (30,030÷2).

Note 2: Unit Auxiliary Transformer supplying 100% of the auxiliary load. The normal pre-uprate auxiliary load varies from 34 to 38 MWe, which is equivalent to approximately 42 MVA. The expected increase in auxiliary load for power uprate operation is approximately 0.3 MVA resulting in an auxiliary load of 42.3 MVA for power uprate operation. The isophase lead current is 977 A [(42.3 MVA x 1,000) ÷ (25 kV x 1.732)].

Note 3: During normal operation both the Unit Auxiliary and System Auxiliary Transformers concurrently supply the station auxiliary load of 42.3 MVA.

TURBINE-GENERATOR GROSS OUTPUT	
Current	**Power Uprate**
1,124.8 MWe @ 3.5" Hg	1,183.3 MWe @ 3.5" Hg (Rated) 1,218.6 MWe @ 3.5" Hg (Valves Wide Open)

Question 4:

Provide a discussion that addresses the impact of the power uprate on the load, voltage and short circuit current values for all levels of the station auxiliary electrical distribution system (including ac and dc).

Response 4:

Analysis indicates that power uprate impacts the loading on the Reactor Recirculation pump motors, Condensate/Condensate Booster pump motors, and the Heater Drain pump motors. The horsepower (hp) increases per pump have been calculated to be 21 hp, 73 hp, and 32 hp respectively. Except for the Reactor Recirculation pump hp increase, these hp increases result in additional analyzed loading on the affected 4 kV and 6.9 kV busses. These load increases have been determined to be negligible as summarized in the following paragraphs.

Analysis of the Reactor Recirculation pump motor loads indicates that the output of each of these pumps will increase to slightly less than 8,200 hp at 105% power. Evaluations of electrical loads currently used to represent operation at 100% power conservatively use the nameplate horsepower of 8,900 hp for loading on the 6.9 kV busses. Therefore, the bus loading at uprated conditions is bounded based on previous analyses for the Reactor Recirculation pump motors.

Analysis of the Condensate/Condensate Booster pump motor loads indicates that the output of each of these pumps will increase by 2.56%. Evaluations of electrical loads currently used to represent operation at 100% power use a value of 3,031 hp per pump for loading on the 6.9 kV busses. Evaluations of bus loadings at uprated conditions are being revised conservatively to 3,110 hp per pump to reflect the expected increase in hp. Although increased loading on the 6.9 kV busses results from the increased hp of the Condensate/Condensate Booster pumps, this increase is small and is more than offset by the conservatism in the Reactor Recirculation pump motor loading.

Analysis of the Heater Drain pump motor loads indicates that the output of each of these pumps will increase by 1.92%. Evaluations of electrical loads currently used to represent operation at 100% power use 1,710 hp in support of loading on the 4 kV busses. To maintain the conservatism in this analysis, evaluations of bus loadings at uprated conditions are being revised to 1,745 hp to reflect the expected increase in pump motor loading.

The previously discussed increases in loading for the Condensate/Condensate Booster and Heater Drain pumps add a maximum of 342 hp of analyzed load to the auxiliary power system. The loading increase on the auxiliary power system is approximately 0.5% of total analyzed load. This increase correlates to a maximum change in voltage at the 6.9 kV AC busses of 3.5 V and a change in voltage at the 4 kV AC busses feeding the Heater Drain pump motors of 1.3 V. These voltage decreases result in a maximum decrease of 0.05% of bus rated voltage, which is considered negligible and thus acceptable. Similarly, the connection loading increase on the affected busses is minimal and thus considered to be acceptable.

Power uprate operation does not change any electrical characteristics of the unit generator and 345 KV transmission system, or add any new motors or transformers that would increase the auxiliary system short circuit currents. Thus, no increase in the calculated short circuit current values is expected.

There are no load changes that affect the existing DC power system design. Operation at the uprated level does not change the existing design basis loading or revise any control logic; therefore, the DC power system is adequate.

Question 5:

The July 14, 1999, submittal does not contain any discussion addressing how the power uprate impacts the existing analysis performed for station blackout. Please discuss and verify that the assumptions for the existing station blackout analysis are valid for the power uprate conditions, particularly as they relate to issues such as heat-up analysis, equipment operability, and battery capacity.

Response 5:

5A: Impact Of Changed Parameters on Station Blackout (SBO) Condensate/Reactor Coolant Inventory Analyses

5A.1: Condensate Inventory

Power uprate results in an increase in decay heat which will impact the quantity of cooling water required to be supplied via the High Pressure Core Spray (HPCS) or Reactor Core Isolation Cooling (RCIC) systems. Therefore, the adequacy of condensate inventory required evaluation. A calculation was performed to determine if the suppression pool contains a sufficient amount of water for coping with a four hour SBO while performing a cooldown of the reactor. The calculation assumed that either the HPCS or the RCIC System will accomplish the cooldown. The calculation used the procedure of Section 7.2.1 of NUMARC 87-00, "Guidelines and Technical Basis for NUMARC Initiatives Addressing Station Blackout at Light Water Reactors," Revision 1, dated August 1991, to perform the assessment.

This evaluation assumed that:

a. Water is not available from the cycled condensate tanks,

b. The inventory lost through the safety relief valves and RCIC turbine does not return to the suppression pool, and

c. The reactor coolant system leakage is 61 gpm.

The reactor cooling water system losses are due to decay heat removal and cooldown via Main Steam-Safety-Relief Valve (MS-SRV) operations, reactor coolant system leakage, and RCIC turbine leakage. It is conservatively assumed that no mass returns to the suppression pool.

The calculation shows that for the uprate condition, the HPCS cooling mode requires 171,005 gallons of suppression pool water, and the RCIC cooling mode would require 171,125 gallons of suppression pool cooling water. This is significantly less than the required minimum suppression pool volume of 963,488 gallons.

5A.2: Reactor Coolant Inventory

Both RCIC and HPCS are designed to initiate and operate independently of Division 1 and 2 AC power. Since RCIC has the smaller capacity pump, it presents the most limiting case for analysis. An evaluation of the RCIC system has verified that core uncovery is prevented when the RCIC system operates within its pressure range and the vessel depressurization cooldown rate is maintained at less than 20 °F/hr. The RCIC system and the specified depressurization cooldown rate are sufficient to keep the core covered and prevent fuel cladding heatup for at least 4 hours into the event.

This analysis assumes:

a. The reactor is operating at full uprate power of 3489 MWt, dome pressure of 1,040 psia, and normal water level at time of initiation.

b. The reactor scrams at event initiation.

c. The MSIVs are fully closed in 5 seconds.

d. Feedwater flow ramps to zero in 5 seconds.

e. The 1979 ANSI/ANS 5.1 Standard, "Decay Heat Power in Light Water Reactors," decay heat correlation is used.

f. RCIC initiates automatically when water level drops to Level 2.

g. Operator action to control the maximum depressurization cooldown to a rate of 20°F/hr is assumed following RCIC startup.

5B: Impact of Changed Parameters on SBO Class 1E Battery Coping Analyses

As indicated in Updated Final Safety Analysis Report (UFSAR) Section 15.9.3.2, "Class 1E Battery Capacity," the required DC electrical loads for SBO are assumed to be energized for the entire four-hour SBO event plus recovery. Loads that are not required for SBO coping are shed via Station procedures. Power uprate will not affect the equipment required to support SBO nor will it impact the loads that are required to be shed. Since the required SBO DC loads were conservatively assumed energized over the entire SBO duration, power uprate will not result in any changes to parameters associated with the SBO Class 1E Battery coping assessment.

5C: Impact of Changed Parameters on SBO Compressed Air Coping Analysis

Power uprate could result in an increase in the number of MS-SRV actuations as a result of the increase in decay heat. An SBO coping assessment determined the adequacy of the Automatic Depressurization System – nitrogen bottle capacity. With four bottles available, the calculation determined that a total of 72 MS-SRV actuations can be supported.

The calculation indicated that, for the uprate conditions, a total of 46 MS-SRV actuations are predicted based on a cooldown rate of 20 °F/hr and a 4 hour coping period. Therefore the nitrogen bottle capacity supports the required actuations with margin.

5D: Impact of Changed Parameters on SBO Loss of Heating Ventilation and Air Conditioning (HVAC) Analyses

5D.1: Auxiliary Electric Equipment Rooms (AEERs)

The heat load in the AEERs is due to emergency DC lighting and energized equipment required to cope with the SBO event. Power uprate does not impact the quantity of emergency DC lighting or coping equipment. Also, since the existing analyses assume the heat loads associated with lighting and equipment are applied over the entire 4 hour SBO duration, power uprate has no effect on the duration of these loads. The heat loads in rooms adjacent to the AEERs are not affected significantly by power uprate. Therefore, the temperature transients for the AEERs, following an SBO at power uprate, are not expected to depart from the pre-uprate results as documented in UFSAR Table 15.9-3, "Station Blackout Coping Capability."

5D.2: Control Room

The heat load in the Control Room is due to emergency DC lighting and energized equipment required to cope with the SBO event. Power uprate does not impact the quantity of emergency DC lighting or energized coping equipment in the Control Room. Also, since the existing analyses assume the heat loads associated with lighting and equipment are applied over the entire 4 hour SBO duration, power uprate has no effect on the duration of these loads. The heat loads in rooms adjacent to the Control Room are not expected to increase. Therefore, the temperature transient for the Control Room, following an SBO at power uprate, is not expected to depart from the pre-uprate results as documented in UFSAR Table 15.9-3.

5D.3: RCIC Room

A calculation was performed to determine the LaSalle Station Units 1&2 RCIC room temperature response to station blackout at uprate conditions. The heat load in the RCIC room is due to emergency DC lighting and energized equipment required to cope with the SBO event. Power uprate does not impact the quantity of emergency DC lighting; however, the RCIC pumps may operate longer due to the increased decay heat, which would result in an increase in the RCIC pump room heat load. In addition, adjacent room temperatures could increase as a result of power uprate.

The calculation shows that, based on an initial RCIC room temperature of 124°F prior to station blackout, the RCIC room temperature reaches 206.4°F at 4 hours, 15 minutes after the transient started. The leakage rate of steam through the gland seal is determined using 50 psig as the backpressure to conservatively maximize the steam leakage rate. The setpoint for the high turbine backpressure trip is 43.7 psig for both Units 1 and 2.

The affected equipment in the RCIC pump room is designed to withstand an ambient temperature of 212 °F for 6 hours. Additionally, the non-metallic components in the RCIC pump are designed to withstand a postulated process fluid temperature of 212 °F. Therefore, the ability of the equipment in the RCIC pump room to function during station blackout at 105% power uprate is not impaired. During a SBO event, loss of HVAC is not an isolation concern for RCIC operation, as the RCIC turbine isolation valves are AC powered and remain open on loss of all AC.

5E: Impact of Changed Parameters on SBO Containment Analysis

5E.1: Suppression Pool

Power uprate will result in increased heat loads to the suppression pool under SBO conditions (i.e., increased decay heat). In the current evaluation for Emergency Core Cooling System (ECCS) pump Net Positive Suction Head (NPSH) for SBO, there is a small margin at the time of peak pool temperature (i.e., the time at which the Residual Heat Removal (RHR) pumps are started on restoration of AC power). To reduce peak calculated pool temperatures under uprate, station emergency operating procedures will be revised to limit Reactor Pressure Vessel (RPV) cooldown to 20 °F/hr maximum, while under SBO conditions. This restriction is similar to the guidance for Appendix R fire events wherein no cooldown is permitted until suppression pool cooling is established. It is proposed to allow some cooldown under SBO provides the operators with some leeway in responding to the SBO event.

By limiting the RPV cooldown to 20 °F/hr, the suppression pool heatup is reduced from the current analytical value and the existing NPSH margin is maintained. For cooldown using RCIC pump injection the peak pool temperature is 196 °F. For the case using HPCS pump injection the peak temperature is 201 °F.

By maintaining the sensible heat energy in the RPV and connected piping, the drywell will see increased heat loads during the SBO portion of the transient as discussed below.

5F.2: Non-Metallic Pump Components

The current SBO coping analysis evaluated HPCS and RCIC non-metallic pump components to verify that they could withstand postulated fluid temperatures. The results of this analysis document that the RCIC and HPCS non-metallic components can withstand a maximum of 221 °F and 300 °F respectively. Therefore, following power uprate, the non-metallic components can withstand the final predicted suppression pool temperatures at a 20 °F/hr RPV depressurization cooldown rate.

5G: Impact of Changed Parameters on SBO Containment Isolation Analyses

Power uprate does not affect any of the parameters associated with the containment isolation valves required in response to a SBO event, nor does it affect the ability to position the required valves (with indication). Therefore, power uprate has no impact on the SBO Containment Isolation Analysis.

Response 5: Conclusion

The primary effect of power uprate on the SBO coping analysis is the influence that the increase in decay heat has on final suppression pool and drywell temperatures. However, an Engineering Evaluation has documented that an optimal RPV depressurization cooldown rate (≤20 °F/hr) can be selected, which will accommodate the increase in decay heat to enable Units 1 and 2 to withstand and recover from a station blackout as required by 10 CFR 50.63, "Loss of All Alternating Current Power." The optimal RPV depressurization cooldown rate is being incorporated into station procedures and the UFSAR.

Question 6:

Section 10.3.1.1 of NEDC-332701P states that the current accident and normal plant conditions for temperature, pressure and humidity inside the primary containment are "nearly unchanged" for the power uprate conditions. Please provide a detailed discussion to clearly explain how the current accident and normal temperature, pressure, and humidity profiles for inside the primary containment change for the power uprate conditions and why these changes have no impact on the environmental qualification of electrical equipment. In addition, please provide a similar discussion for the temperature, pressure, and humidity profiles for high energy line break areas outside of the primary containment.

Response 6:

6A: Inside Primary Containment

The normal operating pressure condition in the primary containment does not change for power uprate. The drywell operating pressure is controlled between -0.5 and 0.75 psig during power operation. The drywell heat load is increased by approximately 0.1%, thus the area temperature increase in the drywell is negligible. The two factors that affect relative humidity under normal operating conditions are temperature and leakage. Since the normal operating temperature increase in the drywell is negligible with power uprate and leakage into the drywell is not affected, it is concluded that drywell humidity remains within the band (40-55%) identified in UFSAR Table 3.11-13, "Harsh Environment Zone H2 – Service Conditions Inside the Drywell."

Following an accident, relative humidity increases to 100% for the pre-uprate condition (UFSAR Table 3.11-4, "Harsh Environment Zone H2 – Bounding Environmental Conditions Inside the Drywell".) Since this is the maximum value for relative humidity, there is no change for power uprate.

Peak primary containment pressures and pool temperatures increase during an accident following power uprate. The following Table 6A-1 provides a summary of the pre-uprate and post-uprate post Loss of Coolant Accident (LOCA) primary containment pressures and pool temperatures. All of the post-uprate temperatures and pressures are less than the design limits.

TABLE 6A-1: KEY PARAMETER COMPARISON

Parameter	Current Value (UFSAR)	Pre-Power Uprate Value	Post-Power Uprate Value	Design Limit
Peak Drywell Pressure [psig]	39.6	39.3	39.9	45
Peak Drywell-to-Wetwell Pressure Difference [psid]	24.2	24.6	22.4 [1]	25
Peak Wetwell Pressure [psig]	30.6	28.0	27.9	45
Long-term Peak Suppression Pool Temperature [°F]				
Design Basis Accident (DBA) LOCA	200	190	193	212
Alternate Shutdown	-	-	207	212
NUREG-0783	187	-	188	208

Although temperatures and pressures increase post-LOCA, the uprate post-LOCA temperatures and pressures are less than the electrical equipment qualification temperatures and pressures for safety related equipment located in the primary containment.

Regarding the maximum containment temperature, the drywell design temperature of 340°F documented in Section 6.2.1.1.3.1.4, "Accident Response Analysis-Small Size Breaks," of the UFSAR is based on the combination of primary system pressure and containment pressure that produces the maximum possible superheat temperature. The calculation assumes a reactor leak consisting of saturated steam only, with isenthalpic expansion to the maximum drywell pressure limit. Because saturated steam has a higher enthalpy than saturated liquid, and because steam with the maximum enthalpy is assumed (at approximately 460 psia), this drywell design temperature limit bounds all analyses within the drywell pressure limit, regardless of the initial dome pressure or initial reactor power.

[1] The value shown for the peak drywell-to-wetwell pressure difference for the pre-uprate power was obtained using the M3CPT code. As discussed in Section 4.1.1.3 of the Power Uprate SAR (NEDC-32701P), the M3CPT calculated value for this parameter is overly conservative in that the calculation does not consider compression of the wetwell airspace during pool swell. As stated in Section 4.1.1.3 of the Power Uprate SAR, a new analysis was being performed. The new analysis used the GE PICSM code, which accounts for wetwell airspace compression during pool swell. The peak drywell-to-wetwell pressure difference calculated with the new analysis is 22.4 psid, which is bounded by the design limit of 25.0 psid.

A small reactor leak consisting of only steam imposes the most severe temperature conditions on the drywell structures and safety related equipment in the drywell. For large steam line breaks, the superheat temperature is nearly the same as for small breaks, but the duration of the high temperature condition is shorter due to the rapid depressurization of the reactor. However, because the drywell design pressure limit is not exceeded in any of these cases, the resulting drywell temperatures are bounded by the drywell design temperature limit.

6B: Outside Primary Containment

LaSalle County Station Units 1 and 2 are designed to withstand the effects of postulated pipe breaks and leakage cracks, including pipe whip, jet impingement, and reaction forces, for power uprate to 105%. The design bases for pipe whip restraints, equipment shields, interior flood control, High Energy Line Break (HELB) pressurization and environmental analyses have sufficient margin to accommodate changes to system parameters due to power uprate. The increase in the blowdown rate is insignificant and the resulting profiles are bounded by the existing profiles due to conservatism in the original analyses, as discussed in 6B.3 below for each break. The evaluation shows that the systems and components required to mitigate the postulated HELB events are designed to withstand the resulting pressure and thermal loading following a high energy line break.

Calculations supporting the dispositions of potential targets of pipe whip have been evaluated and determined to be adequate for the systems and components required to mitigate the postulated HELB events at the uprated power conditions. Existing pipe whip restraints and jet impingement shields, and their supporting structures, are also adequate for the uprated conditions.

Based upon the analysis performed for power uprate, the mass and energy releases due to pipe breaks outside primary containment due to power uprate are bounded by the original analysis. Because the mass and energy releases are bounded, there is no increase in the environmental parameters that would impact equipment operability. Thus, all equipment remains qualified.

6B.1: Subcompartment Pressurization

The impact of 105% power uprate on subcompartment pressurization due to HELB is evaluated for each individual system as discussed below.

6B.2: Environmental Effects

A rupture in high-energy piping (circumferential break or longitudinal break) will release fluid into a building region and could, over a period of time, affect the environmental conditions of required systems and components. Therefore, for each postulated rupture, the effect of environmental changes on required systems and components was evaluated. The impact on environmental effects was evaluated for each individual system as discussed below.

6B.3: System Evaluations

Main Steam (MS)

The MS piping is postulated to break in the main steam tunnel. This main steam line break will also cause the rupture of one feedwater line. The MS pressure upstream of the turbine throttle valve at 105% rated power will be reduced. Thus the current MS HELB pressurization and environmental analyses are bounding.

Feedwater

The mass and energy release for a main steam line plus feedwater line break following power uprate is bounded by the mass and energy release calculated pre-power uprate. Following power uprate the feedwater temperature will be 6.5 °F higher than current licensed conditions, and the main steam stagnation enthalpy will not change for uprate. The postulated accident is that of the main steam line breaking, and whipping into a feedwater line, thus causing it to break. For this scenario, the main steam line mass and energy release will remain unchanged following uprate. This is due to the fact that the reactor dome pressure is unchanged, and the stagnation enthalpy in the main steam line is unchanged. However, the mass and energy release from the feedwater line break will be larger for the conditions at uprate compared to current licensed power conditions. The mass and energy release calculated pre uprate is conservative, and bounds the mass and energy release at uprated conditions. This was confirmed by a detailed model of the feedwater piping and demonstrating with RELAP4/MOD5 that the feedwater piping mass and energy release is conservative.

Reactor Core Isolation Cooling (RCIC)

RCIC normal operating system pressure and temperature are not impacted as a result of power uprate; therefore, RCIC system HELB pressurization and environmental analyses are bounding for power uprate.

Reactor Water Cleanup (RWCU)

The slight decrease in RWCU temperature as a result of uprate does not impact the limiting temperature for RWCU mass and energy release following a postulated HELB. The HELB design basis uses minimum RWCU System temperature, which does not change with uprate.

RWCU mass and energy release does not change due to the increase in feedwater system pressure since it is based on reactor dome pressure plus static head, which does not change with uprate. Further reverse flow in the RWCU break from the FW system is isolated by a check valve. Therefore, power uprate does not impact RWCU HELB.

Reactor Recirculation (RR)

RR normal operating system pressure and temperature have minor reductions in pressure and temperature (<1%) as a result of power uprate; therefore, RR system LOCA analysis and HELB environmental analysis are bounding for power uprate.

Residual Heat Removal (RHR)

RHR normal operating system pressure and temperature do not change as a result of power uprate; therefore, RHR system HELB pressurization and environmental analyses are bounding for power uprate.

High Pressure Core Spray (HPCS) and Low Pressure Core Spray (LPCS)

HPCS and LPCS systems normal operating pressures and temperatures do not change as a result of power uprate; therefore, HPCS and LPCS systems HELB pressurization and environmental analyses are bounding for power uprate.

Condensate Booster (CB)

The Condensate Booster System is a non-safety-related system located outside containment. Due to the fact that the condensate booster system fluid is a subcooled liquid, the results of the mass and energy release will not impact the parameters listed in the UFSAR Section 3.11, Tables 3.11 – 9 "Harsh Enviroment Zone H7, Bounding Environmental Conditions for the Turbine Building," and 3.11 – 10, "Harsh Environment Zone H8, Bounding Environmental Conditions for the Turbine Building." The operating pressure decreases as a result of larger pressure drops from the increase in condensate flow, thus the current CB HELB pressurization analysis, based on operating pressure, is bounding for power uprate.

Control Rod Drive (CRD)

The Control Rod Drive System normal operating system pressure and temperature do not change as a result of power uprate, therefore; CRD system HELB pressurization and environmental analyses are bounding.

Standby Liquid Control System (SBLC)

The Standby Liquid Control System parameters are not impacted by power uprate. Therefore the previous HELB analysis is bounding for the uprated core condition.

Question 7:

In Sections 10.3.1.1 and 10.3.1.2 of NEDC-32701P, it is noted that the environmental qualification radiation levels under accident conditions are conservatively evaluated to increase 16 percent inside and outside the primary containment. It is also noted that these increases do not impact the bounding environmental conditions currently in the updated final safety analysis report. Please discuss in detail the current, the revised, and the bounding radiation level conditions and provide numerical values for these radiation level conditions.

Response 7:

The current zone bounding radiation levels for Environmental Qualification (EQ) are identified in UFSAR Section 3.11, "Environmental Design of Mechanical and Electrical Equipment." The component unique qualification levels and supporting calculations for both the zone integrated dose levels and the component unique level are identified in the component EQ binders as applicable. The tabulation of values for each area/component for both the current and power uprate condition is provided.

The methodology and acceptance criteria for the power uprate evaluation are provided below:

7A: Methodology

To determine the power uprate impact on EQ calculations, doses are determined for specific geometries using the current and the power uprate design basis core inventory sources. Both sources, modified to reflect post-LOCA distribution, are used as input into RACER-PC and ISOSHLD-PC computer codes. RACER-PC takes into account the daughter products of the shutdown sources and the decay of all the isotopes during the specified time period. Based on the RACER-PC time dependent isotope inventory results, ISOSHLD-PC is used to determine the dose rates and the doses as a function of time for the following six geometry configurations.

- A three foot radius water sphere shielded by two feet of concrete.
- A three foot radius water sphere unshielded.
- A three foot radius air sphere shielded by two feet of concrete.
- A three foot radius air sphere unshielded.
- A thirty foot radius water cylinder immersion dose calculation.
- A thirty foot radius air cylinder immersion dose calculation.

Once the results are obtained for both sources, dose ratios and dose rate ratios are determined for the 105% power uprate source to the current licensed thermal power source. The scale factors between the current and uprate sources are determined for five post-accident integration times (i.e., 1 hour, 1 day, 1 week, 1 month, and 1 year). Because current EQ Zone dose analyses are determined at one-year post-LOCA, only the ratios for 365 days are used for determining the power uprate impact on meeting the current dose acceptance criteria. Harsh Zone applications of the dose scaling factor were limited to two models; i.e., a shield water source for all zones except the family of H4 subzones and an unshielded air source for the family of H4 subzones.

The dose ratios (scaling factors) were determined using the source term data provided by GE at the 3908 MWt power level and the current licensed source terms. 3908 MWt is 1.10 times 3552 MWt. Therefore, the dose ratios (scaling factors) of this calculation inherently include the 10% dose margin required by IEEE 323-1974, "IEEE Standard for Qualifying Class 1E Equipment for Nuclear Power Stations," and can be used for power-levels up to 3552 MWt. This conservatively bounds the 3489 MWt power level for 105% power uprate. The source term data provided by GE account for the impact of hydrogen addition and 24-month fuel cycles.

As stated in the License Amendment Request Attachment E, SAR sections 10.3.1, "Main Steam Supply System, Design Basis," a 16% increase represents the largest increase possible regardless of plant configuration and barriers to radiological transport from the containment. A 10% increase is applied to zones H4A though H4H based on a more realistic evaluation of the Standby Gas Treatment System (SBGTS) and surrounding areas. The 16% and 10% increases are determined from dose ratios obtained from the RACER-PC and ISOSHLD-PC computer code results using the current and power uprate sources.

With the ratios known, the final step in the analysis reviews current EQ calculations and determines if the available margin in the calculations can absorb the increase in the post accident dose. For each calculation, the post accident dose is increased by a dose scaling factor to account for the effect of power uprate. The normal operation dose rate outside the primary containment is the same for both the current licensed power and the 105% power uprate. It was determined that the existing normal operation design basis source terms bound the power uprate conditions. As stated in the License Amendment Request Attachment E, SAR Sections 10.3.1 the sum of the normal and adjusted accident dose, which includes the IEEE required margin of 10%, was determined to be bounded by the current dose acceptance criteria for each area/component.

7B: Acceptance Criteria

The EQ calculation utilizes two types of acceptance criteria that were established by the current design basis. The most encompassing criteria are the ones that apply to EQ Zones. The EQ Zones are set up using temperature, pressure, humidity and radiation maximums which were determined by selecting calculated values that occur during a 40 year normal operating life and following the most severe postulated Design Basis Accident (usually the DBA-LOCA). At this time, there are 16 zones and 12 subzones. The second type of acceptance criteria is equipment specific total EQ doses, which were determined by equipment testing that used the appropriate values for each parameter (i.e., the harshest radiation that would be experienced by the equipment type). In some cases, the testing determined that the equipment could not be qualified for the zone's dose (or dose rate) criterion. The testing established a new radiation acceptance criterion for that type (and brand) of radiation sensitive equipment. This type of equipment is evaluated individually or in groups that have the same dose acceptance criteria. The equipment specific acceptance criterion is met by a detailed location specific analysis, by specifying a maximum normal operating life expectancy, by determining the equipment's post-accident operating time requirements, by using equipment specific radiation shielding, or by a combination of two or more of these acceptable dose reduction methods. All of the relevant equipment locations were then analyzed. Applicable conservatisms were applied as required, in accordance with IEEE 323-1974.

7C: EQ Dose Summary, Table 7-1

The information in columns A through F was taken from the existing pre-uprate EQ dose calculations, which are identified in column A. Column C shows the dose acceptance criteria for the zone/component. Column G provides the pre-power uprate margin above the IEEE-323-1974 required margin. Column H provides the power uprate dose factor that was determined as stated in section 7A, Methodology. Column I is the power uprate accident dose ratio (H) times the existing post accident dose (E). Column I therefore provides the new calculated LOCA dose with the 10% IEEE margin included. Column J is the total power uprate dose that is the new post-accident dose (I) plus the normal dose (D). Column K is the post-power uprate margin above the required IEEE 323-1974 10% margin.

TABLE 7-1: TABULATION OF RESULTS

	A	B	C	D	E	F	G	H	I	J	K
	Reference Calculation	Zone/ Equip.	Specified EQ Dose (Rads)	Calculated Normal Oper. Dose Without Margin (Independ. of Power Level) (Rads)	Calculated Accident Dose at Current Licensed Power Without Margin (Rads)	Calculated Total EQ Dose at Current Licensed Power Including 10% Margin on Accident Dose (Rads)	Present Current Licensed Power Additional Margin (%) Available	Power Uprate Accident Dose Factor (Includes 10% Margin)	Calculated Accident Dose at 105% Power uprate (Includes 10% Margin) (Rads)	Calculated Total EQ Dose at 105% Power Uprate Including 10% Margin on Accident Dose (Rads)	105% Power Uprate Additional Margin (%) Available
1	0-DX-00, R1	H2	2.00E+08	1.60E+07	1.50E+08	1.81E+08	10.5%	1.16	1.74E+08	1.90E+08	5.2%
2	0-DX-00, R1	H3	2.00E+08	1.60E+07	1.50E+08	1.81E+08	10.5%	1.16	1.74E+08	1.90E+08	5.2%
3	0-DX-00, R1	H4A	1.00E+07	1.95E+06	7.17E+06	9.84E+06	1.7%	1.10	7.89E+06	9.84E+06	1.6%
4	0-DX-00, R1	H4B	4.00E+07	7.00E+02	3.19E+07	3.51E+07	13.9%	1.10	3.51E+07	3.51E+07	13.9%
5	0-DX-18, R0	H4C	2.00E+08	7.00E+02	1.50E+08	1.65E+08	21.2%	1.10	1.65E+08	1.65E+08	21.2%
6	0-DX-H4A, R1	H4E-H4G	1.00E+07	7.00E+02	7.17E+06	7.89E+06	26.8%	1.10	7.89E+06	7.89E+06	26.7%
7	0-DX-00, R1; 0-DX-H4A, R1	H4H	1.00E+07	1.95E+06	7.17E+06	9.84E+06	1.7%	1.10	7.89E+06	9.84E+06	1.6%
8	0-DX-00, R1	H5	1.00E+07	5.06E+06	3.93E+06	9.38E+06	6.6%	1.16	4.56E+06	9.62E+06	3.9%
9	0-DX-00, R1	H6	1.00E+07	1.50E+05	3.55E+06	4.06E+06	146.6%	1.16	4.12E+06	4.27E+06	134.3%

10	0-DX-00, R1	H7	1.00E+07	5.06E+06	8.24E+03	5.07E+06	97.3%	1.16	9.56E+03	5.07E+06	97.2%
11	0-DX-00, R1	H8	4.00E+07	2.98E+07	8.24E+03	2.98E+07	34.2%	1.16	9.56E+03	2.98E+07	34.1%
12	0-DX-00, R1	H9	1.00E+05	7.44E+02	4.65E+04	5.19E+04	92.7%	1.16	5.39E+04	5.47E+04	82.8%
13	0-DX-00, R1	C1	1.00E+03	1.49E+02	3.29E+02	5.11E+02	95.7%	1.16	3.82E+02	5.31E+02	88.4%
14	0-DX-00, R1	C2	1.00E+04	2.98E+02	3.29E+02	6.60E+02	1415.4%	1.16	3.82E+02	6.80E+02	1371.3%
15	0-DX-00, R1	C3	1.00E+04	2.98E+02	4.83E+03	5.61E+03	78.2%	1.16	5.60E+03	5.90E+03	69.4%
16	0-DX-00, R1	N1	1.00E+04	4.38E+03	3.29E+02	4.74E+03	110.9%	1.16	3.82E+02	4.76E+03	110.0%
17	0-DX-00, R1	N2	1.00E+04	4.46E+03	3.29E+02	4.82E+03	107.4%	1.16	3.82E+02	4.84E+03	106.5%
18	0-DX-18-E, R0 (Note 1)	Phase sep. pipe	2.00E+06	1.95E+06	N/A	N/A	2.6%	N/A	N/A	1.95E+06	2.6%
19	0-DX-18-G, R0 (Note 1)	Chem waste tanks	N/A	9.98E+05	N/A	N/A	N/A	N/A	N/A	N/A	N/A
20	0-DX-C1, R2	C1	1.00E+03	1.75E+02	3.29E+02	5.37E+02	86.3%	1.16	3.82E+02	5.57E+02	79.6%
21	0-DX-C2, R2	C2	1.00E+03	2.98E+02	3.29E+02	6.60E+02	51.5%	1.16	3.82E+02	6.80E+02	47.1%
22	0-DX-C3, R2	C3	1.00E+03	2.98E+02	3.70E+02	7.05E+02	41.8%	1.16	4.29E+02	7.27E+02	37.5%
23	0-DX-H2, R2 0-DX-18	H2 coatings depth dose	1.00E+09	1.60E+07	6.33E+08	7.12E+08	40.4%	1.16	7.34E+08	7.50E+08	33.2%
24	0-DX-H2, R2 0-DX-18	H2 coatings	1.00E+09	1.60E+07	6.37E+08	7.17E+08	39.5%	1.16	7.39E+08	7.55E+08	32.4%
25	0-DX-H2, R2 0-DX-18	H3 Wetwell Coatings	1.00E+09	N/A	6.60E+08	7.26E+08	37.7%	1.16	7.66E+08	7.66E+08	30.6%

26	0-DX-H2B, R0	H2B	1.30E+08	1.60E+07	8.86E+07	1.13E+08	14.6%	1.16	1.03E+08	1.19E+08	9.4%
27	0-DX-H4A, R1	H4A	1.00E+07	1.95E+06	7.17E+06	9.84E+06	1.7%	1.10	7.89E+06	9.84E+06	1.6%
28	0-DX-H4B, R1	H4B	4.00E+07	1.95E+06	3.19E+07	3.70E+07	8.0%	1.10	3.51E+07	3.70E+07	7.9%
29	0-DX-H5, R1	H5	1.00E+07	5.06E+06	3.93E+06	9.38E+06	6.6%	1.16	4.56E+06	9.62E+06	3.9%
30	0-DX-H6, R1	H6	1.00E+07	1.50E+05	3.55E+06	4.06E+06	146.6%	1.16	4.12E+06	4.27E+06	134.3%
31	0-DX-H7,R1	H7	1.00E+07	5.06E+06	8.24E+03	5.07E+06	97.3%	1.16	9.56E+03	5.07E+06	97.2%
32	0-DX-H8, R1	H8	4.00E+07	2.98E+07	8.24E+03	2.98E+07	34.2%	1.16	9.56E+03	2.98E+07	34.1%
33	0-DX-H9, R1	H9	1.00E+05	7.44E+02	4.65E+04	5.19E+04	92.7%	1.16	5.39E+04	5.47E+04	82.8%
34	0-DX-N1, R2	N1	1.00E+04	4.38E+03	3.29E+02	4.74E+03	110.9%	1.16	3.82E+02	4.76E+03	110.0%
35	0-DX-N2, R2	N2	1.00E+04	5.25E+03	3.29E+02	5.61E+03	78.2%	1.16	3.82E+02	5.63E+03	77.5%
36	0-MS-03, R0	flow transmitter	1.00E+05	3.50E+02	6.86	3.58E+02	27868.4%	1.16	7.96E-00	3.58E+02	27836.2%
37	1-EQ-05, R0 Zone H4A	MCC 1AP75E	9.70E+05	3.50E+02	8.07E+05	8.88E+05	9.2%	1.10	8.88E+05	8.88E+05	9.2%
38	1-EQ-05, R0 Zone H4A	MCC 2AP75E	3.80E+06	3.50E+02	3.16E+06	3.48E+06	9.3%	1.10	3.48E+06	3.48E+06	9.3%
39	1-EQ-05, R0 Zone H4A	MCC 1&2AP83 E	8.70E+05	3.50E+02	7.22E+05	7.95E+05	9.5%	1.10	7.94E+05	7.95E+05	9.4%
40	1-EQ-05, R0 Zone H4A	MCC 1&2AP76 E	1.20E+06	3.50E+02	9.70E+05	1.07E+06	12.4%	1.10	1.07E+06	1.07E+06	12.4%
41	1-EQ-05, R0 Zone H4A	MCC 1&2AP82 E	1.30E+06	3.50E+02	1.12E+06	1.23E+06	5.5%	1.10	1.23E+06	1.23E+06	5.4%

42	2-EQ-01, R0 (Note 2)	valve seals 1&2B21-F010A&B	(See Note 2)	2.407E+06	1.925E+07	2.36E+07	(See Note 2)	1.16	2.233E+07	2.47E+07	(See Note 2)
43	2-EQ-02, R0	H4A, MCC 1&2AP78 E	7.60E+06	3.50E+02	6.31E+06	6.94E+06	9.5%	1.10	6.94E+06	6.94E+06	9.4%
44	3-EQ-01, R1	H4B, panel 1PL17J	1.00E+07	1.95E+06	6.01E+06	8.56E+06	16.8%	1.10	6.61E+06	8.56E+06	16.8%
45	3-EQ-01, R1	switch 1TC-VG029/03 0	1.00E+07	1.95E+06	5.57E+06	8.08E+06	23.8%	1.10	6.13E+06	8.08E+06	23.8%
46	3-EQ-02, R0 max. dose rate in aux bldg	Monitor + samp. Panel (Note 3)	0.100 R/hr	N/A	0.0792 R/hr	N/A	26.2%	1.23 (Note 3)	0.0972 R/hr	N/A	2.90%
47	3-EQ-03, R0	Agastat relays in H4A	2.00E+05	3.50E+02	1.44E+05	1.59E+05	26.0%	1.10	1.58E+05	1.59E+05	25.9%
48	3-EQ-H9, R0	Specific for H9	4.00E+04	7.44E+02	6.68E+03	8.09E+03	394.3%	1.16	7.75E+03	8.49E+03	370.9%
49	4-EQ-01, R2 (H4A) (dose rate)	1&2H22P-004, 005, 026, & 027	1.00E+06	7.00E+02	1.61E+04	1.85E+04	5318.9%	1.10	1.78E+04	1.85E+04	5318.8%
50	4-EQ-02, R0	H4A, MCC 1&2AP71 E	8.69E+05	3.50E+02	7.24E+05	7.97E+05	9.1%	1.10	7.96E+05	7.97E+05	9.0%
51	5-EQ-01, R1	H4A, PT-CM 032, 055, & 056	1.00E+06	9.00E+02	4.03E+05	4.44E+05	125.1%	1.10	4.43E+05	4.44E+05	125.1%
52	5-EQ-H2, R0	MS-SRV solenoids	3.00E+07	4.00E+06 (Over 10 Years)	1.827E+07	2.41E+07	24.5%	1.16	2.119E+07	2.52E+07	19.0%
53	6-EQ-01, R0 (Zone H4A)	B33-N014A B33-N024A	5.00E+06	1.95E+06	2.12E+06	4.28E+06	16.8%	1.10	2.33E+06	4.28E+06	16.7%

54	6-EQ-01, R0 (Zone H4A)	C34-N017	5.00E+06	1.95E+06	1.70E+06	3.82E+06	30.9%	1.10	1.87E+06	3.82E+06	30.8%
55	6-EQ-01, R0 (L-000550, R0 H5A)	E21-N008	5.00E+06	2.420E+04	3.55E+06	3.93E+06	27.3%	1.16	4.118E+06	4.14E+06	20.7%
56	6-EQ-01, R0 H6	E22-N005	5.00E+06	1.50E+05	1.74E+06	2.06E+06	142.2%	1.16	2.018E+06	2.17E+06	130.5%
57	6-EQ-01, R0 (L-000551, R0 H5E)	E32-N055	5.00E+06	4.33E+04	3.55E+06	3.95E+06	26.6%	1.16	4.118E+06	4.16E+06	20.1%
58	6-EQ-01, R0 (Zone H4A)	E31-N503 B33-N014D B33-N024D	5.00E+06	1.95E+06	9.89E+05	3.04E+06	64.6%	1.10	1.09E+06	3.04E+06	64.5%
59	6-EQ-01, R0 (Zone H4A)	B33-N014B B33-N024B	5.00E+06	1.95E+06	2.295E+06	4.47E+06	11.7%	1.10	2.52E+06	4.47E+06	11.7%
60	6-EQ-01, R0 (Zone H4A)	B33-N014C B33-N024C	5.00E+06	1.95E+06	7.79E+05	2.81E+06	78.1%	1.10	8.57E+05	2.81E+06	78.1%
61	6-EQ-H5A, R1	H5A	1.00E+06	4.10E+04	6.11E+05	7.13E+05	40.2%	1.16	7.09E+05	7.50E+05	33.3%
62	6-EQ-H5B, R0 (Note 1)	H5B pipe tunnels	5.00E+05	4.00E+05	N/A	N/A	25.0%	1.16	N/A	4.00E+05	25.0%
63	6-MS-01, R0	steamline radiation monitors	7.00E+06	6.00E+06	1.18E+05	6.13E+06	14.2%	1.16	1.37E+05	6.14E+06	14.0%
64	6-MS-02, R0	MSIV solenoids	2.00E+07	2.40E+06	1.38E+07	1.76E+07	13.8%	1.16	1.60E+07	1.84E+07	8.6%
65	7-EQ-01, R1	El. 694'-6" floor	5.50E+06	3.50E+04	4.54E+06	5.03E+06	9.4%	1.16	5.27E+06	5.30E+06	3.7%

66	7-EQ-01, R1	LT-CM030, 032, & 062	5.00E+06	3.50E+04	3.34E+06	3.71E+06	34.8%	1.16	3.87E+06	3.91E+06	27.8%
67	8-EQ-01, R0	H6, ECCS motors	1.00E+07	1.60E+04	4.20E+06	4.64E+06	115.7%	1.16	4.87E+06	4.89E+06	104.5%
68	ATD-0195, R0	C2 & C3: ABB 27N relays	2.20E+03	2.98E+02	1.15E+03	1.56E+03	40.8%	1.16	1.33E+03	1.63E+03	34.8%
69	L-000517, R0	H5B	1.00E+07	5.79E+04	3.55E+06	3.96E+06	152.3%	1.16	4.12E+06	4.18E+06	139.4%
70	L-000518, R0	H5C	4.00E+07	1.93E+07	3.94E+06	2.36E+07	69.2%	1.16	4.57E+06	2.39E+07	67.5%
71	L-000519, R0	H5D	1.00E+07	8.05E+05	3.94E+06	5.14E+06	94.6%	1.16	4.57E+06	5.38E+06	86.0%
72	L-000550, R0	H5A	1.00E+07	2.42E+04	3.55E+06	3.93E+06	154.5%	1.16	4.12E+06	4.14E+06	141.4%
73	L-000551, R0	H5E	1.00E+07	4.33E+04	3.55E+06	3.95E+06	153.3%	1.16	4.12E+06	4.16E+06	140.3%
74	L-000552, R0	H7	1.00E+07	2.27E+06	8.24E+03	2.28E+06	338.8%	1.16	9.56E+03	2.28E+06	338.6%
75	L-000559, R0	N3	1.00E+04	7.45E+02	4.83E+03	6.06E+03	65.1%	1.16	5.60E+03	6.35E+03	57.5%
76	L-001737, R0	H10, lower vent room	1.00E+04	4.46E+03	3.38E+02	4.83E+03	107.0%	1.16	3.92E+02	4.85E+03	106.0%
77	L-001737, R0	H10, upper vent room	1.00E+04	4.46E+03	3.34E+02	4.83E+03	107.2%	1.16	3.87E+02	4.85E+03	106.2%
78	L-001997, R0	TT-VG007 TT-VG012	1.00E+07	3.50E+02	5.40E+06	5.94E+06	68.3%	1.10	5.94E+06	5.94E+06	68.3%
79	L-000897 (Note 4)	24 Month Cycle	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

NOTES:

1 Normal dose only (Rows 18, 19, 62)

2 The organic seal rings in the valve assembly have been removed. There is no radiological impact for the installed metallic seal rings. (Row 42)

3 This is a dose rate calculation for performing post-LOCA work tasks in the Auxiliary Building following a postulated design basis accident. The first hour post-LOCA dose rate factor is 1.23. (Row 46)

4 The GE source term data, which is utilized in this tabulation, is based both on the 105% power uprate and 24-month fuel cycles. Therefore, after power uprate, the EQ dose value in L-00897 will no longer govern. (Row 79)