Calculation Number:	Revision:	Total No. Pages (incl. cover):
RWA-1313-001	1	22

Calculation Title:

Cook Nuclear Plant AST Radiological Analysis Input Parameter Development

Calculation Quality Classification: ☒ **Safety** ☐ **Non-safety**

Verification Performed: ☒ **Review** ☐ **Alternate Calculation** ☐ **Testing**

Description:

This calculation compiles plant input parameters for use in the Cook radiological analysis which is performed using the Alternative Source Term methodology.

Revision 1 is performed to change the basis for the fraction of the primary-to-secondary leakage which flashes to steam on the secondary side of the steam generators. In addition, clarifying information has been provided regarding the VCT rupture isolation time.

Digital Signature or Printed Name, Signature, and Date:	Applicable Sections:
Preparer: Mark Pope Digitally signed by Mark Pope Date:2016.02.12 16:04:02 EST	All
Reviewer: Nathan Block Digitally signed by Nathan Block Date: 2016.02.12 16:05:58 EST	All
Approver: Joe Sinodis Digitally signed by Joe Sinodis Date:2016.02.12 16:12:48 EST	All

Table of Contents

List of Figures

1 Purpose

This calculation compiles plant input parameters for use in the Cook radiological analysis. The calculation serves two main purposes. First, it provides a single, referenceable source for dose analysis parameters, which ensures that a consistent set of inputs are applied throughout the individual event calculations. As such, the values and sources of the specific parameters are cited and reviewed one time for the entire dose analysis project. Secondly, this calculation provides a comprehensive list of plant parameters that are important to the plant radiological consequences. This document can serve as a convenient tool to assist plant personnel in determining the impact of future design changes and in assessing the consequences of those changes when performing 50.59 evaluations.

2 Methodology

This calculation is primarily a list of parameters with cited references. In some cases, minor mathematical computations may be performed. Some guidance is taken from Regulatory Guide 1.183 (Reference 7.1) since the radiological analyses in which the parameters are used is performed using the alternative source term methodology. It is important to note that the value of the parameter shown reflects the value from the applicable reference and does not necessarily indicate the value of the parameter used in the event calculations. Any comments included with the parameter should be given equal weight with the value of the parameter itself. These comments may modify the numerical value, describe how it is applied in the event calculation, identify the direction of conservatism, or cite the regulatory requirement for why it is included. Note that when a specific Cook unit is not specified, the input values apply to both Units 1 and 2, and are considered bounding values for both units.

3 Inputs

Inputs to this calculation are not conventional design inputs. All parameters which are important to the consequences of the radiological analysis are identified, which may include:

- Design requirements
- Procedural controls
- System alignments
- Licensing limits
- Calculation and analysis results
- Operator actions
- Plant measurements

4 Assumptions

Some of the parameter values listed in this calculation are simply assumptions and are not specifically identified as such. However, once applied in the event analyses, these assumptions become design limits. For example, the backleakage rate to the RWST is somewhat arbitrarily selected in this document to create operational margin to actual measured leak rates. However, since it is defined here and applied in the LOCA analysis, this assumption becomes the leak rate limit.

5 Calculations

The radiological analysis inputs are compiled and presented in Attachment A.

6 Conclusions

The data provided in Attachment A provides a comprehensive set of inputs that are acceptable for use in performing safety-related dose analyses.

7 References

7.1 USNRC Regulatory Guide 1.183, "Alternative Radiological Source Terms for Evaluating Design Basis Accidents at Nuclear Power Reactors", July 2000.

7.2 D. C. Cook Unit 1 Renewed Facility Operating License No. DPR-58 through Amendment 328.

7.3 D. C. Cook Unit 2 Renewed Facility Operating License No. DPR-74 through Amendment 310.

7.4 D. C. Cook Unit 1 Technical Specifications through Amendment 328.

7.5 D. C. Cook Unit 2 Technical Specifications through Amendment 310.

7.6 D.C. Cook Updated Final Safety Analysis Report, Revision 26.

7.7 Safety Evaluation Report, "Donald C. Cook Nuclear Plant, Unit 1 – Issuance of Amendment 273 Regarding Measurement Uncertainty Recapture Power Uprate (TAC NO. MB5498)", December 20, 2002 (ML023470126).

7.8 Indiana Michigan Power letter AEP:NRC:3902-01, "Donald C. Cook Nuclear Plant Unit 2, Review of Draft Safety Evaluation for Measurement Uncertainty Recapture Power Uprate (TAC NO. MB6751)", April 25, 2003 (ML031270262).

7.9 Safety Evaluation Report, "Donald C. Cook Nuclear Plant, Unit 2 – Issuance of Amendment 259 Regarding Measurement Uncertainty Recapture Power Uprate (TAC NO. MB6751)", May 2, 2003 (ML030990094).

7.10 Drawing OP-1-5147A-39, "Flow Diagram, Containment Ventilation, Unit No. 1".

7.11 Drawing OP-2-5147A-46, "Flow Diagram, Containment Ventilation, Unit No. 2".

7.12 Drawing OP-12-5148-63, "Flow Diagram, Auxiliary Building Ventilation Units #1 and #2".

7.13 Drawing OP-1-5149-49, “Flow Diagram, Control Room Ventilation, Unit No. 1”.

7.14 Drawing OP-2-5149-58, “Flow Diagram, Control Room Ventilation, Unit No. 2”.

7.15 Procedure 1-OHP-4030-127-041, “Refueling Integrity”, Rev. 30.

7.16 Procedure 2-OHP-4030-227-041, “Refueling Integrity”, Rev. 32.

7.17 Engineering Control Package ECP 1-05-01, “Precautions, Limitations, and Setpoints, Unit 1”, Rev. 20.

7.18 Engineering Control Package ECP 2-05-01, “Precautions, Limitations, and Setpoints, Unit 2”, Rev. 17.

7.19 Procedure PMP-5076-ULR-001, “Reactor Coolant System Leakage Monitoring Program”, Rev. 4.

7.20 Procedure OHI-4032, “Leakage Monitoring Program”, Rev. 15.

7.21 Calculation PRA-DOSE-011, “Containment Sprayed Volumes, Unsprayed Volumes, and Average Spray Fall Heights”, Rev. 0.

7.22 Letter Report RWA-L-1313-002, Subject: Review of Calculation PRA-DOSE-011, “Containment Sprayed Volumes, Unsprayed Volumes, and Average Spray Fall Heights,” July 1, 2013.

7.23 Calculation MD-12-HV-005-N, “Control Room Pressure Boundary Volume”, Rev. 0.

7.24 Calculation CN-CRA-99-55, “Donald C. Cook Steam Generator Tube Rupture T&H Analysis for NUREG-1465 Dose Project - Revised”, Rev. 1.

7.25 Calculation CN-CRA-99-047, “D.C. Cook Units 1 & 2 Steam Releases for Radiological Dose Calculation”, Rev. 0.

7.26 Calculation TH-00-03, “D. C. Cook Unit 2 Steam Generator Tube Rupture with Operator Actions”, Rev. 0.

7.27 Calculation SD-990618-003, “Containment Net Free Volume”, Revision 2.

7.28 Calculation MD-1-SGRP-022-N, “Cook RSG – Licensing Data for FTI B&W Replacement Steam Generators (B&W Calculation No. 222-7803-A19, Rev. 2)”, Rev. 0.

7.29 Calculation MD-12-CTS-118-N, “Containment Spray System and Recirculation Sump Minimum and Maximum pH”, Rev. 4.

7.30 Design Information Transmittal DIT SGRP 99035-00 Rev. 0, “Reactor Coolant System Volumes”, November 2, 1999.

7.31 Design Information Transmittal DIT-B-01399-01, “Unit 1 SGTR Supplemental Analyses Input Assumptions”, October 25, 2000.

7.32 Design Information Transmittal DIT-SGRP-00064-00, ”Unit 2 Steam Generator Design Moisture Carryover”, June 30, 2000.

7.33 DB-12-HVCR, “Design Basis Document for the Control Room Ventilation System”, Rev. 7.

7.34 Calculation MD-12-HV-017-N, “Establish outside airflow rates for normal air conditioning system and the pressurization system for the control room”, Rev. 2.

7.35 Specification ES-CIV-0306-QCN, "Containment Isolation System Licensing/Design Bases Requirements", Rev. 1, Change Sheet 1.

7.36 Westinghouse Letter Report AEP-88-331, "Radiation Analysis Manual, D. C. Cook Units 1 and 2", July 26, 1988.

7.37 D. C. Cook Unit 1 Technical Requirements Manual (TRM), Rev. 64.

7.38 D. C. Cook Unit 2 Technical Requirements Manual (TRM), Rev. 65.

7.39 Westinghouse Letter Report AEP-99-277, "Safety Evaluation SECL 99-076 Revision 2 – Containment Modifications Evaluation", August 27, 1999.

7.40 Design Information Transmittal DIT-B-03557-00, "Core Source Term Input for Dose Reanalysis Effort", October 14, 2013.

7.41 Design Information Transmittal DIT-B-03559-00, "RCS Source Term Input for Dose Reanalysis Effort", October 15, 2013.

7.42 Design Information Transmittal DIT-B-03594-00, "Miscellaneous Input for Dose Reanalysis Effort (Contract #01559762)", May 9, 2014.

7.43 USNRC Standard Review Plan NUREG-0800, Section 6.5.2 "Containment Spray as a Fission Product Cleanup System", Rev. 4.

7.44 Design Information Transmittal DIT-B-03594-01, "Miscellaneous Input for Dose Reanalysis Effort (Contract #01559762) – Corrected Lower Compartment Gas Phase Mass Transfer Coefficient", June 4, 2014.

7.45 Drawing OP-1-5144-51, "Flow Diagram, Containment Spray, Unit No. 1".

7.46 Vendor Technical Document VTD-BAWI-0015, "Babcock & Wilcox Canada, Operating and Maintenance Manual for Unit 1 Replacement Steam Generators, PUB. #222-7803-O&M-1".

7.47 Procedure 1-OHP-4023-E-0, "Reactor Trip or Safety Injection", Rev. 38.

7.48 Engineering Evaluation EE-2005-0139, "Steam Generator Safety Valves", Revision 0.

7.49 Engineering Change EC-0000051727, "Unit 1 Cycle 25 Core Reload", Rev. 0.

7.50 Engineering Change EC-0000052225, "Unit 2 Cycle 21 Core Reload", Rev. 0.

7.51 D. C. Cook Unit 1 Technical Specifications Bases, Page Revision Date 06/01/05.

7.52 D. C. Cook Unit 2 Technical Specifications Bases, Page Revision Date 06/01/05.

7.53 Design Information Transmittal DIT-B-03594-02, "Miscellaneous Input for Dose Reanalysis Effort (Contract #01559762) – Revised CREV and HFAEV Filter Efficiency Inputs", July 11, 2014.

7.54 Design Information Transmittal DIT-B-03680-00, "Steam Generator Tube Recovery Time for Alternative Source Term Dose Effort (Contract #01576001)", February 4, 2016.

7.55 Calculation TH-00-06, "D. C. Cook Unit 1 Steam Generator Tube Rupture with Operator Actions", Rev 0.

Attachment A – Radiological Analysis Input Parameters

Item No.	Parameter	Value	Units	Reference	Comments
Group A – Core Source Term Inputs					
A.1	Licensed Core Power	Unit 1 – 3304 Unit 2 – 3468	Mwt	Ref. 7.2, Section 2.C(1) Ref. 7.3, Section 2.C(1)	A single source term which conservatively bounds both units will be developed. Therefore, the higher Unit 2 core power should be applied.
A.2	Thermal Power Measurement Uncertainty	0.34	%	Ref. 7.7 Section 3.1.1 (Unit 1) Ref. 7.8 & 7.9 (Unit 2)	Power level uncertainty is added to the licensed core power as required by Section 3.1 of Reference 7.1. This value accounts for uncertainties due to power level instrumentation and is consistent with the value used to meet the requirements of 10CFR50 Appendix K per Footnote 8 of the same reference.
A.3	No. of Assemblies in Core	193		Ref. 7.4 & 7.5, Section 4.2.1	
A.4	Maximum uranium mass per assembly	498	kg	Ref. 7.40, Item #1	Maximum value based upon Unit 1 15x15 Upgrade fuel assembly with 100% theoretical density plus 5% uncertainty.
A.5	Expected range of initial fuel enrichments	0.74 – 5.00	w/o U-235	Ref. 7.40, Item #2	
A.6	Core Average Burnup	43,000	MWd/MTU	Ref. 7.40, Item #3	This value is based upon a maximum projected burnup for the Unit 2, Cycle 20 core design plus 10% for conservatism.
A.7	Fuel rod peaking factor limit	1.65		Ref. 7.40, Item #4	This peaking factor is based upon the historical Unit 2 Nuclear Enthalpy Rise Hot Channel Factor ($F^N_{\Delta H}$) plus 4% measurement uncertainty.
A.8	Assembly radial peaking factor limit	1.65		Ref. 7.40, Item #5	Conservatively set to the rod peaking factor limit.
A.9	Number of rods in the core which exceed 6.3 kw/ft above 54 GWD/MTU	150 rods in up to two fuel assemblies		Assumed	This parameter serves as a limit on the number of fuel rods which exceed the burnup limits of Footnote 11 of Reference 7.1 and the number of fuel assemblies which can contain these rods. These values are considered to provide margin for future core designs.
Group B – RCS Source Term Inputs					
B.1	Percentage of fuel rods with cladding defects	1	%	Ref. 7.36, Table 4-1	
B.2	RCS Volume - Total RCS Volume - Pressurizer Volume	 Unit 1 – 12,535.4 max 12,204.6 min Unit 2 – 12,472.8 max 12,144.3 min Unit 1 – 1834.4 Unit 2 – 1800.0	ft^3	Ref. 7.30	From Note 1 of Reference 7.30, these values represent 'cold' conditions. The RCS volumes include the volume of the pressurizer. From Note 10, minimum RCS volumes reflect 10% steam generator tube plugging. Note 4 of Reference 7.30 indicates that 'hot' volumes can be obtained by applying a hot volume expansion factor of 3% to the cold values. A minimum RCS inventory should be used to represent the RCS compartment in the dose analysis events which involve fuel failures to maximize the radionuclide concentrations. A maximum RCS volume should be applied in the calculation of the iodine appearance rates for the MSLB and SGTR events.

Item No.	Parameter	Value	Units	Reference	Comments
B.3	RCS Average Temperature - Full Power Operation - Zero Load	 Unit 1 – 571.0 Unit 2 – 574.0 547.0	°F	 Ref. 7.41, Item #1 Ref. 7.17 & 7.18, Section III.A	RCS temperature and pressure are used to obtain a fluid density for volume-mass units conversion.
B.4	RCS Normal Operating Pressure	2250	psia	Ref. 7.41, Item #2	RCS temperature and pressure are used to obtain the fluid density for volume-mass units conversion.
B.5	Nominal Mixed Bed Demineralizer Flow Rate	75	gpm	Ref. 7.41, Item #6	This value is equal to the nominal letdown flow rate
B.6	Nominal Cation Bed Demineralizer Flow Rate	800	gal/day	Ref. 7.41, Item #7	Approximate value since the cation bed usage varies with time of core life and other RCS chemistry considerations. A smaller value conservatively removes less Rb-86, Cs-134, and Cs-137 from the reactor coolant.
B.7	Effective Boron Removal Makeup Flow Rate	400	gal/day	Ref. 7.41, Item #8	Nominal makeup flow will vary from zero gpd at the beginning of cycle to several thousand gpd near the end of cycle when boron concentrations are low. A smaller value is conservative since this parameter directly dilutes the radionuclide concentrations in the RCS.
B.8	Letdown Flow Rate - Normal - Maximum	 75 120	gpm	Ref. 7.41, Item #3	The normal letdown flow rate applies to the derivation of the RCS source term. The maximum letdown flow rate should be applied in the development of the iodine appearance rates and releases from a ruptured VCT.
B.9	Letdown Fluid Temperature/Pressure	120 365	°F psia	Ref. 7.41, Item #4 and #5	These values are used for units conversion and should correspond to fluid conditions near the location of flow measurement instrumentation.
B.10	Fission Product Escape Rate Coefficients - Kr, Xe Isotopes - I, Br, Rb, Cs Isotopes - Mo, Tc, Ag Isotopes - Te Isotopes - Sr, Ba Isotopes - Y, Zr, Nb, Ru, Rh, La, Ce, Pr Isotopes	 6.5E-08 1.3E-08 2.0E-09 1.0E-09 1.0E-11 1.6E-12	sec^{-1}	Ref. 7.36, Table 4-1	Values correspond to full power operation
B.11	VCT Noble Gas Stripping Fractions - Kr-85m - Kr-85 - Kr-87 - Kr-88 - Xe-131m - Xe-133m - Xe-133 - Xe-135m - Xe-135 - Xe-137 -Xe-138	 0.61 7.3E-05 0.84 0.71 0.017 0.085 0.037 0.95 0.35 0.98 0.95	fraction	Ref. 7.36, Table 4-3	Table 4-3 of Reference 7.30 states that these stripping fractions are based upon no purge flow from the Volume Control Tank (VCT).

Item No.	Parameter	Value	Units	Reference	Comments
B.12	Demineralizer Decontamination Factors Mixed Bed: - Noble Gases (Kr, Xe Isotopes) - I, Br Isotopes - Sr, Ba Isotopes - All Other Isotopes Cation Bed: - Noble Gases (Kr, Xe Isotopes) - Sr, Ba Isotopes - Rb-86, Cs-134, Cs-137 - Rb-88, Rb-89, Cs-136, Cs-138 - All Other Isotopes	 1 10 10 1 1 1 10 1 1	unitless	Ref. 7.36, Table 4-3	
B.13	RCS Leakage - Identified - Unidentified	 10.0 1.0	gpm	Ref. 7.4 & 7.5, Section 3.4.13	The unidentified leakage rate limit of 0.8 gpm from References 7.4 and 7.5 applies to leakage from the pressurizer surge line. The higher value 1.0 gpm for leakage from other sources given in the Action Statement of the same specification is more conservative. Primary coolant leakage is used in the calculation of iodine appearance rates.
B.14	RCS Specific Activity Limits - Nominal – Dose Equivalent I-131 - Normal – Gross Specific - Maximum Full Power Operation - Dose Equivalent I-131	 1.0 DE I-131 100/E-bar 60.0	μCi/gm	Ref. 7.4 & 7.5, Section 3.4.16 Ref. 7.4 & 7.5, Figure 3.4.16-1	E-bar is defined in Section 1 of References 7.4 and 7.5 as the sum of the nuclide weighted average decay energy for non-iodine isotopes with half lives greater than 15 minutes. The RCS source term should meet both the 100/E-bar and specific iodine activity limits. Noble gas activities from the RCS source term can be used to derive a corresponding Dose Equivalent Xe-133 value to support a future Technical Specification RCS activity limit.
Group C – Containment Inputs					
C.1	Containment Volume - Upper Containment (Sprayed) - Lower Containment (Sprayed) - Lower Containment Fan Room (Sprayed) - Upper Containment (Unsprayed) - Ice Condenser (Unsprayed) - Lower Containment (Unsprayed) - Lower Containment Dead-Ended (Unsprayed)	 609,773 101,735 47,954 120,196 103,507 64,890 18,297	ft^3	Ref. 7.21, Tables 5.2.5.1 & 5.4.4.1 Ref. 7.22	In general, Reference 7.21 produces best-estimate compartment volumes that are biased low due to the net free volume inputs from Reference 7.27. Smaller volumes will tend to produce higher radionuclide concentrations and higher activity release rates from containment. In addition, since Section 3.3 of Appendix A to Reference 7.1 directs calculating the natural convection mixing rate between sprayed and unsprayed regions based upon the size of the unsprayed volumes, smaller compartment volumes conservatively minimizes the containment internal mixing. However, larger volumes reduce spray effectiveness and result in lower iodine removal coefficients. Note that values from Tables 5.2.5.1 and 5.4.4.1 of Reference 7.21 do not include the additional reductions due to rounding that are performed in Section 6 of this same reference as discussed in Reference 7.22.

Item No.	Parameter	Value	Units	Reference	Comments
C.2	Containment Sump Volume	50,955	ft^3	Ref. 7.42, Item #1	This value represents the minimum sump volume at the time of switchover to recirculation, which conservatively maximizes the radionuclide concentration for the ESF leakage outside of containment.
C.3	Containment Wall Surface Deposition Area	0	ft^2	Assumed	From the guidance of Section III.4.C.i of Reference [7.43], setting the wall deposition area to zero will cause the elemental iodine removal by deposition onto sprayed surfaces to be conservatively ignored.
C.4	CEQ Flow Rates From Upper Containment From Top of Containment Dome From Steam Generator Compartments From PZR Compartment From Fan Rooms From Instrumentation Room	 39,000 1,000 1,000 500 200 100	cfm	Ref. 7.10 & 7.11	Values represent design flow rates for single train fan operation (HV-CEQ-1 or HV-CEQ-2). Lower flow rates will conservatively minimize containment mixing which reduces iodine removal by containment sprays. Section 4.19 of Reference 7.27 identifies that the Instrumentation Room is included in the Dead-End volume. Similarly, Sections 4.10 and 4.11 of Reference 7.27 identify Volume IX and X as the Steam Generator and Pressurizer cubicles, respectively. Table 5.3.3.1 of Reference 7.21 shows that compartments IX and X are included in the development of the Lower Containment Net Free Volume, which is used to calculate the size of the Lower Containment Unsprayed Volume in Equation 5.4.3 of the same reference.
C.5	CEQ Fan Start Time	300	seconds	Ref. 7.42, Item #3	The response time includes actuation signal processing, EDG startup, and fan start.
C.6	Containment Leak Rate	0.18	Weight %/day	Ref. 7.42, Item #2	This value represents a reduction from the current Tech. Spec. leak rate limit of 0.25%/day. Use of a value less than 0.25% in the dose analysis requires a change to Section 5.5.14.c of the Technical Specifications (Ref. 7.4 & 7.5) per Section 3.7 of Appendix A to Ref. 7.1.
C.7	Containment Purge Isolation Valve Stroke Time	5	seconds	Ref. 7.35, pages C5 & D5 Ref. 7.10 & 7.11 Ref. 7.4 & 7.5, Table 3.3.6-1, Item #4 Ref. 7.51 & 7.52, Section B.3.3.6	The Containment Purge Supply and Exhaust System isolation initiates on an automatic Safety Injection Signal.
C.8	Containment Purge Exhaust Flow Rate	33,000	cfm	Ref. 7.10 & 7.11	This value represents the design flow rate for two fan Containment Purge Exhaust fans (HV-CPX-1 & HV-CPX-2) at 16,000 cfm per fan plus the Instrument Room Exhaust fan (HV-CPX-1) at 1000 cfm. Maximum purge flow is conservative.
C.9	Containment Spray Start Time	300	seconds	Ref. 7.42, Item #4	Value includes EDG start, sequencer delays, pump acceleration, and pipe fill times.
C.10	Containment Spray Stop Time - Duration sprays are secured for pump suction realignment for recirculation - Time in event after which sprays are secured	 7 24 hours	 minutes hours	Ref. 7.42, Item #5	Iodine removal by containment sprays is not applicable when containment spray is secured. Natural deposition of aerosols is not applicable when sprays are active.
C.11	Mass Mean Diameter of Spray Drops	- Lower Compartment - 671 - Upper Compartment - 609	μm	Ref. 7.42, Item #6	This parameter is used in the calculation of the elemental iodine spray removal coefficient.

Item No.	Parameter	Value	Units	Reference	Comments
C.12	Containment Spray Flow Rate - Upper Containment - Lower Containment - Fan Rooms	 1,466 660 201	gpm	Ref. 7.42, Item #7	This parameter is used in the calculation of the elemental and aerosol iodine spray removal coefficients. Minimum spray flow rates conservatively minimize the removal coefficients.
C.13	Spray Drop Fall Height - Upper Containment - Lower Containment - Fan Rooms	 58.6 28.5 20.1	ft	Ref. 7.21, Table 6.3 Ref. 7.22	The spray drop fall height is used in the calculation of the aerosol iodine removal coefficient.
C.14	Spray Drop Fall Time - Upper Containment - Lower Containment - Fan Rooms	 11.9380 2.77329 1.95590	seconds	Ref. 7.42, Item #8	The spray drop fall time is used in the calculation of the elemental iodine removal coefficient. Note that these values correspond to a drop diameter of 675 μm for the lower compartment and fan rooms, and a drop diameter of 625 μm for the upper compartment.
C.15	Gas Phase Mass Transfer Coefficient, K_g - Upper Compartment - Lower Compartment	 0.113640 0.155038	m/sec	Ref. 7.42, Item #9 Ref. 7.44	This parameter is used in the calculation of the elemental iodine spray removal coefficient. These values correspond to drop diameters of 675 μm for the lower compartments and 625 for the upper compartment. Note that the coefficient for the lower compartment applies to the both the lower containment and fan room volumes.
C.16	Time of ECCS Switchover to Recirculation	1,388.4	seconds	Ref. 7.39, Section 3.3.1.2.1 & Table 3.3-1	This value corresponds to the start of the first the RHR/CTS pump after suction transfer to the containment sump, and represents the maximum RWST drain-down case with two ECCS trains in operation and a 3-minute interruption in RHR/CTS flow. Minimum switchover time increases the amount of ESF leakage outside of containment.
C.17	Sump pH at Time of Spray Recirculation	≥7.0		Ref. 7.29, Page 71, Item 2.	The Spray Additive system provides a containment sump pH greater than or equal to 7.0 after the containment spray is transferred to recirculation. This is required by Reference 7.43, Section II – SRP Acceptance Criteria 1.G to ensure long term iodine retention in the sump solution.
Group D – Control Room Inputs					
D.1	Control Room Volume	50,616	ft^3	Ref. 7.23, p. 16	Reference 7.23 refers to this value for the control room volume as the minimum verifiable free volume. A smaller control room volume has competing effects of higher radionuclide concentrations and increased removal by the control room filters. The sensitivity of the dose consequences to small changes in volume is negligible.
D.2	Control Room Ventilation System (CRVS) Normal Makeup Flow Rate	880	cfm	Ref. 7.13 & 7.14 Ref. 7.34, Section 2.7	The design makeup rate is shown in References 7.13 & 7.14 as 800 cfm, with a normal expected operating range from Reference 7.34 of 720 – 880 cfm. Use of a maximum outside makeup flow rate is conservative. This flow enters the control room envelope at the suction of the air handler units HV-ACRA-1 and HV-ACRA-2.

Item No.	Parameter	Value	Units	Reference	Comments
D.3	Control Room Emergency Ventilation (CREV) Actuation Signals	SI input from either unit		Ref. 7.4 & 7.5, Table 3.3.7-1	
D.4	CREV System Response Time	60	seconds	Ref. 7.33, Sections 3.3.2, 3.3.4 & 3.7.2 Ref. 7.4 & 7.5, SR 3.8.1.8 Ref. 7.6, Section 8.4	The response time includes actuation signal processing, EDG startup, fan start, damper realignment. Following a LOOP, the EDGs start and are ready to load in 10 seconds. CRVS components are powered by 600 V electrical distribution system which is sequenced onto the safety bus in the first load block, nominally at 10 seconds. The 60 second CREV response time includes margin to address additional delay time components.
D.5	CREV Pressurization/Cleanup Flow Rates - Filtered Makeup - Total System Flow	 720-880 5400 - 6600	cfm	 Ref. 7.13 & 7.14 Ref. 7.34, Section 2.7 Ref. 7.47, Attachment A, Step 10 Ref. 7.4 & 7.5, Section 5.5.9	The design filtered makeup flow is 800 cfm with an uncertainty of +/-10%. Maximum makeup flow is conservative for this analysis. This flow enters the control room envelope at the suction of the pressurization/cleanup filter system fan (HV-ACRF-1 or HV-ACRF-2). The total flow rate of 5400 – 6600 cfm represents single fan operation. A minimum recirculation flow rate reduces the radionuclide removal by the control room filters in the event dose analyses. A maximum flow rate maximizes the activity on the control room filters in the shine dose analysis. Reference 7.47 states that following system actuation, one of the two fans is secured. This is done to keep air velocities through the charcoal adsorbers low enough to ensure a minimum iodine residence time.
D.6	Control Room Unfiltered Inleakage	40	cfm	Ref. 7.42, Item #10	
D.7	CREV Filter Efficiency - Elemental - Organic - Particulate	 95 95 99	%	Ref. 7.53, Item #11	
D.8	Maximum CREV Filter Bypass Fraction	1	%	Ref. 7.4 & 7.5, Section 5.5.9	The filter bypass fraction is based upon the HEPA removal efficiency requirement from References 7.4 & 7.5 and is considered separately from the filter efficiencies.
Group E – Steam Generator Inputs					
E.1	Secondary Specific Activity	0.10	μCi/gm DE I-131	Ref. 7.4 & 7.5, Section 3.7.17	
E.2	Primary-to-Secondary Leak Rate Accident Leakage	 1.0 0.25	 gpm to all SGs gpm to any 1 SG	Ref. 7.42, Item #12	Section 5.1 of Appendix E to Reference 7.1 requires that the primary-to-secondary leakage be apportioned between steam generators in such a manner that maximizes the calculated dose. Use of a single steam generator leakage rate in the dose analysis requires a change to Section 5.5.7.b.2 of the Technical Specifications (Ref. 7.4 & 7.5).

Item No.	Parameter	Value	Units	Reference	Comments
E.3	Temperature of the fluid used to assess RCS leakage by the leak rate monitoring program	70	°F	Ref. 7.19, Section 2	Reference 7.1, Appendix E, Section 5.2 requires that the density used in converting volumetric leak rates to mass leak rates be consistent with the surveillance tests and facility instrumentation used to show compliance with leak rate technical specifications.
E.4	Steam Generator Secondary Side Liquid Mass - Minimum - Maximum	 97,515.7 161,000	 lbm/SG lbm/SG	 Ref. 7.25, p. 16 Ref. 7.25, p. 32	The minimum steam generator liquid mass represents Hot Full Power (HFP) conditions, while the maximum value is conservatively based upon Hot Zero Power (HZP) conditions. The minimum mass is used in combination with primary-secondary leakage rates to maximize the radionuclide concentrations in the steam generators. The maximum mass is used in the release of iodine initially present in the SG secondary.
E.5	Time to cool the RCS to 212 °F and terminate steam releases	24	hr	Ref. 7.42, Item #13	Reference 7.1, Appendix E, Section 5.3 requires that primary-to-secondary leakage be assumed to continue until the RCS is cooled to 212 °F, and radioactive releases should continue until shutdown cooling is in operation and releases from the steam generators have been terminated. The 24-hour cooldown time is based upon a single train of RHR in service.
E.6	SG Moisture Carryover Fraction	Unit 1 - 0.045 Unit 2 - 0.15	%	Ref. 7.46, Section 8.2.1 (Unit 1) Ref. 7.32 (Unit 2)	This value is used to limit particulate retention in the steam generators per Appendix. E, Section 5.5.4 of Reference 7.1.
E.7	SGTR break flow/tube leakage flashing fractions			Ref. 7.26, – Pages 42 - 44	The fraction of the primary fluid which flashes to vapor on the secondary side of the steam generators is assumed to be released to the environment with no partitioning in the steam generators. The Unit 2 flashed break flow from Reference 7.26 exceeds the Unit 1 value from Reference 7.55. Consequently, Unit 2 inputs are applied to produce bounding flashing fractions.
E.8	Duration of intact SG tube bundle uncovered following a reactor trip?	40	minutes	Ref. 7.54	Following a reactor trip, redistribution of fluid in the SG secondary causes the water level inside the wrapper to drop below the top of the tubes until level is recovered by AFW. During periods of tube uncovery, primary-secondary leakage is assumed to be released to the environment with no partitioning in the steam generators.
Group F – RWST Inputs					
F.1	RWST Total Volume	420,000	gallons	Ref. 7.45	
F.2	Minimum operable RWST Liquid Volume	375,500	gallons	Ref. 7.4 & Ref. 7.5, Section 3.5.4	
F.3	Maximum delivered RWST volume at time of switchover to recirculation	321,862.5	gallons	Ref. 7.39, Sect. 3.3.1.2.1 and Table 3.3-1	This is the maximum volume delivered from the RWST from the beginning of the event until after the switchover from injection to recirculation is complete, and is used to determine the minimum remaining RWST inventory at the time of switchover.
F.4	Maximum RWST temperature	100	°F	Ref. 7.4 & Ref. 7.5, Section 3.5.4	
F.5	Minimum RWST pH	4.479		Ref. 7.29, Appendix 4.1	This value corresponds to the maximum RWST boron concentration of 2600 ppm from Section 3.5.4 of Ref. 7.4 & Ref. 7.5.

Item No.	Parameter	Value	Units	Reference	Comments
Group G.1 – Event Specific Inputs - LOCA					
G.1.1	Engineered Safeguards Features (ESF) system leakage limit into the Auxiliary Building	0.1	gpm	Ref. 7.20, Data Sheet 1	This value applies to all sources of ESF leakage into the Auxiliary Building, both inside and outside the ESF Ventilation system envelope. Section 5.2 of Appendix A to Reference 7.1 requires that the value of this parameter be doubled in the evaluation of the dose consequences from ESF leakage.
G.1.2	Engineered Safeguards Features (ESF) system leakage limit to the RWST	0.5	gpm	Assumed	This values serves as a limit on the total ESF seat leakage past isolation valves on lines which recirculate sump fluid back to the RWST. This parameter is required to be doubled in the dose analysis per Section 5.2 of Appendix A to Reference 7.1.
G.1.3	Containment Sump Temperature Profile	Figure A1		Ref. 7.6, Unit 1, Figure 14.3.4-9	Maximum sump temperatures conservatively maximize the flashing fraction of ESF fluid leakage outside of containment. In addition, higher sump fluid temperatures reduce the iodine partition coefficient of sump fluid in the RWST. The profile from Reference 7.6 is considered to be representative of post-LOCA sump conditions. A bounding temperature envelope based upon this profile will provide for future analytical margin.
G.1.4	Status of Aux. Bldg HVAC following SI/LOOP	ESF Ventilation - running		Ref. 7.517.32, Section B.3.7.12 (Unit 1) Ref. 7.52, Section B.3.7.12 (Unit 2)	Reference 7.12 shows that the exhaust from both the normal Auxiliary Building ventilation system and the ESF Ventilation system discharge through the unit vent.
G.1.5	Time of Safety Injection Signal	5.7	seconds	Ref. 7.6, Unit 2, Table 14.3.1-8	The SI actuation time is used to isolate containment and to initiate control room ventilation realignment. This value is considered to be representative.
G.1.6	ESF Ventilation System filter efficiencies - Elemental - Organic - Particulates	n/a	%	n/a	Omission of ESF Ventilation system filter efficiencies ensures that filtration by this system is conservatively ignored in the dose analysis
Group G.2 – Event Specific Inputs – Main Steam Line Break					
G.2.1	Fuel Failure Fraction	0		Ref. 7.49, Section 1.3.3 (Unit 1) Ref. 7.50, Section 1.4.2 (Unit 2)	Sufficient DNB margin exists to prevent fuel failures for this event.
G.2.2	Time of Safety Injection Signal	< 1	seconds	Ref. 7.6, Section 7.2.3 & Unit 2 Table 14.2.5-2	The safety injection actuation occurs on low steam line pressure. The SI time is used to initiate control room ventilation realignment. This value is considered to be representative, and the dose analysis results are not sensitive to small variances in this parameter.
G.2.3	Intact SG Steam Release - 0 - 2 hr - 2 - 8 hr - 8 - 24 hr	 456,000 1,186,000 1,347,000	lbm	Ref. 7.25, p. 7	From Sections 1.1 and 6.2 of Reference 7.25, these values are developed assuming that the RCS is cooled to 212 °F at the end of 8 hours with no credit taken for heat removal by the RHR system.

Item No.	Parameter	Value	Units	Reference	Comments
Group G.3 – Event Specific Inputs – Steam Generator Tube Rupture					
G.3.1	Fuel Failure Fraction	0		Ref. 7.49, Section 1.3.3 (Unit 1) Ref. 7.50, Section 1.4.2 (Unit 2)	Sufficient DNB margin exists to prevent fuel failures for this event.
G.3.2	Ruptured Tube Break Flow	146,704	lbm	Ref. 7.24, p. 46	The break flow from the ruptured steam generator is based upon a release duration of 30 minutes per Sections 5.0 and 6.1 of Reference 7.24. Case 27 was chosen as it represents the most limiting value. Note that the additional 10% analytical flow margin used throughout Ref. 7.24 is not applied to this value.
G.3.3	Ruptured SG Steam Release	66,171	lbm	Ref. 7.24, p. 46	The steam flow from the ruptured steam generator is based upon a release duration of 30 minutes per Sections 5.0 and 6.1 of Reference 7.24. Case 2A was chosen as it represents the most limiting value.
G.3.4	Intact SG Steam Release - 0 - 30 min - 30 min - 2 hr - 2 - 8 hr - 8 - 24 hr	 0.75 x 264,686 = 198,515 314,432 1,367,475 1,347,000	lbm	 Ref. 7.24, p. 58 Ref. 7.24, p. 49 Ref. 7.24, p. 54 Ref. 7.24, p. 55	From Sections 3.1 and 6.3.3 of Reference 7.24, these values are developed assuming that the RCS is cooled to 212 °F at the end of 8 hours and no credit for heat removal by the RHR system
G.3.5	Condenser Iodine Partition Coefficient	100	-	Ref. 7.24, Section 6.3.4	
G.3.6	Full Power Main Steam Flow Rate	17,153,800	lbm/hr	Ref. 7.48, Page 8	This value represents 105% of the maximum secondary steam flow rate at 100% rated thermal power.
G.3.7	Time of Reactor Trip	101	seconds	Ref. 7.26, Section 6.3.2	An early trip time is conservative since the additional iodine partitioning by the condenser prior to reactor trip more than offsets the higher pre-trip break flow flashing fraction.
G.3.8	Time of Safety Injection	334.74	seconds	Ref. 7.24, Appendix A, Cases 25 & 25a	This is the maximum value of SI initiation time from all SGTRH cases presented in Appendix A of Reference 7.24. The SI actuation time is used to initiate control room ventilation realignment.
Group G.4 – Event Specific Inputs – Control Rod Ejection					
G.4.1	Fraction of Fuel Rods with Cladding Damage	10	%	Ref. 7.42, Item #16	
G.4.2	Fraction of Core that Experiences Melting	0.25	%	Ref. 7.42, Item #17	
G.4.3	Time of Safety Injection Signal	60	seconds	Ref. 7.6, Unit 1 Section 14.2.6.17 & Unit 2, Section 14.2.6.2.9	This is an approximate value based upon the discussion in Reference 7.6. The SI actuation time is used to initiate control room ventilation realignment, and the dose analysis results are not sensitive to small changes in this parameter.
Group G.5 – Event Specific Inputs – Locked Rotor					
G.5.1	Fuel Failure Fraction	11	%	Ref. 7.42, Item #18	
G.5.2	Steam release during plant cooldown - 0 - 2 hr - 2 - 8 hr - 8 - 24 hr	 460,000 1,256,000 1,347,000	lbm	Ref. 7.25, p. 6	From Sections 1.1 and 6.2 of Reference 7.25, these values are developed assuming that the RCS is cooled to 212 °F at the end of 8 hours with no credit taken for heat removal by the RHR system.

Item No.	Parameter	Value	Units	Reference	Comments
G.5.3	Time CR ventilation is manually aligned	20	minutes	Ref. 7.42, Item #19	
Group G.6 – Event Specific Inputs – Fuel Handling Accident					
G.6.1	Fraction of rods in dropped assembly that fail	100	%	Ref. 7.6, Unit 1,Section 14.2.1.4	Reference 7.6 supports the conservative assumption that 100% of the fuel rods in the dropped assembly fail.
G.6.2	Depth of water above the fuel assemblies	≥23	ft	Ref. 7.4 & 7.5, Section 3.7.14 & 3.9.6	
G.6.3	Time CR ventilation is manually aligned	20	minutes	Ref. 7.42, Item #20	This is a conservatively long length of time considering that direct communication between the control room and the refueling stations is required by Section 8.9.1 of References 7.37and7.38.
G.6.4	Fuel movement time after reactor shutdown	120	hr	Ref. 7.37 & 7.38, Section 8.9.2	Minimum wait period after reactor shutdown before irradiated fuel can be moved
G.6.5	Status of FHAEV system during refueling operations	One train operable and in Operation		Ref. 7.4 & 7.5, Section 3.7.13	
G.6.6	FHAEV System filter efficiencies - Elemental - Organic - Particulates	 90 90 99	%	Ref. 7.53, Item #21	
G.6.7	Maximum FHAEV Filter Bypass Fraction	1	%	Ref. 7.4 & 7.5, Section 5.5.9.a	The filter bypass fraction is based upon the HEPA removal efficiency requirement from References 7.4 & 7.5 and is considered separately from the filter efficiencies.
G.6.8	Status of building openings during irradiated fuel movement - Containment - Auxiliary building	 Open Closed		 Ref. 7.4 & 7.5, Section 3.9.3 & Bases Ref. 7.4 & 7.5, Section 3.7.13 & Bases	Sections 4.3 and 4.4 of References 7.15 and 7.16 establish integrity of the containment and Auxiliary Building during movement of irradiated fuel. Both containment airlock doors are permitted to be open simultaneously provided that they can be closed subsequent to a containment evacuation. The Auxiliary Building doors must be closed to ensure operability of the FHAEV system. Administrative controls which permit breaching these doors requires a dedicated individual in continuous communication with the control room who has the means to rapidly close the opening.
Group G.7 – Event Specific Inputs – Waste Gas Decay Tank Rupture					
G.7.1	WGDT Inventory Limit	43,800	Curies DE Xe-133	Ref. 7.37 & 7.38, Section 8.7.13	
Group G.8 – Event Specific Inputs – VCT Failure					
G.8.1	VCT Liquid Volume	267	ft^3	Ref. 7.36, Table 4-3	
G.8.2	VCT Vapor Volume	133	ft^3	Ref. 7.36, Table 4-3	
G.8.3	Time to isolate the ruptured tank	15	minutes	Ref. 7.6, Section 14.2.3.1	

Group H – Atmospheric Dispersion Factor Inputs				
H.1	Receptor Locations	Unit 1 Normal Control Room Intake Unit 2 Normal Control Room Intake Unit 1 Emergency Control Room Intake Unit 2 Emergency Control Room Intake	Onsite atmospheric dispersion factors (X/Q) are calculated from all release points to intakes for both units.	Plant parameters used in the development of the atmospheric dispersion factors include release height, receptor height, and coordinates which allow the determination of the distances and directions between the release-receptor pairs.
H.2	Release Locations	Unit 1 Containment Surface (Diffuse) Unit 2 Containment Surface (Diffuse)	A diffuse X/Q from the containment surface is generated for use in the analysis of the LOCA containment leakage onsite dose.	
		Unit 1 Containment Surface (Offsite) Unit 2 Containment Surface (Offsite)	Limiting X/Qs from the containment surface to the EAB and LPZ locations are needed for the containment leakage offsite dose.	
		Unit 1 Containment Closest Point (Onsite) Unit 2 Containment Closest Point (Onsite)	The location on the containment building surface which is closest to the intakes provides X/Qs that are more limiting that the release from any specific containment penetration. This atmospheric dispersion factor is applicable to a Fuel Handling Accident (FHA) inside containment.	
		Unit 1 West MSSVs//PORVs Unit 2 West MSSVs/PORVs	MSSV/PORV releases apply to all events which involve secondary releases.	
		Unit 1 Steam Jet Air Ejectors Unit 2 Steam Jet Air Ejectors	Releases from the SJAEs apply to the Steam Generator Tube Rupture (SGTR) event prior to reactor trip.	
		Unit 1 Plant Vent Unit 2 Plant Vent	The plant vent release point is credited when safety related Auxiliary Building ventilation is available. This includes the LOCA containment purge, FHA inside the Aux. Building, and LOCA ESF leakage in the ESF Ventilation envelope.	
		Unit 1 East Turbine Building Closet Point Unit 2 East Turbine Building Closet Point Unit 1 West Main Steam Enclosure Unit 2 West Main Steam Enclosure	Releases from the east side of the Turbine Building and from the West Main Steam Enclosure are considered for the faulted steam generator during the Main Steamline Break (MSLB) event.	
		Aux. Building – North Intake Aux. Building – South Intake	Auxiliary Building normal ventilation intakes may serve as release points for tank ruptures when the building ventilation is not in service.	
		Unit 1 RWST Unit 2 RWST	RWST releases apply to LOCA ESF seat leakage through isolated lines which recirculate to the RWST.	
		Unit 1 East Main Steam Enclosure (Offsite) Unit 2 East Main Steam Enclosure (Offsite) Turbine Building – NW Corner (Offsite) Turbine Building – SW Corner (Offsite)	East Main Steam Enclosure and West Turbine Building atmospheric dispersion factors are needed for EAB and LPZ locations only since the west steam enclosure and east turbine building locations are more limiting with respect to onsite receptors.	

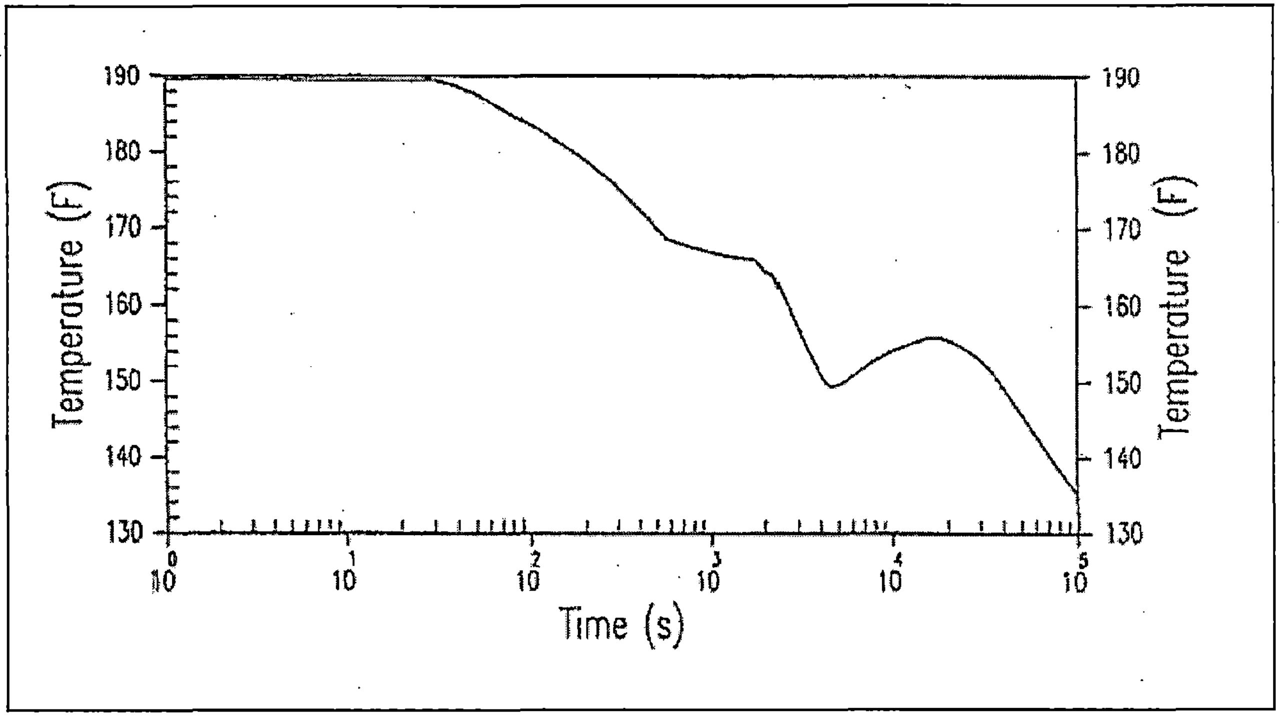

Figure A1: Containment Sump Temperature Profile

Attachment B

Owner's Review Comments

Revision 0

AEP Comments for RWA-1313-001			RWA Response	AEP Acceptance/Additional Comments
Comment No.	Document Location	Description		
1	Page 1	Update page numbers.	Page numbering has been updated.	Acceptable. JJW-7/11/2014
2	Page 3, Methodology	Could the practice of not listing the parameter as it is used in the calculation be considered a future error likely situation?	RWA-1313-001 is created specifically to serve as a front-end input document to be referenced by the dose event calculations. This is clearly stated in both the Purpose and Methodology sections of the document. Future misuse of this calculation will require the user to ignore the stated intent of the document. However, while the 'Comments' column of the calculation is included to provide perspective on how some parameters are to be used in the dose analysis, some of the text in this column does imply a 'past tense' use of the listed value. Therefore, minor text changes have been made to project a more 'future tense' in the comments section. Note that calculation RWA-1313-015 will be prepared at conclusion of the project which summarizes the actual analysis values.	Acceptable. JJW-7/11/2014
3	Page 4-6, References	The UFSAR and DB-12-XX documents (References 6.6, 6.32, 6.33, and 6.34) are not typically utilized as design input unless deemed appropriate. Alternate references should be used in their place.	Alternate references have been provided where available. The UFSAR and DBDs continue to be cited in the following cases: Item D.2 - DB-12-HVCR is used to document that the CREV dampers are powered from the 600 Vac Electrical Distribution System and are designed to close following a LOCA. UFSAR Section 8.4 identifies that the 600 volt buses are powered from the emergency diesel generators and are loaded onto the diesel in the first load block within 10 seconds. Item G.1.3 - The containment sump temperature profile in Figure 14.3.4-9 if the Unit 1 FSAR is identified as being representative. A bounding temperature envelope will be applied in the analysis to create analytical margin. Item G.1.5 - The timing of the SI signal for the LOCA listed in the FSAR is considered to be representative, and the dose analysis is not sensitive to small changes in this parameter. The value from the FSAR is adjusted in the analysis for future design margin. Item G.2.2 - The timing of the SI signal for the MSLB listed in the FSAR is considered to be representative, and the dose analysis is not sensitive to small changes in this parameter. The value from the FSAR is adjusted in the analysis for future design margin.	Acceptable. The input values associated with these references are deemed to be appropriate and conservatism has been applied when necessary. JJW-7/11/2014

			Item G.4.3 - The exact timing of the SI signal for the CRE event is not specified in the FSAR. The FSAR discussion states that ECCS is actuated 'within one minute' after the break, indicating that this value is representative. The dose analysis is not sensitive to small changes in this parameter, and the 60 second actuation time is conservatively combined with a 60 second delay time in the analysis. Item G.6.1 - The FSAR supports the conservative assumption that 100% of the rods in the dropped fuel assembly are assumed to fail.	
4	General Input	Any time Reference 6.21 (PRA-DOSE-011) is listed, the justification report prepared by RWA should be listed as well.	Letter Report RWA-L-1313-002 has been added to the reference list and is cited along with Reference 6.21 in the calculation.	Acceptable. JJW-7/11/2014
5	Page A1, Item A.1	The reference should be listed as 6.2 Section 2.C(1) instead of Section 6.1.	The link to Reference 6.2 has been corrected.	Acceptable. JJW-7/11/2014
6	Page A3, Item B.14	Please state the purpose of deriving a corresponding value for Xe-133.	Discussion of XE-133 is not relevant to this item and reference to it may be removed. However, to specifically address this comment, the text has been revised to state that the DE-133 value derived from the RCS source term may be used to support a future Tech. Spec. RCS activity limit.	Acceptable. JJW-7/11/2014
7	Page A4, Item C.6	Specify that a license amendment request is required for the new value.	The need for a license change has been added to the comment section.	Acceptable. JJW-7/11/2014
8	Page A5, Item C.15	The lower compartment mass transfer coefficient should correspond to a drop diameter of 675 um as opposed to 700 um.	The value of the lower compartment gas phase mass transfer coefficient has been changed to correspond to a drop diameter of 675 μm.	Acceptable. JJW-7/11/2014
9	Page A6, Item D.5	A statement is made in the comments regarding maximum flow rates maximizing the activity on the control room filters. The input values correspond to single fan operation. How sensitive is the listed value to two fan operation?	The filter shine dose methodology assumes a filter efficiency of 100% and applies this to the control room makeup flow. As such, the sensitivity of the dose to the control room recirculation flow rate is relatively weak. Use of the maximum single-fan value of 6600 cfm is appropriate since plant operators will secure one of two fans to ensure minimum iodine residence times in the filters.	Acceptable. JJW-7/11/2014
10	Page A6, Item E.2	Specify that a license amendment request is required for the new value.	The need for a license change has been added to the comment section.	Acceptable. JJW-7/11/2014

11	Page A7, Item F.3	What RWST level forms the basis for this parameter? It seems low.	From AEP 99-277, this parameter is based upon maximum pump flow rates, delay times for operator action to perform pump suction realignments, and a switchover time that begins when the volume of water delivered from the RWST has reached 280,000 gallons. Since the analysis in AEP 99-277 is performed to demonstrate that the minimum RWST deliverable volume requirement is satisfied, the 280,000 gallon value should be consistent with the minimum initial RWST volume allowed by Tech. Specs. In the dose analysis, the maximum transfer volume of 321,862.5 gallons is used to determine the minimum amount of RWST inventory remaining in the tank at the end of switchover. This value is obtained by subtracting 321,862.5 gallons from the Tech. Spec. minimum initial inventory of 375,500 gallons.	Acceptable. JJW-7/11/2014
12	Page A7, Items G.1.1 and G.1.2	If these values are doubled in the analysis, please say so in the comments.	The comment section has been revised to identify that Reg. Guide 1.183 requires that plant leakage limits are to be doubled in the dose analysis.	Acceptable. JJW-7/11/2014
13	Figures A1 and A3	It may be prudent to darken the part of the plot that corresponds to the RCS pressure (the SG pressure is more prominent).	Footnotes were added to Figures A1 and A3 to emphasize that the figures contain traces for both RCS and Steam Generator pressures.	Acceptable. JJW-7/11/2014
14	Figures A2 and A4	Add "Hot Leg" to the title of the figure.	Figure titles have been revised	Acceptable. JJW-7/11/2014

Revision 1

AEP Comments for RWA-1313-001, Rev. 1			RWA Response	AEP Acceptance/Additional Comments
Comment No.	Document Location	Description		
1	Page 1, "Description"	Please add a statement similar to the following... "...secondary side of the steam generators as well as clarifying information regarding the VCT rupture."	Text has been added to the description to identify that clarifying information was added to the VCT rupture inputs	Response accepted. -JJW (02/12/16)
2	Page 6, Section 6	The title of the DIT should be changed from "...Generator Recovery Time..." to "...Generator Tube Recovery Time...".	The title of the DIT has been corrected.	Response accepted. -JJW (02/12/16)
3	Page A7, Item E.7	Is there a way to add a cross-reference to TH-00-06 (Unit 1 SGTR) to show that we are using bounding values? Alternatively this could be stated in the dose consequence calculations.	TH-00-06 has been added to the reference list and the Item E.7 comment was revised to state that the Unit 2 flashed flow exceeds Unit 1 value, and is therefore applied to produce bounding flashing fractions.	Response accepted. -JJW (02/12/16)