Progress Energy

Serial: NPD-NRC-2009-179
August 6, 2009

10CFR52.79

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555-0001

LEVY NUCLEAR POWER PLANT, UNITS 1 AND 2
DOCKET NOS. 52-029 AND 52-030
SUPPLEMENT 1 TO RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 001 RELATED TO DESIGN BASIS ACCIDENTS RADIOLOGICAL CONSEQUENCE ANALYSES

References:
1. Letter from Ravindra G. Joshi (NRC) to Garry Miller (PEF), dated November 25, 2008, "Request for Additional Information Letter No. 001 Related to SRP Section 15.00.03 for the Levy County Nuclear Plant, Units 1 and 2 Combined License Application"

2. Letter from Garry D. Miller (PEF) to U. S. Nuclear Regulatory Commission, dated December 19, 2008, "Response to Request for Additional Information Letter No. 001 Related to Design Basis Accidents Radiological Consequence Analyses", Serial: NPD-NRC-2008-092

Ladies and Gentlemen:

Progress Energy Florida, Inc. (PEF) hereby submits a revised response to the Nuclear Regulatory Commission's (NRC) request for additional information provided in the referenced letter.

A revised response to the NRC request is addressed in the enclosure. The enclosure also identifies changes that will be made in a future revision of the Levy Nuclear Power Plant Units 1 and 2 application.

If you have any further questions, or need additional information, please contact Bob Kitchen at (919) 546-6992, or me at (919) 546-6107.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on August 6, 2009.

Sincerely,

Garry D. Miller
General Manager
Nuclear Plant Development

Progress Energy Florida, Inc.
P.O. Box 14042
St. Petersburg, FL 33733

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NRO

Enclosure

cc : U.S. NRC Region II, Regional Administrator
Mr. Brian C. Anderson, U.S. NRC Project Manager
Mr. Doug Bruner, U.S. NRC Environmental Project Manager

Levy Nuclear Power Plant Units 1 and 2
Supplement 1 to Response to NRC Request for Additional Information Letter No. 001
Related to SRP Section 15.00.03 for the Combined License Application,
Dated November 25, 2008

NRC RAI #	Progress Energy RAI #	Progress Energy Response
15.00.03-1	L-0517	Revised response enclosed – see following pages

NRC Letter No.: LEVY-RAI-LTR-001

NRC Letter Date: November 25, 2008

NRC Review of Final Safety Analysis Report

NRC RAI #: 15.00.03-1

Text of NRC RAI:

By letter dated August 14, 2008, NRC informed the AP1000 vendor that an unacceptable assumption was made in evaluating the LOCA DBA for Revision 16 of the AP1000 DCD. Both FSAR Chapter 15 and Section 6.4 of the subject COL application incorporate by reference the design basis accident analyses in Revision 16 of the AP1000 DCD. Provide an evaluation of the LOCA that does not make use of the unacceptable assumption. Describe any design or siting changes that are intended to compensate for the unacceptable assumption.

PGN RAI ID #: L-0517

PGN Response to NRC RAI:

Westinghouse has issued Revision 17 of the AP1000 DCD, which contained a reevaluation of the LOCA. This reevaluation does not make use of the rejected assumption, but does include design changes. DCD Revision 17 will be incorporated by reference into the next revision of the COLA. Although no siting changes for LNP are necessary, LNP COLA FSAR Tables 2.0-201, 2.0-202, 2.3.4-201 and 2.3.4-206 and LNP COLA ER Section 7.1.3 and Tables 7.1-2 through 7.1-12 will be updated as a result of this change to include the DCD Revision 17 values. The change involves incorporation of the short-term (accident) and Control Room X/Q values used in the DCD accident evaluation to which the LNP site-specific values are compared and revision to the LNP ER site specific accident doses.

Associated LNP COL Application Revisions:

The following changes will be made in a future revision to the LNP application:

1. Revise LNP COLA FSAR Table 2.0-201 (Sheet 7 of 8) as shown on page 4.
2. Revise LNP COLA FSAR Table 2.0-202 (Sheet 1 of 2) as shown on page 5.
3. Revise LNP COLA FSAR Table 2.3.4-201 as shown on page 6.
4. Revise LNP COLA FSAR Table 2.3.4-206 (Sheet 1 of 2) as shown on page 7.
5. Revise the third sentence of the second paragraph of ER Section 7.1.3 from:

   The X/Q value for 1.2 to 3.2 hours at the LNP site was not calculated.

   To read:

   The X/Q value for 1.4 to 3.4 hours at the LNP site was not calculated.

6. Replace existing ER Tables 7.1-2 through 7.1-12 with the tables shown on pages 8 through 17.

Attachments/Enclosures:

None.

LNP SUP 2.0-1

Table 2.0-201 (Sheet 7 of 8)
Comparison of AP1000 DCD Site Parameters and LNP Site Characteristics

	AP 1000 DCD Site Parameters	LNP Site Characteristics	LNP Site Characteristic Reference	Bounding Yes/No
Plant Grade Elevation	Less than plant elevation 100 ft., except for portion at a higher elevation adjacent to the annex building	The nominal plant grade floor elevation is 51 ft. NAVD88 or 52 ft. NGVD29, which corresponds to AP1000 elevation of 100 ft. The actual plant grade will be lower and will vary to accommodate site grading, drainage, and local site flooding. Therefore, DCD plant elevation of 100 ft. = 51 ft. NAVD88 or 52 ft. NGVD29.	FSAR Subsection 2.4.1.1	Yes
Precipitation				
Rain	20.7 in./hr [1-hr 1-mi^2 PMP]	19.6 in./hr	FSAR Subsection 2.4.2.3	Yes
Snow / Ice	75 lb/ft^2 on ground with exposure factor of 1.0 and important factor of 1.2 (safety) and 1.0 (non-safety)	The 50-year recurrent Ground Snow Load for all monitoring stations is zero; therefore, estimations of the weight of snowpack are not necessary for the LNP site.	FSAR Subsection 2.3.1.2.3	Yes
Atmospheric Dispersion Values X/Q (f)				
Site Boundary (0-2 hours)	≤ ~~1.0 x 10^{-3}~~ 5.1 x 10^{-4} sec/m^3	~~3.16~~ 2.56 x 10^{-4} sec/m^3	Table 2.3.4-201	Yes
Site Boundary (annual average)	≤ 2.0 x 10^{-5} sec/m^3	1.52 x 10^{-6} sec/m^3	Table 2.3.4-205	Yes
Low population zone boundary				Yes
0-8 hours	≤ ~~5.0~~ 2.2 x 10^{-4} sec/m^3	~~4.65~~ 4.44 x 10^{-5} sec/m^3	Table 2.3.4-201	Yes
8-24 hours	≤ ~~3.0~~ 1.6 x 10^{-4} sec/m^3	~~2.97~~ 3.18 x 10^{-5} sec/m^3	Table 2.3.4-201	Yes
24-96 hours	≤ ~~1.5~~ 1.0 x 10^{-4} sec/m^3	~~1.12~~ 1.54 x 10^{-5} sec/m^3	Table 2.3.4-201	Yes
96-720 hours	≤ 8.0 x 10^{-5} sec/m^3	~~2.75~~ 5.44 x 10^{-6} sec/m^3	Table 2.3.4-201	Yes
Population Distribution				
Exclusion area (site)(g)	0.5 miles	The minimum distance from the effluent release boundary to the exclusion area boundary is 1340 m (4396 ft. or 0.83 mi.).	FSAR Subsection 2.1.1.2	Yes

LNP SUP 2.0-1

Table 2.0-202 (Sheet 1 of 2)
Comparison of Predicted LNP Control Room Chi/Q Values with AP1000 DCD Acceptance Criteria

Chi/Q (sec/m^3) at HVAC Intake for the Identified Release Points[a]

	Plant Vent or PCS Air Diffuser[b]	Plant Vent	PCS Air Diffuser	**Ground Level Containment Release Points[c,h]**	Ground Level Containment Release Points	**PORV and Safety Valve Releases[d]**	PORV and Safety Valve Releases	**Condenser Air Removal Stack[g]**	Condenser Air Removal Stack	**Steam Line Break Releases**	Steam Vent	**Fuel Handling Area[e]**	Fuel Handling Area Blowout Panel	Radwaste Building Truck Staging Area Door
Release Time	**DCD**	LNP	LNP	**DCD**	LNP	**DCD**	LNP	**DCD**	LNP	**DCD**	LNP	**DCD**	LNP	LNP
0 - 2 hours	**3.0E-03**	1.7E-03	1.5E-03	**6.0E-03**	4.3E-03	**2.0E-02**	1.0E-02	**6.0E-03**	1.7E-03	**2.4E-02**	1.1E-02	**6.0E-03**	1.3E-03	1.0E-03
2 - 8 hours	**2.5E-03**	1.0E-03	8.4E-04	**3.6E-03**	3.5E-03	**1.8E-02**	5.7E-03	**4.0E-03**	1.4E-03	**2.0E-02**	6.1E-03	**4.0E-03**	8.3E-04	6.4E-04
8 - 24 hours	**1.0E-03**	4.5E-04	3.7E-04	**1.4E-03**	1.2E-03	**7.0E-03**	2.7E-03	**2.0E-03**	6.4E-04	**7.5E-03**	3.0E-03	**2.0E-03**	3.7E-04	3.0E-04
1 - 4 days	**8.0E-04**	4.5E-04	3.8E-04	**1.8E-03**	1.2E-03	**5.0E-03**	2.1E-03	**1.5E-03**	5.9E-04	**5.5E-03**	2.3E-03	**1.5E-03**	3.4E-04	2.6E-04
4 - 30 days	**6.0E-04**	3.6E-04	3.0E-04	**1.5E-03**	9.9E-04	**4.5E-03**	1.3E-03	**1.0E-03**	4.7E-04	**5.0E-03**	1.5E-03	**1.0E-03**	2.7E-04	2.0E-04

Chi/Q (sec/m^3) at Annex Building Door for the Identified Release Points[f]

	Plant Vent or PCS Air Diffuser[b]	Plant Vent	PCS Air Diffuser	**Ground Level Containment Release Points[c]**	Ground Level Containment Release Points	**PORV and Safety Valve Releases[d]**	PORV and Safety Valve Releases	**Condenser Air Removal Stack[g]**	Condenser Air Removal Stack	**Steam Line Break Releases**	Steam Vent	**Fuel Handling Area[e]**	Fuel Handling Area Blowout Panel	Radwaste Building Truck Staging Area Door
Release Time	**DCD**	LNP	LNP	**DCD**	LNP	**DCD**	LNP	**DCD**	LNP	**DCD**	LNP	**DCD**	LNP	LNP
0 - 2 hours	**1.0E-03**	3.7E-04	3.8E-04	**1.0E-03**	3.4E-04	**4.0E-03**	8.3E-04	**2.0E-02**	3.2E-03	**4.0E-03**	8.0E-04	**6.0E-03**	3.3E-04	3.2E-04
2 - 8 hours	**7.5E-04**	2.4E-04	2.5E-04	**7.5E-04**	2.8E-04	**3.2E-03**	4.8E-04	**1.8E-02**	1.8E-03	**3.2E-03**	4.7E-04	**4.0E-03**	2.2E-04	2.1E-04
8 - 24 hours	**3.5E-04**	1.1E-04	1.1E-04	**3.5E-04**	1.3E-04	**1.2E-03**	2.3E-04	**7.0E-03**	7.8E-04	**1.2E-03**	2.2E-04	**2.0E-03**	1.0E-04	1.0E-04
1 - 4 days	**2.8E-04**	1.1E-04	1.1E-04	**2.8E-04**	1.2E-04	**1.0E-03**	2.2E-04	**5.0E-03**	6.9E-04	**1.0E-03**	2.1E-04	**1.5E-03**	9.8E-05	9.4E-05
4 - 30 days	**2.5E-04**	8.9E-05	9.1E-05	**2.5E-04**	1.0E-04	**8.0E-04**	1.8E-04	**4.5E-03**	5.3E-04	**8.0E-04**	1.8E-04	**1.0E-03**	7.8E-05	7.5E-05

LNP COL 2.3-4

Table 2.3.4-201
Predicted LNP 1 and LNP 2 Chi/Q Values

Location and Averaging Period	AP1000 DCD Acceptance Criteria Chi/Q	LNP 1 and LNP 2 Maximum Predicted Chi/Q[(a)]
Exclusion Area Boundary		
0 – 2 hr.	≤ ~~1.0 x 10^{-3}~~ 5.1 x 10^{-4} sec/m^3	~~3.16~~2.56 x 10^{-4} sec/m^3
Low Population Zone		
0 – 8 hr.	≤ ~~5.0~~ 2.2 x 10^{-4} sec/m^3	~~4.65~~ 4.44 x 10^{-5} sec/m^3
8 – 24 hr.	≤ ~~3.0~~ 1.6x 10^{-4} sec/m^3	~~2.97~~ 3.18 x 10^{-5} sec/m^3
24 – 96 hr.	≤ ~~1.5~~ 1.0x 10^{-4} sec/m^3	~~1.12~~ 1.54 x 10^{-5} sec/m^3
96 – 720 hr.	≤ 8.0 x 10^{-5} sec/m^3	~~2.75~~ 5.44 x 10^{-6} sec/m^3

Notes:

a) Maximum predicted Chi/Q values occurred in the SW sector for EAB and W sector for LPZ.

Chi/Q = atmospheric dilution factor
sec/m^3 = second per cubic meter
hr. = hour

LNP COL 2.3-4

Table 2.3.4-206 (Sheet 1 of 2)
Comparison of Control Room Atmospheric Dispersion Factors for Accident Analysis for AP1000 DCD and LNP Units 1 and 2

Chi/Q (sec/m^3) at HVAC Intake for the Identified Release Points[a]

	Plant Vent or PCS Air Diffuser[b]	Plant Vent	PCS Air Diffuser	**Ground Level Containment Release Points[c,h]**	Ground Level Containment Release Points	**PORV and Safety Valve Releases[d]**	PORV and Safety Valve Releases	**Condenser Air Removal Stack[g]**	Condenser Air Removal Stack	**Steam Line Break Releases**	Steam Vent	**Fuel Handling Area[e]**	Fuel Handling Area Blowout Panel	Radwaste Building Truck Staging Area Door
Release Time	**DCD**	LNP	LNP	**DCD**	LNP	**DCD**	LNP	**DCD**	LNP	**DCD**	LNP	**DCD**	LNP	LNP
0 - 2 hours	**3.0E-03**	1.7E-03	1.5E-03	**6.0E-03**	4.3E-03	**2.0E-02**	1.0E-02	**6.0E-03**	1.7E-03	**2.4E-02**	1.1E-02	**6.0E-03**	1.3E-03	1.0E-03
2 - 8 hours	**2.5E-03**	1.0E-03	8.4E-04	**3.6E-03**	3.5E-03	**1.8E-02**	5.7E-03	**4.0E-03**	1.4E-03	**2.0E-02**	6.1E-03	**4.0E-03**	8.3E-04	6.4E-04
8 - 24 hours	**1.0E-03**	4.5E-04	3.7E-04	**1.4E-03**	1.2E-03	**7.0E-03**	2.7E-03	**2.0E-03**	6.4E-04	**7.5E-03**	3.0E-03	**2.0E-03**	3.7E-04	3.0E-04
1 - 4 days	**8.0E-04**	4.5E-04	3.8E-04	**1.8E-03**	1.2E-03	**5.0E-03**	2.1E-03	**1.5E-03**	5.9E-04	**5.5E-03**	2.3E-03	**1.5E-03**	3.4E-04	2.6E-04
4 - 30 days	**6.0E-04**	3.6E-04	3.0E-04	**1.5E-03**	9.9E-04	**4.5E-03**	1.3E-03	**1.0E-03**	4.7E-04	**5.0E-03**	1.5E-03	**1.0E-03**	2.7E-04	2.0E-04

Chi/Q (sec/m^3) at Annex Building Door for the Identified Release Points[f]

	Plant Vent or PCS Air Diffuser[b]	Plant Vent	PCS Air Diffuser	**Ground Level Containment Release Points[c]**	Ground Level Containment Release Points	**PORV and Safety Valve Releases[d]**	PORV and Safety Valve Releases	**Condenser Air Removal Stack[g]**	Condenser Air Removal Stack	**Steam Line Break Releases**	Steam Vent	**Fuel Handling Area[e]**	Fuel Handling Area Blowout Panel	Radwaste Building Truck Staging Area Door
Release Time	**DCD**	LNP	LNP	**DCD**	LNP	**DCD**	LNP	**DCD**	LNP	**DCD**	LNP	**DCD**	LNP	LNP
0 - 2 hours	**1.0E-03**	3.7E-04	3.8E-04	**1.0E-03**	3.4E-04	**4.0E-03**	8.3E-04	**2.0E-02**	3.2E-03	**4.0E-03**	8.0E-04	**6.0E-03**	3.3E-04	3.2E-04
2 - 8 hours	**7.5E-04**	2.4E-04	2.5E-04	**7.5E-04**	2.8E-04	**3.2E-03**	4.8E-04	**1.8E-02**	1.8E-03	**3.2E-03**	4.7E-04	**4.0E-03**	2.2E-04	2.1E-04
8 - 24 hours	**3.5E-04**	1.1E-04	1.1E-04	**3.5E-04**	1.3E-04	**1.2E-03**	2.3E-04	**7.0E-03**	7.8E-04	**1.2E-03**	2.2E-04	**2.0E-03**	1.0E-04	1.0E-04
1 - 4 days	**2.8E-04**	1.1E-04	1.1E-04	**2.8E-04**	1.2E-04	**1.0E-03**	2.2E-04	**5.0E-03**	6.9E-04	**1.0E-03**	2.1E-04	**1.5E-03**	9.8E-05	9.4E-05
4 - 30 days	**2.5E-04**	8.9E-05	9.1E-05	**2.5E-04**	1.0E-04	**8.0E-04**	1.8E-04	**4.5E-03**	5.3E-04	**8.0E-04**	1.8E-04	**1.0E-03**	7.8E-05	7.5E-05

Table 7.1-2
Summary of LNP Site-Specific Off-Site Doses Consequences

Accident	EAB Dose TEDE (Sv [rem])	LPZ Dose TEDE (Sv [rem])	Guideline Limit TEDE (Sv [rem])
Main Steam Line Break			
Preexisting Iodine Spike	7.8E-04 (7.8E-02)	1.7E-04 (1.7E-02)	0.25 (25)
Accident-Initiated Iodine Spike	8.6E-04 (8.6E-02)	4.6E-04 (4.6E-02)	0.025 (2.5)
Reactor Coolant Pump Locked Rotor			
No Feedwater	6.2E-04 (6.2E-02)	8.2E-05 (8.2E-03)	0.025 (2.5)
Feedwater Available	4.7E-04 (4.7E-02)	1.7E-04 (1.7E-02)	0.025 (2.5)
Control Rod Ejection Accident	2.8E-03 (2.8E-01)	1.2E-03 (1.2E-01)	0.063 (6.3)
Steam Generator Tube Rupture			
Preexisting Iodine Spike	1.7E-03 (1.7E-01)	2.6E-04 (2.6E-02)	0.25 (25)
Accident-Initiated Iodine Spike	8.6E-04 (8.6E-02)	1.8E-04 (1.8E-02)	0.025 (2.5)
Small Line Break	1.6E-03 (1.6E-01)	2.2E-04 (2.2E-02)	0.025 (2.5)
Design Basis LOCA	3.7E-02 (3.7E+00)	1.1E-02 (1.1E+00)	0.25 (25)
Fuel Handling Accident	4.1E-03 (4.1E-01)	5.5E-04 (5.5E-02)	0.063 (6.3)

Notes:

Doses are based on Federal Guidance Report 11 and Federal Guidance Report 12 dose conversion.

TEDE guidelines are from Regulatory Guide 1.183. Small line break criteria based on Environmental Standard Review Plan 15.6.2.

EAB = exclusion area boundary
LOCA = loss of coolant accident
LPZ = low population zone
rem = roentgen equivalent man
Sv = Sievert
TEDE = total effective dose equivalent

Table 7.1-3
Ratio of LNP 50 Percent Accident Site X/Q Values to AP1000 DCD X/Q Values

			X/Q Ratio
Post Accident Time Period (Hours)	**LNP Site X/Q Values (sec/m^3)**	**AP1000 DCD X/Q Values (sec/m^3)**	**LNP Site / AP1000 DCD**
LOCA			
EAB			
1.4--3.4 hr (1)	7.81E-05	5.1E-04	1.53E-01
LPZ			
0--8 hr	1.06E-05	2.2E-04	4.82E-02
8--24 hr	7.81E-06	1.6E-04	4.88E-02
24--96 hr	4.01E-06	1.0E-04	4.01E-02
96--720 hr	1.54E-06	8.0E-05	1.93E-02
All Other Accidents			
EAB			
0--2 hr	7.81E-05	1.0E-03	7.81E-02
LPZ			
0--8 hr	1.06E-05	5.00E-04	2.12E-02
8--24 hr	7.81E-06	3.00E-04	2.60E-02
24--96 hr	4.01E-06	1.50E-04	2.67E-02
96--720 hr	1.54E-06	8.00E-05	1.93E-02

Notes:
(1): The EAB X/Q value for the period 0 to 2 hours was used for the 1.4 to 3.4 hour period for the LNP site. The 1.4 to 3.4 hour period represents the worst two hour period for the EAB dose.
Definitions:
EAB = exclusion area boundary
LPZ = low population zone
sec/m^3 = seconds per cubed meter
X/Q = atmospheric dispersion coefficient

Table 7.1-4
Main Steam Line Break, 0 to 72 Hours, Preexisting Iodine Spike

Time (Hours)	EAB Dose TEDE (Sv [rem])	LPZ Dose TEDE (Sv [rem])
AP1000 Tier 2		
0 to 2	1.00E-02 (1.00E+00)	
0 to 8	--	5.81E-03 (5.81E-01)
8 to 24	--	7.18E-04 (7.18E-02)
24 to 96	--	1.08E-03 (1.08E-01)
Total	**1.00E-02 (1.00E+00)**	**7.61E-03 (7.61E-01)**
LNP Site		
0 to 2	7.81E-04 (7.81E-02)	
0 to 8	--	1.23E-04 (1.23E-02)
8 to 24	--	1.87E-05 (1.87E-03)
24 to 96	--	2.89E-05 (2.89E-03)
Total	**7.81E-04 (7.81E-02)**	**1.71E-04 (1.71E-02)**
Limit	0.25 (25)	0.25 (25)

Notes:

EAB = exclusion area boundary
LPZ = low population zone
rem = roentgen equivalent man
Sv = Sievert
TEDE = total effective dose equivalent

Table 7.1-5
Main Steam Line Break, 0 to 72 Hours, Accident-Initiated Iodine Spike

Time (Hours)	EAB Dose TEDE (Sv [rem])	LPZ Dose TEDE (Sv [rem])
AP1000 Tier 2		
0 to 2	1.10E-02 (1.10E+00)	
0 to 8	--	1.02E-02 (1.02E+00)
8 to 24	--	3.77 E-03 (3.77E-01)
24 to 96	--	5.36E-03 (5.36E-01)
Total	**1.10E-02 (1.10E+00)**	**1.93E-02 (1.93E+00)**
LNP Site		
0 to 2	8.59E-04 (8.59E-02)	
0 to 8	--	2.16E-04 (2.16E-02)
8 to 24	--	9.81E-05 (9.81E-03)
24 to 72	--	1.43E-04 (1.47E-02)
Total	**8.59E-04 (8.59E-02)**	**4.58E-04 (4.58E-02)**
Limit	0.025 (2.5)	0.025 (2.5)

Notes:

EAB = exclusion area boundary
LPZ = low population zone
rem = roentgen equivalent man
Sv = Sievert
TEDE = total effective dose equivalent

Table 7.1-6
Locked Rotor Accident, 0 to 1.5 Hours, Preexisting Iodine Spike

Time (Hours)	EAB Dose TEDE (Sv [rem])	LPZ Dose TEDE (Sv [rem])
No Feedwater		
AP1000 Tier 2		
0 to 1.5	8.00E-03 (8.00E-01)	3.89E-03 (3.89E-01)
LNP Site		
0 to 1.5	6.25E-04 (6.25E-02)	8.25E-05 (8.25E-03)
Locked Rotor Accident, 0 to 8 Hours, Preexisting Iodine Spike		
Feedwater Available		
AP1000 Tier 2		
0 to 2	6.00E-03 (6.00E-01)	
0 to 8	--	7.94 E-03 (7.94E-01)
Total	**6.00E-03 (6.00E-01)**	**7.94E-03 (7.94E-01)**
LNP Site		
0 to 2	4.69E-04 (4.69E-02)	
0 to 8	--	1.68E-04 (1.68E-02)
Total	**4.69E-04 (4.69E-02)**	**1.68E-04 (1.68E-02)**
Limit	0.025 (2.5)	0.025 (2.5)

Notes:

EAB = exclusion area boundary
LPZ = low population zone
rem = roentgen equivalent man
Sv = Sievert
TEDE = total effective dose equivalent

Table 7.1-7
Control Rod Ejection Accident, 0 to 720 Hours, Preexisting Iodine Spike

Time (Hours)	EAB Dose TEDE (Sv [rem])	LPZ Dose TEDE (Sv [rem])
AP1000 Tier 2		
0 to 2	3.60E-02 (3.60E+00)	
0 to 8	--	4.58E-02 (4.58E+00)
8 to 24	--	7.84E-03 (7.84E-01)
24 to 96	--	6.82E-04 (6.32E-02)
96 to 720	--	2.06E-04 (2.06E-02)
Total	**3.60E-02 (3.60E+00)**	**5.45E-02 (5.45E+00)**
LNP Site		
0 to 2	2.81E-03 (2.8E-01)	
0 to 8	--	9.71E-04 (9.71E-02)
8 to 24	--	2.04E-04 (2.04E-02)
24 to 96	--	1.69E-05 (1.69E-03)
96 to 720	--	3.97E-06 (3.97E-04)
Total	**2.81E-03 (2.81E-01)**	**1.20E-03 (1.20E-01)**
Limit	0.063 (6.3)	0.063 (6.3)

Notes:

EAB = exclusion area boundary
LPZ = low population zone
rem = roentgen equivalent man
Sv = Sievert
TEDE = total effective dose equivalent

Table 7.1-8
Steam Generator Tube Rupture, 0 to 24 Hours, Accident-Initiated Iodine Spike

Time (Hours)	EAB Dose TEDE (Sv [rem])	LPZ Dose TEDE (Sv [rem])
AP1000 Tier 2		
0 to 2	1.10E-02 (1.10E+00)	
0 to 8	--	6.27E-03 (6.27E-01)
8 to 24	--	1.69E-03 (1.69E-01)
Total	**1.10E-02 (1.10E+00)**	**7.96E-03 (7.96E-01)**
LNP Site		
0 to 2	8.59E-04 (8.59E-02)	
0 to 8	--	1.33E-04 (1.33E-02)
8 to 24	--	4.40E-05 (4.40E-03)
Total	**8.59E-04 (8.59E-02)**	**1.77E-04 (1.77E-02)**
Limit	0.025 (2.5)	0.025 (2.5)

Notes:

EAB = exclusion area boundary
LPZ = low population zone
rem = roentgen equivalent man
Sv = Sievert
TEDE = total effective dose equivalent

Table 7.1-9
Steam Generator Tube Rupture, 0 to 24 Hours, Preexisting Iodine Spike

Time (Hours)	EAB Dose TEDE (Sv [rem])	LPZ Dose TEDE (Sv [rem])
AP1000 Tier 2		
0 to 2	2.20E-02 (2.20E+00)	
0 to 8	--	1.16E-02 (1.16E+00)
8 to 24	--	7.24E-04 (7.24E-02)
Total	**2.20E-02 (2.20E+00)**	**1.23E-02 (1.23E+00)**
LNP Site		
0 to 2	1.72E-03 (1.72E-01)	
0 to 8	--	2.46E-04 (2.46E-02)
8 to 24	--	1.88E-05 (1.88E-03)
Total	**1.72E-03 (1.72E-01)**	**2.65E-04 (2.65E-02)**
Limit	0.25 (2.5)	0.25 (2.5)

Notes:

EAB = exclusion area boundary
LPZ = low population zone
rem = roentgen equivalent man
Sv = Sievert
TEDE = total effective dose equivalent

Table 7.1-10
Small Line Break Accident, 0 to 0.5 Hours, Accident-Initiated Iodine Spike

Time (Hours)	EAB Dose TEDE (Sv [rem])	LPZ Dose TEDE (Sv [rem])
AP1000 Tier 2		
0 to 0.5	2.10E-02 (2.10E+00)	1.02E-02 (1.02E+00)
LNP Site		
0 to 0.5	1.64E-03 (1.64E-01)	2.16E-04 (2.16E-02)
Limit	0.025 (2.5)	0.025 (2.5)

Notes:

EAB = exclusion area boundary
LPZ = low population zone
rem = roentgen equivalent man
Sv = Sievert
TEDE = total effective dose equivalent

Table 7.1-11
AP1000 Design Basis LOCA

Time (Hours)	EAB Dose TEDE (Sv [rem]) [(a)]	LPZ Dose TEDE (Sv [rem])
AP1000 Tier 2		
1.4 to 3.4	2.46E-01 (2.46E+01)	-
0 to 8	--	2.17E-01 (2.17E+01)
8 to 24	--	7.50E-03 (7.50E-01)
24 to 96	--	2.93E-03 (2.93E-01)
96 to 720	--	5.49E-03 (5.49E-01)
Total	**2.46E-01 (2.46E+01)**	**2.33E-01 (2.33E+01)**
LNP Site		
1.4 to 3.4	3.74E-02 (3.74E+00)	-
0 to 8	--	1.05E-02 (1.05E+00)
8 to 24	--	3.66E-04 (3.66E-02)
24 to 96	--	1.17E-04 (1.17E-02)
96 to 720	--	1.06E-04 (1.06E-02)
Total	**3.74E-02 (3.74E+00)**	**1.10E-02 (1.10E+00)**
Limit	0.25 (25)	0.25 (25)

Notes:

a) The EAB dose is for the worst 2-hour period.

EAB = exclusion area boundary
LOCA = loss of coolant accident
LPZ = low population zone
rem = roentgen equivalent man
Sv = Sievert
TEDE = total effective dose equivalent

Table 7.1-12
Fuel Handling Accidents, 0 to 2 Hours

Time (Hours)	EAB Dose TEDE (Sv [rem])	LPZ Dose TEDE (Sv [rem])
AP1000 Tier 2		
0 to 2	5.20E-02 (5.20E+00)	2.59E-02 (2.59E+00)
LNP Site		
0 to 2	4.06E-03 (4.06E-01)	5.49E-04 (5.49E-02)
Limit	0.063 (6.3)	0.063 (6.3)

Notes:

EAB = exclusion area boundary
LPZ = low population zone
rem = roentgen equivalent man
Sv = Sievert
TEDE = total effective dose equivalent