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A. Edward Scherer
Manager of
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October 27, 2005

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

SUBJECT: **San Onofre Nuclear Generating Station, Units 2 and 3
Docket Nos. 50-361 and 50-362
Replacement Pages for Proposed Change Number
(PCN) 555 Alternative Source Term**

References: 1) Letter from D. E. Nunn (SCE) to Document Control Desk (NRC), dated December 27, 2004, Subject: "San Onofre Nuclear Generating Station, Units 2 and 3, Docket Nos. 50-361 and 50-362, Proposed Change Number (PCN) 555, Alternative Source Term"

2) Letter from Bo M. Pham (NRC) to Harold B. Ray (SCE), dated December 23, 2004, Subject: "San Onofre Nuclear Generating Station, Units 2 and 3, Issuance of Amendments on Equipment Hatch Open During Refuel Operations (TAC Nos. MC0317 and MC0318)

Dear Sir or Madam:

This letter provides replacement pages to correct errors in Southern California Edison's (SCE's) letter dated December 27, 2004 (Reference 1). Reference 1 consisted of License Amendment Applications 231 and 215 for San Onofre Units 2 and 3, respectively. These License Amendment Applications (designated as PCN-555) requested a change to the Units 2 and 3 accident source term used in the design basis radiological consequences analyses in accordance with the requirements of 10CFR50.67.

PCN-555 was supported by re-analysis of several design basis accidents. The meteorological data used in support of PCN-555 had previously been submitted to the Nuclear Regulatory Commission (NRC) in support of a separate License Amendment Application (PCN-534). On December 23, 2004, the NRC issued License Amendments in response to PCN-534 (Reference 2). The associated Safety Evaluation Report noted that "Wind speed, wind direction, and stability class frequency distributions were reasonably similar from year to year, with the exception that the average lower and upper level wind speeds in 1999 were approximately 1.8 times higher than the lower

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and upper level wind speeds averaged over the remaining 9-year period (1993-1998 and 2000-2002). This discrepancy in wind speed values does not have a significant impact on the conclusion of this analysis..."

Upon further investigation, SCE has determined that the wind speed data for 1999 as submitted in support of PCN-534 was in error. As this same data was used in support of PCN-555, SCE has revised the accident analyses that were performed in support of PCN-555 to reflect the correct meteorological data. This has affected the ARCON 96 analysis to determine χ/Q values and, in turn, the dose consequences of the accident analyses. Therefore, this letter provides replacement pages to reflect the revised analyses.

In addition, the replacement pages correct an editorial error to Table 4.1-6 of PCN-555.

Enclosure 1 contains replacement pages for PCN-555 with redline and strikeout markings to show the changes from the original submittal. Enclosure 2 contains replacement pages with the redline and strikeout markings removed.

The accident analysis dose consequences are in some cases slightly increased; however, SCE has determined that the conclusions of the original No Significant Hazards Consideration provided in PCN-555 are unchanged.

The error in the wind speed data has been entered into the SCE corrective action system.

If you have any questions or require additional information, please contact Jack Rainsberry at (949) 368-7420.

Sincerely,

Enclosures:

cc: B. S. Mallett, Regional Administrator, NRC Region IV
J. N. Donohew, NRC Project Manager, San Onofre Units 2 and 3
C. C. Osterholtz, NRC Senior Resident Inspector, San Onofre Units 2 and 3

Enclosure 1

Replacement pages for

PCN-555, "Alternative Source Term"

Redline and Strikeout

of 335 or 500 times greater than the release rate corresponding to the iodine concentration at the equilibrium value of 1.0 µCi/gram DE I-131 specified in the Technical Specifications. The calculation of the concurrent iodine spike release rate conservatively assumed maximum letdown flow, maximum allowable identified and unidentified primary coolant leak rates, maximum allowable primary-to-secondary leak rate, maximum reactor coolant pump seal controlled bleed-off flow rate, 100 percent removal of all iodine from the letdown stream by the purification ion exchanger, and minimum reactor coolant system mass. Table 4.1-6 summarizes the concurrent iodine spike release rate in terms of escape rate coefficients that are to be modeled with the AST reactor core iodine inventory and an assumed 0.62 percent failed fuel. As an example, when the iodine spike release rate for the equilibrium case of 1.3E-08 sec^{-1} is modeled with the AST reactor core iodine inventory and 0.62 percent fuel failure, the resultant equilibrium primary coolant iodine activity concentration is 1.0 µCi/gram DE I-131.

TABLE 4.1-6: CONCURRENT IODINE SPIKE ESCAPE RATE COEFFICIENTS

Condition	Iodine Escape Rate Coefficient [1/second]	Iodine Escape Rate Coefficient [1/hour]
Equilibrium (no spike)	1.3E-08	4.7E-05
Spiking Factor of ~~335~~500	6.5E-06	2.4E-02
Spiking Factor of ~~500~~335	4.4E-06	1.6E-02

Section 4.1.3 Radial Peaking Factor

Consistent with the guidance of RG 1.183 Regulatory Position 3.1, to account for differences in power level across the core, Radial Peaking Factors (RPFs) are applied to the Section 4.1.1 Tables 4.1-3 and 4.1-4 average fuel rod isotope inventory in determining the activity inventory of the damaged fuel rods when only a portion of the core is damaged.

Per RG 1.183 Regulatory Position 3.1, the RPFs should be values from the facility's Core Operating Limits Report (COLR) or Technical Specifications. SONGS Units 2 and 3 do not report RPFs in the facility's COLR or in the SONGS Technical Specifications. SONGS Units 2 and 3 calculate RPFs in unit and cycle specific reload physics analyses.

A review of the recent SONGS Units 2 and 3 Cycle 11 and 12 reload physics analyses identified RPFs with values no greater than 1.67 at 100 percent power. For conservatism the non-LOCA AST dose calculations addressed in this AST license amendment request model an RPF of 1.75 for all damaged fuel rods. For the DBA LOCA, all fuel assemblies are damaged and the core average inventory (without peaking factor) is used.

Parameter	Acceptable Input	Comments
		Steam from a steam line break outside containment (SLB-OC) is assumed to be released via the blowout panels mounted on the roof of the respective Main Steam Isolation Valve (MSIV)/Main Feedwater Isolation Valve (MFIV) enclosure directly above the main steam line. The χ/Qs for an MSSV release credit plume rise due to jet effects in accordance with section 6.0 of RG 1.194.
Building Area, meters^2	Use the actual building vertical cross-sectional area perpendicular to the wind direction. Use default of 2000 m^2 if the area is not readily available. Do not enter zero. Use 0.01 m^2 if a zero entry is desired. Note: This building area is for the building(s) that has the largest impact on the building wake within the wind direction window. This is usually, but need not always be, the reactor containment. With regard to the diffuse area source option, the building area entered here may be different from that used to establish the diffuse source.	The cross-sectional area of the containment is used for all release points except for the Fuel Handling Building (FHB). For the FHB release, the FHB east cross-section area and one half of the containment cross-section area are~~is~~ used. Only one half of the containment is conservatively considered since it is partially offset from the release to intake axis. All other intervening buildings, such as the auxiliary building, are conservatively ignored.
Vertical Velocity, meters/seconds	Note: the vent release model should not be used for DBA accident calculations. For stack release calculations only, use the actual vertical velocity if the licensee can demonstrate with reasonable assurance that the value will be maintained during the course of the accident (e.g., addressed by technical specifications), otherwise, enter zero. If the vertical velocity is set to zero, ARCON96 will reduce the stack height by 6 times the stack radius for all wind speeds. If this reduction is not desired, the stack radius should also be set to zero.	The vent release model is not used for DBA accident calculations. For all vent stack releases, the vertical velocity is set to zero.

Parameter	Acceptable Input	Comments
Direction to Source, degrees	Use the direction FROM the intake back TO the release point. (Wind directions are reported as the direction from which the wind is blowing. Thus, if the direction from the intake to the release point is north, a north wind will carry the plume from the release point to the intake.) Note: some facilities have a "plant north" shown on site arrangement drawings that is different from "true north." The direction entered must have the same point of reference as the wind directions reported in the meteorological data. For ground level releases, if the plume is assumed to flow around a building rather than over it, the direction may need to be modified to account for the redirected flow. In this case, the χ/Q should be calculated assuming flow around and flow over (through) the building and the higher of the two χ/Q s should be used.	SONGS' ~~met.~~ meteorological data ~~is~~ are given relative to true north. SONGS' site arrangement drawings do have a "Plant North" designation that is 57 degrees west of "true north;" consequently, source-to-receptor directions entered into the ARCON96 code are corrected to model true north as the point of reference. For the scenario of an equipment hatch release, the χ/Q is calculated assuming flow both around and over (through) the containment building, and the higher of the χ/Q values is used.
Surface Roughness Length, meters	Use a value of 0.2 in lieu of the default value of 0.1 for most sites. (Reasonable values range from 0.1 for sites with low surface vegetation to 0.5 for forest covered sites.)	Used value of 0.2. SONGS is a seaside site with low surface vegetation.
Wind Direction Window, degrees Code Default	Use the default window of 90 degrees (45 degrees on either side of line of sight from the source to the receptor).	Used 90 degrees.
Minimum Wind Speed, meters/second Code Default	Use the default wind speed of 0.5 m/s (regardless of the wind speed units entered earlier), unless there is some indication that the anemometer threshold is greater than 0.6 m/s.	Used the default wind speed of 0.5 m/s. The minimum SONGS site meteorological tower wind speed reported is 0.3 mph, or 0.13 m/s. Thus, the anemometer threshold is less than 0.6 m/s.
Averaging Sector Width Constant Code Default	Although the default value is 4, a value of 4.3 is preferred. (A future revision to ARCON96 will change the default to 4.3)	Used 4.3.
Initial Diffusion Coefficients, meters	These values will normally be set to zero. If the diffuse source option is being used, see Regulatory Position 2.2.4.	For containment releases, a diffuse source is modeled in accordance with Regulatory Guide 1.194, section 3.2.4.4. For the steam line break outside containment, the releases from the MSIV/MFIV enclosure are modeled as an area source in accordance with Regulatory Guide 1.194, section 3.2.4.7.

steam safety valves. RG 1.194 Section 6.0 states that in lieu of mechanistically addressing the amount of buoyant plume rise:

> "...the ground level χ/Q value calculated with ARCON96 (on the basis of the physical height of the release point) may be reduced by a factor of 5. This reduction may be taken only if (1) the release point is uncapped and vertically oriented and (2) the time-dependent vertical velocity exceeds the 95th-percentile wind speed (at the release point height) by a factor of 5."

The MSSVs are uncapped and vertically oriented, thereby satisfying the first criterion required for plume rise credit per RG 1.194, Section 6.0.

Since the MSSV stack exit is at plant elevation 73.4 ft and grade is at plant elevation 30 ft, the height of the stack exit above grade is 43.4 ft, or 13.2 meters. This is reasonably close to the height of the lower meteorological tower wind measurement instrumentation at 10 meters; therefore, the MSSV stack exit velocity is compared with the 95th percentile 10-m wind speed of 5.5~~5.8~~ m/s.

For purposes of calculating the minimum flow velocity at the exit of the MSSV stack, the following conservative assumptions are made:

1. All MSSVs lift at the lowest set pressure of all the valves.
2. The pressure in the MSSV stack is equal to the maximum backpressure.
3. No credit is taken for head loss due to elevation changes or pipe friction.
4. No credit is taken for expansion of the steam through the stack.

The calculated minimum MSSV stack exit velocity is 72 meters/second. This exit velocity exceeds five times the 95th percentile wind speed (i.e., exceeds 5 x ~~5.8~~ 5.5 m/s = ~~29~~ 27.5 m/s); thereby satisfying the second criterion required for plume rise credit per RG 1.194 Section 6.0.

Since both criteria are satisfied, the ground level atmospheric dispersion factors calculated with ARCON96 (on the basis of the physical height of the release point) for MSSV releases are reduced by a factor of 5. The resultant 95th percentile control room atmospheric dispersion factors for the MSSV release path with credit for plume rise are presented in Section 4.4.5.

Section 4.4.4.6 Atmospheric Dump Valve (ADV) Stack Release

Atmospheric dispersion between the ADV and the control room HVAC intakes is modeled as a point source using the ARCON96 ground level release option. Per RG 1.194 Section 6.0 (and as justified in the following text), a reduction factor of 5 may be applied to the ARCON96 results to allow credit for buoyant plume rise in determining the Control Room atmospheric dispersion factors associated with the energetic release from atmospheric dump valves.

The ADVs are uncapped and vertically oriented, thereby satisfying the first criterion required for plume rise credit per RG 1.194 Section 6.0.

Since the ADV stack exit is at plant elevation 113.92 ft and grade is at plant elevation 30 ft, the height of the stack exit above grade is 83.92 ft, or 25.6 meters. Since the ADV stack exit is closer in height to the upper meteorological tower wind measurement instrumentation at 40 meters than to the lower meteorological tower wind measurement instrumentation at 10 meters, the ADV stack exit velocity is compared with the 95th percentile 40-m wind speed of 6.4 ~~6.8~~ m/s.

The accident analyses assume that an ADV is operated manually; therefore, the flow velocity at the ADV stack exit will decrease over time, as the steam generator blows down. Thus, in order to credit plume rise in an ADV release dose analysis, the period for which the ADV stack exit vertical flow velocity exceeds five times the 95th percentile upper level wind speed of ~~6.8~~ 6.4 m/s (i.e., exceeds 5 x ~~6.8~~ 6.4 m/s = ~~34~~ 32 m/s) would need to be determined.

Since the second criterion is not necessarily satisfied for the duration of a dose analysis, the ground level atmospheric dispersion factors calculated with ARCON96 (on the basis of the physical height of the release point) for ADV releases may or may not be reduced by a factor of 5 for the duration of a dose analysis. The resultant 95th percentile control room atmospheric dispersion factors for the ADV release path with and without credit for plume rise are presented in Section 4.4.5. The use of the lower values crediting plume rise will be evaluated on an event-specific basis.

Section 4.4.4.7 Steam Line Break Outside Containment (SLB-OC) Release

Atmospheric dispersion between the steam line break outside containment and the control room HVAC intakes is modeled as an area (diffuse) source using the ARCON96 ground level release option.

The SLB-OC is postulated to occur outboard of the main steam line restraint/anchor downstream of the main steam isolation valve. Thus, the location of the postulated break is in the walkway between the east wall of the Turbine Building and the Main Steam Isolation Valve/Main Feedwater Isolation Valve (MSIV/MFIV) enclosure structures. The enclosure structures are open to the walkway, which is then open to the atmosphere above. Several blowout panels are present on the roofs of the enclosure structures. There are also blowout panels on the walls of the MSIV/MFIV enclosure. The blowout panels open during a large SLB-OC to protect the enclosure structures from overpressurizing. Thus, depending on the size of the steam line break, there are multiple pathways for steam blowdown.

Section 4.4.5 ARCON96 Results – 95th Percentile Control Room Atmospheric Dispersion Factors

For each of the release locations, the maximum atmospheric dispersion factor from either unit to any of the three control room air intakes is determined. The resultant 95th percentile control room atmospheric dispersion factors are presented in Table 4.4-11.

As discussed in Section 4.4.4.5, the control room atmospheric dispersion factor results for the MSSV stack release include credit for plume rise. MSSV plume rise credit may be modeled for any accident with an MSSV release.

The control room atmospheric dispersion factor results for the ADV stack release are presented with and without credit for plume rise. The determination of whether ADV plume rise credit can be taken must be determined on an accident-specific basis.

Control room occupancy factors are not included in the 95th percentile atmospheric dispersion factors reported in Table 4.4-11. Control room occupancy factors are modeled as separate input parameters to the dose analyses.

TABLE 4.4-11: 95th Percentile Control Room χ/Qs (sec/m^3) [without CR Occupancy Factors]

Time Interval	Main Plant Vent	Containment Shell	Equipment Hatch	ADV (no plume rise credit)	ADV (with plume rise credit)
0 to 2 hrs	~~1.14E-03~~ 1.15E-03	~~9.94E-04~~ 1.01E-3	~~7.99E-04~~ 8.01E-04	3.70E-03	7.40E-04
2 to 8 hrs	~~6.11E-04~~ 6.23E-04	~~6.32E-04~~ 6.41E-04	~~6.30E-04~~ 6.35E-04	~~1.97E-03~~ 1.99E-03	~~3.94E-04~~ 3.98E-04
8 to 24 hrs	~~2.10E-04~~ 2.14E-04	1.77E-04	~~1.77E-04~~ 1.78E-04	~~6.86E-04~~ 6.95E-04	~~1.37E-04~~ 1.39E-04
1 to 4 days	~~2.20E-04~~ 2.22E-04	~~2.34E-04~~ 2.36E-04	2.23E-04	~~6.97E-04~~ 7.04E-04	~~1.39E-04~~ 1.41E-04
4 to 30 days	~~1.98E-04~~ 2.02E-04	~~2.18E-04~~ 2.20E-04	2.03E-04	~~6.33E-04~~ 6.34E-04	1.27E-04

Time Interval	MSSV (with plume rise credit)	SLB-OC	AFW Turbine Exhaust	RWST	Fuel Handling Building
0 to 2 hrs	~~1.21E-03~~ 1.22E-03	~~7.74E-03~~ 7.78E-03	~~8.55E-04~~ 8.60E-04	~~5.65E-04~~ 5.67E-04	~~9.45E-04~~ 9.48E-04
2 to 8 hrs	~~7.48E-04~~ 7.52E-04	~~4.79E-03~~ 4.81E-03	~~3.60E-04~~ 3.70E-04	~~2.17E-04~~ 2.25E-04	~~7.48E-04~~ 7.61E-04
8 to 24 hrs	~~2.50E-04~~ 2.48E-04	1.62E-03	1.56E-04	~~8.67E-05~~ 8.84E-05	~~1.93E-04~~ 1.92E-04
1 to 4 days	2.86E-04	1.83E-03	~~1.60E-04~~ 1.61E-04	~~8.88E-05~~ 8.97E-05	~~2.64E-04~~ 2.65E-04
4 to 30 days	2.60E-04	1.68E-03	1.30E-04	~~7.33E-05~~ 7.37E-05	2.43E-04

TABLE 4.5-11: LOCA RELEASE PATH DOSE CONSEQUENCES

DOSE RECEPTOR	CONTAINMENT LEAKAGE DOSE (REM TEDE)	ESF LEAKAGE DOSE (REM TEDE)	RWST RELEASE DOSE (REM TEDE)	PASS LEAKAGE DOSE (REM TEDE)	PIPING SHINE DOSE (REM TEDE)
Control Room (30-day accident duration)					
Immersion and Inhalation	~~7.225E-01~~ 7.341E-01	~~4.697E-01~~ 4.791E-01	~~8.420E-01~~ 8.732E-01	~~1.461E-01~~ 1.490E-01	-
Control Room Filter Shine	~~1.446E-01~~ 1.469E-01	~~7.55E-02~~ 7.701E-02	~~1.263E-01~~ 1.310E-01	~~2.02E-02~~ 2.060E-02	-
Environmental Cloud Shine	~~4.373E-02~~ 4.443E-02	~~3.44E-03~~ 3.509E-03	~~1.134E-03~~ 1.176E-03	~~3.31E-03~~ 3.376E-03	-
Containment Building Shine	4.304E-04	-	-	-	-
Piping Shine	-	-	-	-	1.06E-01
TOTAL	~~9.112E-01~~ 9.259E-01	~~5.487E-01~~ 5.596E-01	~~9.694E-01~~ 1.005E+00	~~1.696E-01~~ 1.730E-01	1.06E-01
Exclusion Area Boundary (Maximum 2-hour dose)	3.548E+00 (0.6 to 2.6 hrs)	3.398E-01 (0.4 to 2.4 hrs)	1.103E+00 (94 to 96 hrs)	1.370E-01 (0.5 to 2.5 hrs)	-
Low Population Zone (30-day accident duration)	2.309E-01	2.381E-01	1.311E+00	6.897E-02	-

TABLE 4.5-12: LOCA DOSE CONSEQUENCES

DOSE RECEPTOR	LOCA DOSE (REM TEDE)	ACCEPTANCE CRITERION (REM TEDE)
Control Room (30-day accident duration)	~~2.7~~2.8	5
EAB (Maximum 2-hour dose)	5.1	25
LPZ (30-day accident duration)	1.8	25

TABLE 4.6-2: FHA-IC CR ATMOSPHERIC DISPERSION FACTORS

FHA-IC to CR 95th Percentile Atmospheric Dispersion Factors (seconds/m^3)				
Time Interval	Containment Shell Release Point	Equipment Hatch Release Point	Plant Vent Stack Release Point	Modeled Value
0 to 2 hours	~~9.94E-04~~ 1.01E-03	~~7.99E-04~~ 8.01E-04	~~1.14E-03~~ 1.15E-03	~~1.14E-03~~ 1.15E-03
2 to 8 hours	~~6.32E-04~~ 6.41E-04	~~6.30E-04~~ 6.35E-04	~~6.11E-04~~ 6.23E-04	~~6.32E-04~~ 6.41E-04
8 to 24 hours	1.77E-04	~~1.77E-04~~ 1.78E-04	~~2.10E-04~~ 2.14E-04	~~2.10E-04~~ 2.14E-04
1 to 4 days	~~2.34E-04~~ 2.36E-04	2.23E-04	~~2.20E-04~~ 2.22E-04	~~2.34E-04~~ 2.36E-04
4 to 30 days	~~2.18E-04~~ 2.20E-04	2.03E-04	~~1.98E-04~~ 2.02E-04	~~2.18E-04~~ 2.20E-04

Section 4.6.3 FHA-IC EAB and LPZ Model

Regulatory Guide 1.183 Regulatory Position 4.1 provides guidance to be used in determining the TEDE for persons located at or beyond the boundary of the exclusion area, including the outer boundary of the low population zone. Section 4.2 of this license amendment request addresses the applicability of this guidance to the SONGS Units 2 and 3 AST FHA-IC dose analysis as it relates to the offsite dose exposure parameters.

As discussed in Section 4.2, the FHA-IC dose analysis considers the dose consequences of inhalation and immersion. Radioactive material in the containment is assumed to be a negligible radiation shine source to the offsite dose receptors relative to the dose associated with immersion in the radioactive plume released from the facility.

Consistent with RG 1.183 Regulatory Positions 4.1.5, 4.1.6 and 4.4 and Table 6, the FHA-IC event radiological criterion for the EAB and for the outer boundary of the LPZ is 6.3 Rem TEDE.

Section 4.6.4 FHA-IC Control Room Model

RG 1.183 Regulatory Position 4.2 provides guidance to be used in determining the total effective dose equivalent for persons located in the control room. Section 4.3 addresses the applicability of this guidance to the SONGS Units 2 and 3 AST FHA-IC dose analysis as it relates to the control room dose exposure parameters.

The CREACUS Emergency mode of operation can be actuated either automatically following a CRIS or manually. The CRIS may be generated automatically by a SIAS or by the detection of high radioactivity concentrations in the control room outside air inflow. Per Section 4.3.2.1.1, the FHA-IC model credits CREACUS Emergency Mode of operation initiation 3 minutes following charcoal and HEPA filters for the removal of airborne gaseous and particulate activity following an FHA.

The release of activity to the environment within the required 2-hour time period is established by specifying a FHB air exhaust flow rate that ensures that at least 99.9 percent of the gaseous activity will be released to the environment.

Activity released during the FHA-FHB event is transported by atmospheric dispersion to the control room HVAC intake and to the offsite EAB and LPZ dose receptors. Activity may be released to the environment via the FHB normal ventilation exhaust system through the main plant vent, or as leakage through FHB penetrations (e.g., doors). Table 4.7-2 presents the San Onofre site-specific 95th percentile meteorology atmospheric dispersion factors for these release pathways as discussed in Section 4.4. Since one set of atmospheric dispersion factors does not consistently yield less dispersion than the others over time, a composite maximum of the two release points is utilized for assessing control room dose consequences. No credit is taken for radioactive decay of the isotopes during atmospheric dispersion transit to the control room or offsite dose locations. Consistent with RG 1.183 Regulatory Positions 4.1.7 and 4.2.2, no correction is made for depletion of the effluent plume by deposition on the ground.

TABLE 4.7-2: FHA-FHB CR ATMOSPHERIC DISPERSION FACTORS

FHA-FHB to CR 95th Percentile Atmospheric Dispersion Factors (seconds/m^3)			
Time Interval	FHB Release Point	Main Plant Vent Release Point	Modeled Value
0 to 2 hours	~~9.45E-04~~9.48E-04	~~1.14E-03~~1.15E-03	~~1.14E-03~~1.15E-03
2 to 8 hours	~~7.48E-04~~7.61E-04	~~6.11E-04~~6.23E-04	~~7.48E-04~~7.61E-04
8 to 24 hours	~~1.93E-04~~1.92E-04	~~2.10E-04~~2.14E-04	~~2.10E-04~~2.14E-04
1 to 4 days	~~2.64E-04~~2.65E-04	~~2.20E-04~~2.22E-04	~~2.64E-04~~2.65E-04
4 to 30 days	2.43E-04	~~1.98E-04~~2.02E-04	2.43E-04

Section 4.7.3 FHA-FHB EAB and LPZ Model

Regulatory Guide 1.183 Regulatory Position 4.1 provides guidance to be used in determining the TEDE for persons located at or beyond the boundary of the exclusion area, including the outer boundary of the low population zone. Section 4.2 addresses the applicability of this guidance to the SONGS Units 2 and 3 AST FHA-FHB dose analysis as it relates to the offsite dose exposure parameters.

As discussed in Section 4.2, the FHA-FHB dose analysis considers the dose consequences of inhalation and immersion. Radioactive material in the FHB is assumed to be a negligible radiation shine source to the offsite dose receptors the start of the event, due to detection of high radioactivity concentrations in the control room outside air inflow.

As discussed in Section 4.3, the pre-trip SLB-OC dose analysis considers the dose consequences of inhalation, immersion, and radiation shine from the environmental (or outside) cloud, and the control room emergency HVAC filters.

Consistent with RG 1.183 Regulatory Position 4.4, as an AST dose analysis acceptance criterion the postulated control room dose is evaluated to ensure that that it does not exceed the 5 Rem TEDE criterion established in 10 CFR 50.67.

Section 4.8.5 Pre-Trip SLB-OC Dose Consequences

The resulting pre-trip SLB-OC offsite and control room operator doses are listed in Table 4.8-3. The analysis demonstrates that the SLB event 25 Rem TEDE radiological criterion for the EAB and for the outer boundary of the LPZ is met. The analysis also demonstrates that the SLB event 5 Rem TEDE radiological criterion for the control room is met.

TABLE 4.8-3: PRE-TRIP SLB-OC DOSE CONSEQUENCES

DOSE RECEPTOR	PRE-TRIP SLB-OC DOSE (REM TEDE)	ACCEPTANCE CRITERION (REM TEDE)
Control Room (30-day accident duration)	~~2.1~~2.2	5
EAB (Maximum 2-hour dose -- 0.0 to 2.0 hours)	4.1	25
LPZ (30-day accident duration)	0.1	25

Table 5-1 – Comparison of Previous and AST Doses		
Event – Dose Receptor	**"Effective" TEDE of Previous Dose Analyses (Rem)**	**AST TEDE (Rem)**
FHA-IC		
Control Room	1.0	2.7 E-01
EAB	2.0	8.0 E-01
LPZ	5.6 E-02	2.3 E-02
FHA-FHB		
Control Room	3.7 E-01	7.3 E-02
EAB	6.6 E-01	2.1 E-01
LPZ	1.9 E-02	6.1 E-03
LOCA		
Control Room	4.5	~~2.7~~2.8
EAB	3.7	5.1
LPZ	1.2	1.8
SLB-OC		
Control Room	Not evaluated	~~2.1~~2.2
EAB	8.0	4.1
LPZ	Not evaluated	0.1

The proposed changes do not increase the probability of an accident previously evaluated. The proposed changes result in dose consequences that, if compared to previous ones, are in most cases decreased and in other cases only slightly increased (using guidance in footnote 7 of RG 1.183). However, the dose consequences of the revised analyses are below the AST regulatory acceptance criteria.

Therefore, the proposed change does not involve a significant increase in the probability or consequences of any accident previously evaluated.

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

Response: No.

The implementation of this proposed change does not create the possibility of an accident of a different type than was previously evaluated in the UFSAR. The proposed change credits the AST for the design basis radiological site boundary and control room dose analyses and expands the allowed use of fuel failure estimates by DNB statistical convolution methodology from only the reactor coolant pump sheared shaft event to the UFSAR Chapter 15 non-LOCA events that assume a loss of flow (i.e., a loss of AC power) and that fail fuel.

Using the methods described in RG 1.183 and 1.194, the results of the new analyses for the LOCA, FHA-IC, FHA-FHB, and SLB-OC meet the criteria of 10 CFR 50.67 as shown in Table 5-2. These results demonstrate that the 10CFR50.67 dose acceptance criteria for exclusion area boundary, low population zone, and control room are met for these four events. In addition, the analysis results described in Section 4 above also show that the exclusion area boundary and low population zone dose acceptance criteria from Regulatory Guide 1.183, Table 6 are met.

Table 5-2 – Comparison of AST Doses with AST Dose Criteria

Event – Dose Receptor	AST TEDE (Rem)	AST TEDE Dose Acceptance Criteria (Rem)
FHA-IC		
Control Room	0.3	5
EAB	0.8	6.3
LPZ	< 0.1	6.3
FHA-FHB		
Control Room	< 0.1	5
EAB	0.2	6.3
LPZ	< 0.1	6.3
LOCA		
Control Room	~~2.7~~2.8	5
EAB	5.1	25
LPZ	1.8	25
SLB-OC		
Control Room	~~2.1~~2.2	5
EAB	4.1	25
LPZ	0.1	25

In conclusion, based on the considerations discussed above, (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 amendment will not be inimical to the common defense and security or to the health and safety of the public.

6.0 ENVIRONMENTAL CONSIDERATION

A review has determined that the proposed amendment would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10CFR20, or would change an inspection or surveillance requirement. However, the proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational

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of 335 or 500 times greater than the release rate corresponding to the iodine concentration at the equilibrium value of 1.0 µCi/gram DE I-131 specified in the Technical Specifications. The calculation of the concurrent iodine spike release rate conservatively assumed maximum letdown flow, maximum allowable identified and unidentified primary coolant leak rates, maximum allowable primary-to-secondary leak rate, maximum reactor coolant pump seal controlled bleed-off flow rate, 100 percent removal of all iodine from the letdown stream by the purification ion exchanger, and minimum reactor coolant system mass. Table 4.1-6 summarizes the concurrent iodine spike release rate in terms of escape rate coefficients that are to be modeled with the AST reactor core iodine inventory and an assumed 0.62 percent failed fuel. As an example, when the iodine spike release rate for the equilibrium case of 1.3E-08 sec^{-1} is modeled with the AST reactor core iodine inventory and 0.62 percent fuel failure, the resultant equilibrium primary coolant iodine activity concentration is 1.0 µCi/gram DE I-131.

TABLE 4.1-6: CONCURRENT IODINE SPIKE ESCAPE RATE COEFFICIENTS

Condition	Iodine Escape Rate Coefficient [1/second]	Iodine Escape Rate Coefficient [1/hour]
Equilibrium (no spike)	1.3E-08	4.7E-05
Spiking Factor of 500	6.5E-06	2.4E-02
Spiking Factor of 335	4.4E-06	1.6E-02

Section 4.1.3 Radial Peaking Factor

Consistent with the guidance of RG 1.183 Regulatory Position 3.1, to account for differences in power level across the core, Radial Peaking Factors (RPFs) are applied to the Section 4.1.1 Tables 4.1-3 and 4.1-4 average fuel rod isotope inventory in determining the activity inventory of the damaged fuel rods when only a portion of the core is damaged.

Per RG 1.183 Regulatory Position 3.1, the RPFs should be values from the facility's Core Operating Limits Report (COLR) or Technical Specifications. SONGS Units 2 and 3 do not report RPFs in the facility's COLR or in the SONGS Technical Specifications. SONGS Units 2 and 3 calculate RPFs in unit and cycle specific reload physics analyses.

A review of the recent SONGS Units 2 and 3 Cycle 11 and 12 reload physics analyses identified RPFs with values no greater than 1.67 at 100 percent power. For conservatism the non-LOCA AST dose calculations addressed in this AST license amendment request model an RPF of 1.75 for all damaged fuel rods. For the DBA LOCA, all fuel assemblies are damaged and the core average inventory (without peaking factor) is used.

Parameter	Acceptable Input	Comments
		Steam from a steam line break outside containment (SLB-OC) is assumed to be released via the blowout panels mounted on the roof of the respective Main Steam Isolation Valve (MSIV)/Main Feedwater Isolation Valve (MFIV) enclosure directly above the main steam line. The χ/Qs for an MSSV release credit plume rise due to jet effects in accordance with section 6.0 of RG 1.194.
Building Area, meters^2	Use the actual building vertical cross-sectional area perpendicular to the wind direction. Use default of 2000 m^2 if the area is not readily available. Do not enter zero. Use 0.01 m^2 if a zero entry is desired. Note: This building area is for the building(s) that has the largest impact on the building wake within the wind direction window. This is usually, but need not always be, the reactor containment. With regard to the diffuse area source option, the building area entered here may be different from that used to establish the diffuse source.	The cross-sectional area of the containment is used for all release points except for the Fuel Handling Building (FHB). For the FHB release, the FHB east cross-section area and one half of the containment cross-section area are used. Only one half of the containment is conservatively considered since it is partially offset from the release to intake axis. All other intervening buildings, such as the auxiliary building, are conservatively ignored.
Vertical Velocity, meters/seconds	Note: the vent release model should not be used for DBA accident calculations. For stack release calculations only, use the actual vertical velocity if the licensee can demonstrate with reasonable assurance that the value will be maintained during the course of the accident (e.g., addressed by technical specifications), otherwise, enter zero. If the vertical velocity is set to zero, ARCON96 will reduce the stack height by 6 times the stack radius for all wind speeds. If this reduction is not desired, the stack radius should also be set to zero.	The vent release model is not used for DBA accident calculations. For all vent stack releases, the vertical velocity is set to zero.

Parameter	Acceptable Input	Comments
Direction to Source, degrees	Use the direction FROM the intake back TO the release point. (Wind directions are reported as the direction from which the wind is blowing. Thus, if the direction from the intake to the release point is north, a north wind will carry the plume from the release point to the intake.) Note: some facilities have a "plant north" shown on site arrangement drawings that is different from "true north." The direction entered must have the same point of reference as the wind directions reported in the meteorological data. For ground level releases, if the plume is assumed to flow around a building rather than over it, the direction may need to be modified to account for the redirected flow. In this case, the χ/Q should be calculated assuming flow around and flow over (through) the building and the higher of the two χ/Q s should be used.	SONGS' meteorological data are given relative to true north. SONGS' site arrangement drawings do have a "Plant North" designation that is 57 degrees west of "true north;" consequently, source-to-receptor directions entered into the ARCON96 code are corrected to model true north as the point of reference. For the scenario of an equipment hatch release, the χ/Q is calculated assuming flow both around and over (through) the containment building, and the higher of the χ/Q values is used.
Surface Roughness Length, meters	Use a value of 0.2 in lieu of the default value of 0.1 for most sites. (Reasonable values range from 0.1 for sites with low surface vegetation to 0.5 for forest covered sites.)	Used value of 0.2. SONGS is a seaside site with low surface vegetation.
Wind Direction Window, degrees Code Default	Use the default window of 90 degrees (45 degrees on either side of line of sight from the source to the receptor).	Used 90 degrees.
Minimum Wind Speed, meters/second Code Default	Use the default wind speed of 0.5 m/s (regardless of the wind speed units entered earlier), unless there is some indication that the anemometer threshold is greater than 0.6 m/s.	Used the default wind speed of 0.5 m/s. The minimum SONGS site meteorological tower wind speed reported is 0.3 mph, or 0.13 m/s. Thus, the anemometer threshold is less than 0.6 m/s.
Averaging Sector Width Constant Code Default	Although the default value is 4, a value of 4.3 is preferred. (A future revision to ARCON96 will change the default to 4.3)	Used 4.3.
Initial Diffusion Coefficients, meters	These values will normally be set to zero. If the diffuse source option is being used, see Regulatory Position 2.2.4.	For containment releases, a diffuse source is modeled in accordance with Regulatory Guide 1.194, section 3.2.4.4. For the steam line break outside containment, the releases from the MSIV/MFIV enclosure are modeled as an area source in accordance with Regulatory Guide 1.194, section 3.2.4.7.

steam safety valves. RG 1.194 Section 6.0 states that in lieu of mechanistically addressing the amount of buoyant plume rise:

> "...the ground level χ/Q value calculated with ARCON96 (on the basis of the physical height of the release point) may be reduced by a factor of 5. This reduction may be taken only if (1) the release point is uncapped and vertically oriented and (2) the time-dependent vertical velocity exceeds the 95th-percentile wind speed (at the release point height) by a factor of 5."

The MSSVs are uncapped and vertically oriented, thereby satisfying the first criterion required for plume rise credit per RG 1.194, Section 6.0.

Since the MSSV stack exit is at plant elevation 73.4 ft and grade is at plant elevation 30 ft, the height of the stack exit above grade is 43.4 ft, or 13.2 meters. This is reasonably close to the height of the lower meteorological tower wind measurement instrumentation at 10 meters; therefore, the MSSV stack exit velocity is compared with the 95th percentile 10-m wind speed of 5.5 m/s.

For purposes of calculating the minimum flow velocity at the exit of the MSSV stack, the following conservative assumptions are made:

1. All MSSVs lift at the lowest set pressure of all the valves.
2. The pressure in the MSSV stack is equal to the maximum backpressure.
3. No credit is taken for head loss due to elevation changes or pipe friction.
4. No credit is taken for expansion of the steam through the stack.

The calculated minimum MSSV stack exit velocity is 72 meters/second. This exit velocity exceeds five times the 95th percentile wind speed (i.e., exceeds 5 x 5.5 m/s = 27.5 m/s); thereby satisfying the second criterion required for plume rise credit per RG 1.194 Section 6.0.

Since both criteria are satisfied, the ground level atmospheric dispersion factors calculated with ARCON96 (on the basis of the physical height of the release point) for MSSV releases are reduced by a factor of 5. The resultant 95th percentile control room atmospheric dispersion factors for the MSSV release path with credit for plume rise are presented in Section 4.4.5.

Section 4.4.4.6 Atmospheric Dump Valve (ADV) Stack Release

Atmospheric dispersion between the ADV and the control room HVAC intakes is modeled as a point source using the ARCON96 ground level release option. Per RG 1.194 Section 6.0 (and as justified in the following text), a reduction factor of 5 may be applied to the ARCON96 results to allow credit for buoyant plume rise in determining the Control Room atmospheric dispersion factors associated with the energetic release from atmospheric dump valves.

The ADVs are uncapped and vertically oriented, thereby satisfying the first criterion required for plume rise credit per RG 1.194 Section 6.0.

Since the ADV stack exit is at plant elevation 113.92 ft and grade is at plant elevation 30 ft, the height of the stack exit above grade is 83.92 ft, or 25.6 meters. Since the ADV stack exit is closer in height to the upper meteorological tower wind measurement instrumentation at 40 meters than to the lower meteorological tower wind measurement instrumentation at 10 meters, the ADV stack exit velocity is compared with the 95th percentile 40-m wind speed of 6.4 m/s.

The accident analyses assume that an ADV is operated manually; therefore, the flow velocity at the ADV stack exit will decrease over time, as the steam generator blows down. Thus, in order to credit plume rise in an ADV release dose analysis, the period for which the ADV stack exit vertical flow velocity exceeds five times the 95th percentile upper level wind speed of 6.4 m/s (i.e., exceeds 5 x 6.4 m/s = 32 m/s) would need to be determined.

Since the second criterion is not necessarily satisfied for the duration of a dose analysis, the ground level atmospheric dispersion factors calculated with ARCON96 (on the basis of the physical height of the release point) for ADV releases may or may not be reduced by a factor of 5 for the duration of a dose analysis. The resultant 95th percentile control room atmospheric dispersion factors for the ADV release path with and without credit for plume rise are presented in Section 4.4.5. The use of the lower values crediting plume rise will be evaluated on an event-specific basis.

Section 4.4.4.7 Steam Line Break Outside Containment (SLB-OC) Release

Atmospheric dispersion between the steam line break outside containment and the control room HVAC intakes is modeled as an area (diffuse) source using the ARCON96 ground level release option.

The SLB-OC is postulated to occur outboard of the main steam line restraint/anchor downstream of the main steam isolation valve. Thus, the location of the postulated break is in the walkway between the east wall of the Turbine Building and the Main Steam Isolation Valve/Main Feedwater Isolation Valve (MSIV/MFIV) enclosure structures. The enclosure structures are open to the walkway, which is then open to the atmosphere above. Several blowout panels are present on the roofs of the enclosure structures. There are also blowout panels on the walls of the MSIV/MFIV enclosure. The blowout panels open during a large SLB-OC to protect the enclosure structures from overpressurizing. Thus, depending on the size of the steam line break, there are multiple pathways for steam blowdown.

Section 4.4.5 ARCON96 Results – 95th Percentile Control Room Atmospheric Dispersion Factors

For each of the release locations, the maximum atmospheric dispersion factor from either unit to any of the three control room air intakes is determined. The resultant 95th percentile control room atmospheric dispersion factors are presented in Table 4.4-11.

As discussed in Section 4.4.4.5, the control room atmospheric dispersion factor results for the MSSV stack release include credit for plume rise. MSSV plume rise credit may be modeled for any accident with an MSSV release.

The control room atmospheric dispersion factor results for the ADV stack release are presented with and without credit for plume rise. The determination of whether ADV plume rise credit can be taken must be determined on an accident-specific basis.

Control room occupancy factors are not included in the 95th percentile atmospheric dispersion factors reported in Table 4.4-11. Control room occupancy factors are modeled as separate input parameters to the dose analyses.

TABLE 4.4-11: 95th Percentile Control Room χ/Qs (sec/m^3) [without CR Occupancy Factors]

Time Interval	Main Plant Vent	Containment Shell	Equipment Hatch	ADV (no plume rise credit)	ADV (with plume rise credit)
0 to 2 hrs	1.15E-03	1.01E-03	8.01E-04	3.70E-03	7.40E-04
2 to 8 hrs	6.23E-04	6.41E-04	6.35E-04	1.99E-03	3.98E-04
8 to 24 hrs	2.14E-04	1.77E-04	1.78E-04	6.95E-04	1.39E-04
1 to 4 days	2.22E-04	2.36E-04	2.23E-04	7.04E-04	1.41E-04
4 to 30 days	2.02E-04	2.20E-04	2.03E-04	6.34E-04	1.27E-04

Time Interval	MSSV (with plume rise credit)	SLB-OC	AFW Turbine Exhaust	RWST	Fuel Handling Building
0 to 2 hrs	1.22E-03	7.78E-03	8.60E-04	5.67E-04	9.48E-04
2 to 8 hrs	7.52E-04	4.81E-03	3.70E-04	2.25E-04	7.61E-04
8 to 24 hrs	2.48E-04	1.62E-03	1.56E-04	8.84E-05	1.92E-04
1 to 4 days	2.86E-04	1.83E-03	1.61E-04	8.97E-05	2.65E-04
4 to 30 days	2.60E-04	1.68E-03	1.30E-04	7.37E-05	2.43E-04

TABLE 4.5-11: LOCA RELEASE PATH DOSE CONSEQUENCES

DOSE RECEPTOR	CONTAINMENT LEAKAGE DOSE (REM TEDE)	ESF LEAKAGE DOSE (REM TEDE)	RWST RELEASE DOSE (REM TEDE)	PASS LEAKAGE DOSE (REM TEDE)	PIPING SHINE DOSE (REM TEDE)
Control Room (30-day accident duration)					
Immersion and Inhalation	7.341E-01	4.791E-01	8.732E-01	1.490E-01	-
Control Room Filter Shine	1.469E-01	7.701E-02	1.310E-01	2.060E-02	-
Environmental Cloud Shine	4.443E-02	3.509E-03	1.176E-03	3.376E-03	-
Containment Building Shine	4.304E-04	-	-	-	-
Piping Shine	-	-	-	-	1.06E-01
TOTAL	9.259E-01	5.596E-01	1.005E+00	1.730E-01	1.06E-01
Exclusion Area Boundary (Maximum 2-hour dose)	3.548E+00 (0.6 to 2.6 hrs)	3.398E-01 (0.4 to 2.4 hrs)	1.103E+00 (94 to 96 hrs)	1.370E-01 (0.5 to 2.5 hrs)	-
Low Population Zone (30-day accident duration)	2.309E-01	2.381E-01	1.311E+00	6.897E-02	-

TABLE 4.5-12: LOCA DOSE CONSEQUENCES

DOSE RECEPTOR	LOCA DOSE (REM TEDE)	ACCEPTANCE CRITERION (REM TEDE)
Control Room (30-day accident duration)	2.8	5
EAB (Maximum 2-hour dose)	5.1	25
LPZ (30-day accident duration)	1.8	25

TABLE 4.6-2: FHA-IC CR ATMOSPHERIC DISPERSION FACTORS

FHA-IC to CR 95th Percentile Atmospheric Dispersion Factors (seconds/m^3)				
Time Interval	Containment Shell Release Point	Equipment Hatch Release Point	Plant Vent Stack Release Point	Modeled Value
0 to 2 hours	1.01E-03	8.01E-04	1.15E-03	1.15E-03
2 to 8 hours	6.41E-04	6.35E-04	6.23E-04	6.41E-04
8 to 24 hours	1.77E-04	1.78E-04	2.14E-04	2.14E-04
1 to 4 days	2.36E-04	2.23E-04	2.22E-04	2.36E-04
4 to 30 days	2.20E-04	2.03E-04	2.02E-04	2.20E-04

Section 4.6.3 FHA-IC EAB and LPZ Model

Regulatory Guide 1.183 Regulatory Position 4.1 provides guidance to be used in determining the TEDE for persons located at or beyond the boundary of the exclusion area, including the outer boundary of the low population zone. Section 4.2 of this license amendment request addresses the applicability of this guidance to the SONGS Units 2 and 3 AST FHA-IC dose analysis as it relates to the offsite dose exposure parameters.

As discussed in Section 4.2, the FHA-IC dose analysis considers the dose consequences of inhalation and immersion. Radioactive material in the containment is assumed to be a negligible radiation shine source to the offsite dose receptors relative to the dose associated with immersion in the radioactive plume released from the facility.

Consistent with RG 1.183 Regulatory Positions 4.1.5, 4.1.6 and 4.4 and Table 6, the FHA-IC event radiological criterion for the EAB and for the outer boundary of the LPZ is 6.3 Rem TEDE.

Section 4.6.4 FHA-IC Control Room Model

RG 1.183 Regulatory Position 4.2 provides guidance to be used in determining the total effective dose equivalent for persons located in the control room. Section 4.3 addresses the applicability of this guidance to the SONGS Units 2 and 3 AST FHA-IC dose analysis as it relates to the control room dose exposure parameters.

The CREACUS Emergency mode of operation can be actuated either automatically following a CRIS or manually. The CRIS may be generated automatically by a SIAS or by the detection of high radioactivity concentrations in the control room outside air inflow. Per Section 4.3.2.1.1, the FHA-IC model credits CREACUS Emergency Mode of operation initiation 3 minutes following charcoal and HEPA filters for the removal of airborne gaseous and particulate activity following an FHA.

The release of activity to the environment within the required 2-hour time period is established by specifying a FHB air exhaust flow rate that ensures that at least 99.9 percent of the gaseous activity will be released to the environment.

Activity released during the FHA-FHB event is transported by atmospheric dispersion to the control room HVAC intake and to the offsite EAB and LPZ dose receptors. Activity may be released to the environment via the FHB normal ventilation exhaust system through the main plant vent, or as leakage through FHB penetrations (e.g., doors). Table 4.7-2 presents the San Onofre site-specific 95th percentile meteorology atmospheric dispersion factors for these release pathways as discussed in Section 4.4. Since one set of atmospheric dispersion factors does not consistently yield less dispersion than the others over time, a composite maximum of the two release points is utilized for assessing control room dose consequences. No credit is taken for radioactive decay of the isotopes during atmospheric dispersion transit to the control room or offsite dose locations. Consistent with RG 1.183 Regulatory Positions 4.1.7 and 4.2.2, no correction is made for depletion of the effluent plume by deposition on the ground.

TABLE 4.7-2: FHA-FHB CR ATMOSPHERIC DISPERSION FACTORS

FHA-FHB to CR 95th Percentile Atmospheric Dispersion Factors (seconds/m^3)			
Time Interval	FHB Release Point	Main Plant Vent Release Point	Modeled Value
0 to 2 hours	9.48E-04	1.15E-03	1.15E-03
2 to 8 hours	7.61E-04	6.23E-04	7.61E-04
8 to 24 hours	1.92E-04	2.14E-04	2.14E-04
1 to 4 days	2.65E-04	2.22E-04	2.65E-04
4 to 30 days	2.43E-04	2.02E-04	2.43E-04

Section 4.7.3 FHA-FHB EAB and LPZ Model

Regulatory Guide 1.183 Regulatory Position 4.1 provides guidance to be used in determining the TEDE for persons located at or beyond the boundary of the exclusion area, including the outer boundary of the low population zone. Section 4.2 addresses the applicability of this guidance to the SONGS Units 2 and 3 AST FHA-FHB dose analysis as it relates to the offsite dose exposure parameters.

As discussed in Section 4.2, the FHA-FHB dose analysis considers the dose consequences of inhalation and immersion. Radioactive material in the FHB is assumed to be a negligible radiation shine source to the offsite dose receptors the start of the event, due to detection of high radioactivity concentrations in the control room outside air inflow.

As discussed in Section 4.3, the pre-trip SLB-OC dose analysis considers the dose consequences of inhalation, immersion, and radiation shine from the environmental (or outside) cloud, and the control room emergency HVAC filters.

Consistent with RG 1.183 Regulatory Position 4.4, as an AST dose analysis acceptance criterion the postulated control room dose is evaluated to ensure that that it does not exceed the 5 Rem TEDE criterion established in 10 CFR 50.67.

Section 4.8.5 Pre-Trip SLB-OC Dose Consequences

The resulting pre-trip SLB-OC offsite and control room operator doses are listed in Table 4.8-3. The analysis demonstrates that the SLB event 25 Rem TEDE radiological criterion for the EAB and for the outer boundary of the LPZ is met. The analysis also demonstrates that the SLB event 5 Rem TEDE radiological criterion for the control room is met.

TABLE 4.8-3: PRE-TRIP SLB-OC DOSE CONSEQUENCES

DOSE RECEPTOR	PRE-TRIP SLB-OC DOSE (REM TEDE)	ACCEPTANCE CRITERION (REM TEDE)
Control Room (30-day accident duration)	2.2	5
EAB (Maximum 2-hour dose -- 0.0 to 2.0 hours)	4.1	25
LPZ (30-day accident duration)	0.1	25

Table 5-1 – Comparison of Previous and AST Doses		
Event – Dose Receptor	**"Effective" TEDE of Previous Dose Analyses (Rem)**	**AST TEDE (Rem)**
FHA-IC		
Control Room	1.0	2.7 E-01
EAB	2.0	8.0 E-01
LPZ	5.6 E-02	2.3 E-02
FHA-FHB		
Control Room	3.7 E-01	7.3 E-02
EAB	6.6 E-01	2.1 E-01
LPZ	1.9 E-02	6.1 E-03
LOCA		
Control Room	4.5	2.8
EAB	3.7	5.1
LPZ	1.2	1.8
SLB-OC		
Control Room	Not evaluated	2.2
EAB	8.0	4.1
LPZ	Not evaluated	0.1

The proposed changes do not increase the probability of an accident previously evaluated. The proposed changes result in dose consequences that, if compared to previous ones, are in most cases decreased and in other cases only slightly increased (using guidance in footnote 7 of RG 1.183). However, the dose consequences of the revised analyses are below the AST regulatory acceptance criteria.

Therefore, the propsosed change does not involve a significant increase in the probability or consequences of any accident previously evaluated.

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

Response: No.

The implementation of this proposed change does not create the possibility of an accident of a different type than was previously evaluated in the UFSAR. The proposed change credits the AST for the design basis radiological site boundary and control room dose analyses and expands the allowed use of fuel failure estimates by DNB statistical convolution methodology from only the reactor coolant pump sheared shaft event to the UFSAR Chapter 15 non-LOCA events that assume a loss of flow (i.e., a loss of AC power) and that fail fuel.

Using the methods described in RG 1.183 and 1.194, the results of the new analyses for the LOCA, FHA-IC, FHA-FHB, and SLB-OC meet the criteria of 10 CFR 50.67 as shown in Table 5-2. These results demonstrate that the 10CFR50.67 dose acceptance criteria for exclusion area boundary, low population zone, and control room are met for these four events. In addition, the analysis results described in Section 4 above also show that the exclusion area boundary and low population zone dose acceptance criteria from Regulatory Guide 1.183, Table 6 are met.

Table 5-2 – Comparison of AST Doses with AST Dose Criteria		
Event – Dose Receptor	**AST TEDE (Rem)**	**AST TEDE Dose Acceptance Criteria (Rem)**
FHA-IC		
Control Room	0.3	5
EAB	0.8	6.3
LPZ	< 0.1	6.3
FHA-FHB		
Control Room	< 0.1	5
EAB	0.2	6.3
LPZ	< 0.1	6.3
LOCA		
Control Room	2.8	5
EAB	5.1	25
LPZ	1.8	25
SLB-OC		
Control Room	2.2	5
EAB	4.1	25
LPZ	0.1	25

In conclusion, based on the considerations discussed above, (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 amendment will not be inimical to the common defense and security or to the health and safety of the public.

6.0 ENVIRONMENTAL CONSIDERATION

A review has determined that the proposed amendment would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10CFR20, or would change an inspection or surveillance requirement. However, the proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational