

APPENDIX D SEISMIC CORE-DAMAGE FREQUENCIES

This appendix provides the seismic core- damage frequency (SCDF) estimates developed in the Safety/Risk Assessment. It is organized into four tables as follows:

- Table D-1: Seismic Core-Damage Frequencies Using 2008 USGS Seismic Hazard Curves
- Table D-2: Seismic Core-Damage Frequencies Using 1989 EPRI Seismic Hazard Curves
- Table D-3: Seismic Core-Damage Frequencies Using 1994 LLNL Seismic Hazard Curves
- Tables D-4: IPEEE SPRA Results and SPAR Model Results

Table D-1. Seismic Core-Damage Frequencies Using 2008 USGS Seismic Hazard Curves.

Plant Name	Docket Number	Updated USGS								
		PGA	10 Hz	5 Hz	1 Hz	max	controlling curve	simple average	IPEEE weighted average	weakest link model
Arkansas Nuclear 1	05000313	3.8E-06	3.9E-06	1.5E-06	1.4E-06	3.9E-06	10 Hz	2.6E-06	2.5E-06	4.1E-06
Arkansas Nuclear 2	05000368	3.8E-06	3.9E-06	1.5E-06	1.4E-06	3.9E-06	10 Hz	2.6E-06	2.5E-06	4.1E-06
Beaver Valley 1	05000334	2.6E-05	3.4E-05	4.8E-05	7.4E-06	4.8E-05	5 HZ	2.9E-05	2.9E-05	4.8E-05
Beaver Valley 2	05000412	1.1E-05	1.6E-05	2.2E-05	3.5E-06	2.2E-05	5 HZ	1.3E-05	1.3E-05	2.2E-05
Braidwood 1	05000456	7.3E-06	5.3E-06	2.2E-06	7.3E-07	7.3E-06	PGA	3.9E-06	3.4E-06	7.3E-06
Braidwood 2	05000457	7.3E-06	5.3E-06	2.2E-06	7.3E-07	7.3E-06	PGA	3.9E-06	3.4E-06	7.3E-06
Browns Ferry 1	05000259	3.5E-06	3.5E-06	1.3E-06	1.2E-06	3.5E-06	PGA	2.4E-06	2.2E-06	3.7E-06
Browns Ferry 2	05000260	5.0E-06	5.2E-06	2.0E-06	2.0E-06	5.2E-06	10 Hz	3.5E-06	3.3E-06	5.4E-06
Browns Ferry 3	05000296	5.0E-06	5.2E-06	2.0E-06	2.0E-06	5.2E-06	10 Hz	3.5E-06	3.3E-06	5.4E-06
Brunswick 1	05000325	9.5E-06	1.5E-05	1.2E-05	1.1E-06	1.5E-05	10 Hz	9.4E-06	9.4E-06	1.5E-05
Brunswick 2	05000324	9.5E-06	1.5E-05	1.2E-05	1.1E-06	1.5E-05	10 Hz	9.4E-06	9.4E-06	1.5E-05
Byron 1	05000454	5.8E-06	4.2E-06	1.8E-06	5.6E-07	5.8E-06	PGA	3.1E-06	2.7E-06	5.8E-06
Byron 2	05000455	5.8E-06	4.2E-06	1.8E-06	5.6E-07	5.8E-06	PGA	3.1E-06	2.7E-06	5.8E-06
Callaway	05000483	1.8E-06	1.9E-06	6.3E-07	1.5E-07	1.9E-06	10 Hz	1.1E-06	1.0E-06	2.0E-06
Calvert Cliffs 1	05000317	2.5E-06	5.0E-06	3.1E-06	9.9E-06	9.9E-06	1 HZ	5.1E-06	5.5E-06	1.0E-05
Calvert Cliffs 2	05000318	2.9E-06	6.0E-06	3.8E-06	1.2E-05	1.2E-05	1 HZ	6.1E-06	6.6E-06	1.2E-05
Catawba 1	05000413	3.6E-05	3.5E-05	2.0E-05	1.7E-05	3.6E-05	PGA	2.7E-05	2.6E-05	3.7E-05
Catawba 2	05000414	3.6E-05	3.5E-05	2.0E-05	1.7E-05	3.6E-05	PGA	2.7E-05	2.6E-05	3.7E-05
Clinton (0098)	05000461	1.6E-06	2.3E-06	1.7E-06	1.1E-06	2.3E-06	10 Hz	1.7E-06	1.7E-06	2.5E-06
Clinton(UHS)	05000461	1.6E-06	3.5E-06	3.1E-06	1.7E-05	1.7E-05	1 HZ	6.3E-06	6.9E-06	1.7E-05
Comanche Peak 1	05000445	4.0E-06	2.5E-06	1.3E-06	5.3E-07	4.0E-06	PGA	2.1E-06	1.8E-06	4.0E-06
Comanche Peak 2	05000446	4.0E-06	2.5E-06	1.3E-06	5.3E-07	4.0E-06	PGA	2.1E-06	1.8E-06	4.0E-06
Cooper	05000298	5.8E-06	7.0E-06	4.7E-06	3.2E-07	7.0E-06	10 Hz	4.4E-06	4.3E-06	7.0E-06

Table D-1. Seismic Core-Damage Frequencies Using 2008 USGS Seismic Hazard Curves.

Plant Name	Docket Number	Updated USGS								
		PGA	10 Hz	5 Hz	1 Hz	max	controlling curve	simple average	IPEEE weighted average	weakest link model
Crystal River 3	05000302	1.2E-05	2.2E-05	1.2E-05	1.3E-06	2.2E-05	10 Hz	1.2E-05	1.2E-05	2.2E-05
D.C. Cook 1	05000315	1.2E-05	9.0E-06	8.5E-06	1.4E-06	1.2E-05	PGA	7.7E-06	7.1E-06	1.2E-05
D.C. Cook 2	05000316	1.2E-05	9.0E-06	8.5E-06	1.4E-06	1.2E-05	PGA	7.7E-06	7.1E-06	1.2E-05
Davis-Besse	05000346	6.7E-06	5.0E-06	2.2E-06	6.7E-07	6.7E-06	PGA	3.6E-06	3.2E-06	6.7E-06
Dresden 2	05000237	1.9E-05	1.5E-05	7.0E-06	2.4E-06	1.9E-05	PGA	1.1E-05	9.7E-06	1.9E-05
Dresden 3	05000249	1.9E-05	1.5E-05	7.0E-06	2.4E-06	1.9E-05	PGA	1.1E-05	9.7E-06	1.9E-05
Duane Arnold	05000331	2.3E-05	3.2E-05	1.1E-05	1.3E-06	3.2E-05	10 Hz	1.7E-05	1.6E-05	3.2E-05
Farley 1 (1st spectral ratios)	05000348	2.8E-05	1.3E-05	7.4E-06	5.3E-06	2.8E-05	PGA	1.3E-05	1.1E-05	2.8E-05
Farley 1 (2nd spectral ratios)	05000348	2.8E-05	1.3E-05	7.4E-06	2.3E-06	2.8E-05	PGA	1.3E-05	1.1E-05	2.8E-05
Farley 2 (1st spectral ratios)	05000364	2.8E-05	1.3E-05	7.4E-06	5.3E-06	2.8E-05	PGA	1.3E-05	1.1E-05	2.8E-05
Farley 2 (2nd spectral ratios)	05000364	2.8E-05	1.3E-05	7.4E-06	2.3E-06	2.8E-05	PGA	1.3E-05	1.1E-05	2.8E-05
Fermi 2	05000341	4.2E-06	3.0E-06	1.3E-06	4.1E-07	4.2E-06	PGA	2.2E-06	2.0E-06	4.2E-06
FitzPatrick	05000333	6.1E-06	5.0E-06	2.5E-06	1.4E-06	6.1E-06	PGA	3.8E-06	3.4E-06	6.1E-06
Fort Calhoun	05000285	1.1E-05	1.3E-05	3.7E-06	2.0E-07	1.3E-05	10 Hz	7.0E-06	6.4E-06	1.3E-05
Ginna	05000244	1.3E-05	8.0E-06	4.0E-06	1.2E-06	1.3E-05	PGA	6.4E-06	5.6E-06	1.3E-05
Grand Gulf 1	05000416	8.4E-06	1.1E-05	4.7E-06	9.4E-06	1.1E-05	10 Hz	8.3E-06	8.3E-06	1.2E-05
Harris 1	05000400	2.3E-06	1.8E-06	8.7E-07	5.9E-07	2.3E-06	PGA	1.4E-06	1.3E-06	2.3E-06
Hatch 1	05000321	2.1E-06	1.7E-06	1.0E-06	1.1E-06	2.1E-06	PGA	1.5E-06	1.4E-06	2.2E-06
Hatch 2	05000366	2.1E-06	1.7E-06	1.0E-06	1.1E-06	2.1E-06	PGA	1.5E-06	1.4E-06	2.2E-06
Hope Creek 1	05000354	2.8E-06	2.0E-06	1.1E-06	2.0E-06	2.8E-06	PGA	1.9E-06	1.8E-06	2.8E-06
Indian Point 2	05000247	3.2E-05	3.1E-05	3.3E-05	2.4E-05	3.3E-05	5 HZ	3.0E-05	3.0E-05	3.3E-05
Indian Point 3	05000286	9.1E-05	1.0E-04	6.6E-05	2.3E-05	1.0E-04	10 Hz	7.0E-05	6.7E-05	1.0E-04
Kewaunee	05000305	7.1E-06	1.2E-05	3.2E-06	2.6E-06	1.2E-05	10 Hz	6.3E-06	6.2E-06	1.2E-05
La Salle 1 (0098)	05000373	2.3E-06	2.5E-06	1.4E-06	1.4E-07	2.5E-06	10 Hz	1.6E-06	1.5E-06	2.8E-06
La Salle 1 (SSE)	05000373	2.3E-06	2.5E-06	5.3E-07	1.5E-07	2.5E-06	10 Hz	1.4E-06	1.2E-06	2.8E-06
La Salle 1 (UHS)	05000373	2.3E-06	3.6E-06	2.5E-06	3.9E-07	3.6E-06	10 Hz	2.2E-06	2.2E-06	3.7E-06

Table D-1. Seismic Core-Damage Frequencies Using 2008 USGS Seismic Hazard Curves.

Plant Name	Docket Number	Updated USGS								
		PGA	10 Hz	5 Hz	1 Hz	max	controlling curve	simple average	IPEEE weighted average	weakest link model
La Salle 2 (0098)	05000374	2.3E-06	2.5E-06	1.4E-06	1.4E-07	2.5E-06	10 Hz	1.6E-06	1.5E-06	2.8E-06
La Salle 2 (SSE)	05000374	2.3E-06	2.5E-06	5.3E-07	1.5E-07	2.5E-06	10 Hz	1.4E-06	1.2E-06	2.8E-06
La Salle 2 (UHS)	05000374	2.3E-06	3.6E-06	2.5E-06	3.9E-07	3.6E-06	10 Hz	2.2E-06	2.2E-06	3.7E-06
Limerick 1	05000352	5.3E-05	2.5E-05	1.8E-05	7.1E-06	5.3E-05	PGA	2.6E-05	2.2E-05	5.3E-05
Limerick 2	05000353	5.3E-05	2.5E-05	1.8E-05	7.1E-06	5.3E-05	PGA	2.6E-05	2.2E-05	5.3E-05
McGuire 1	05000369	3.1E-05	3.0E-05	1.5E-05	1.1E-05	3.1E-05	PGA	2.2E-05	2.0E-05	3.1E-05
McGuire 2	05000370	3.1E-05	3.0E-05	1.5E-05	1.1E-05	3.1E-05	PGA	2.2E-05	2.0E-05	3.1E-05
Millstone 2	05000336	1.1E-05	9.0E-06	4.4E-06	2.0E-06	1.1E-05	PGA	6.7E-06	6.0E-06	1.1E-05
Millstone 3	05000423	1.5E-05	8.4E-06	5.4E-06	1.6E-06	1.5E-05	PGA	7.6E-06	6.5E-06	1.5E-05
Monticello	05000263	1.9E-05	1.5E-05	8.6E-06	7.6E-07	1.9E-05	PGA	1.1E-05	9.8E-06	1.9E-05
Nine Mile Point 1	05000220	4.2E-06	3.3E-06	1.6E-06	8.5E-07	4.2E-06	PGA	2.5E-06	2.2E-06	4.2E-06
Nine Mile Point 2	05000410	5.6E-06	4.5E-06	2.3E-06	1.3E-06	5.6E-06	PGA	3.4E-06	3.1E-06	5.6E-06
North Anna 1 (1st spectral ratios)	05000338	4.4E-05	3.7E-05	2.0E-05	8.8E-06	4.4E-05	PGA	2.7E-05	2.5E-05	4.4E-05
North Anna 1 (2nd spectral ratios)	05000338	4.4E-05	3.7E-05	2.0E-05	4.7E-06	4.4E-05	PGA	2.6E-05	2.4E-05	4.4E-05
North Anna 2 (1st spectral ratios)	05000339	4.4E-05	3.7E-05	2.0E-05	8.8E-06	4.4E-05	PGA	2.7E-05	2.5E-05	4.4E-05
North Anna 2 (2nd spectral ratios)	05000339	4.4E-05	3.7E-05	2.0E-05	4.7E-06	4.4E-05	PGA	2.6E-05	2.4E-05	4.4E-05
Oconee 1	05000269	2.8E-05	2.7E-05	2.7E-05	4.3E-05	4.3E-05	1 HZ	3.1E-05	3.2E-05	4.3E-05
Oconee 2	05000270	2.8E-05	2.7E-05	2.7E-05	4.3E-05	4.3E-05	1 HZ	3.1E-05	3.2E-05	4.3E-05
Oconee 3	05000287	2.8E-05	2.7E-05	2.7E-05	4.3E-05	4.3E-05	1 HZ	3.1E-05	3.2E-05	4.3E-05
Oyster Creek	05000219	1.0E-05	7.5E-06	1.1E-05	1.3E-05	1.3E-05	1 HZ	1.0E-05	1.0E-05	1.4E-05
Palisades	05000255	6.4E-06	5.5E-06	3.9E-06	1.5E-06	6.4E-06	PGA	4.3E-06	4.0E-06	6.4E-06
Peach Bottom 2	05000277	2.5E-05	2.0E-05	1.0E-05	4.6E-06	2.5E-05	PGA	1.5E-05	1.3E-05	2.4E-05
Peach Bottom 3	05000278	2.5E-05	2.0E-05	1.0E-05	4.6E-06	2.5E-05	PGA	1.5E-05	1.3E-05	2.4E-05
Perry 1	05000440	2.1E-05	1.5E-05	6.4E-06	1.8E-06	2.1E-05	PGA	1.1E-05	9.6E-06	2.1E-05
Pilgrim 1	05000293	4.3E-05	6.9E-05	6.2E-05	2.4E-05	6.9E-05	10 Hz	4.9E-05	5.0E-05	6.9E-05
Point Beach 1	05000266	8.3E-06	1.1E-05	8.6E-06	1.0E-06	1.1E-05	10 Hz	7.3E-06	7.2E-06	1.1E-05

Table D-1. Seismic Core-Damage Frequencies Using 2008 USGS Seismic Hazard Curves.

Plant Name	Docket Number	Updated USGS								
		PGA	10 Hz	5 Hz	1 Hz	max	controlling curve	simple average	IPEEE weighted average	weakest link model
Point Beach 2	05000301	8.3E-06	1.1E-05	8.6E-06	1.0E-06	1.1E-05	10 Hz	7.3E-06	7.2E-06	1.1E-05
Prairie Island 1	05000282	2.5E-06	3.0E-06	1.8E-06	4.3E-08	3.0E-06	10 Hz	1.9E-06	1.8E-06	3.0E-06
Prairie Island 2	05000306	2.5E-06	3.0E-06	1.8E-06	4.3E-08	3.0E-06	10 Hz	1.9E-06	1.8E-06	3.0E-06
Quad Cities 1	05000254	2.7E-05	2.6E-05	1.4E-05	8.6E-06	2.7E-05	PGA	1.9E-05	1.7E-05	2.7E-05
Quad Cities 2	05000265	2.7E-05	2.6E-05	1.4E-05	8.6E-06	2.7E-05	PGA	1.9E-05	1.7E-05	2.7E-05
River Bend 1	05000458	1.6E-05	9.8E-06	5.9E-06	1.5E-05	1.6E-05	PGA	1.2E-05	1.1E-05	2.5E-05
Robinson 2	05000261	1.2E-05	1.4E-05	9.2E-06	1.1E-05	1.4E-05	10 Hz	1.2E-05	1.2E-05	1.5E-05
Saint Lucie 1 (s4)	05000335	2.1E-05	4.6E-05	3.3E-05	1.2E-05	4.6E-05	10 Hz	2.8E-05	2.9E-05	4.6E-05
Saint Lucie 1 (s5)	05000335	2.1E-05	4.6E-05	3.3E-05	1.2E-05	4.6E-05	10 Hz	2.8E-05	2.9E-05	4.6E-05
Saint Lucie 2 (s4)	05000389	2.1E-05	4.6E-05	3.3E-05	1.2E-05	4.6E-05	10 Hz	2.8E-05	2.9E-05	4.6E-05
Saint Lucie 2 (s5)	05000389	2.1E-05	4.6E-05	3.3E-05	1.2E-05	4.6E-05	10 Hz	2.8E-05	2.9E-05	4.6E-05
Salem 1	05000272	7.2E-06	6.3E-06	4.5E-06	1.1E-05	1.1E-05	1 HZ	7.3E-06	7.4E-06	1.1E-05
Salem 2	05000311	7.2E-06	6.3E-06	4.5E-06	1.1E-05	1.1E-05	1 HZ	7.3E-06	7.4E-06	1.1E-05
Seabrook 1	05000443	2.2E-05	1.2E-05	5.9E-06	1.6E-06	2.2E-05	PGA	1.0E-05	8.6E-06	2.2E-05
Sequoyah 1	05000327	5.1E-05	3.9E-05	1.9E-05	8.1E-06	5.1E-05	PGA	2.9E-05	2.6E-05	5.1E-05
Sequoyah 2	05000328	5.1E-05	3.9E-05	1.9E-05	8.1E-06	5.1E-05	PGA	2.9E-05	2.6E-05	5.1E-05
South Texas 1	05000498	6.3E-06	3.5E-06	2.0E-06	9.1E-07	6.3E-06	PGA	3.2E-06	2.7E-06	6.3E-06
South Texas 2	05000499	6.3E-06	3.5E-06	2.0E-06	9.1E-07	6.3E-06	PGA	3.2E-06	2.7E-06	6.3E-06
Summer	05000395	3.9E-05	3.2E-05	1.6E-05	8.8E-06	3.9E-05	PGA	2.4E-05	2.2E-05	3.8E-05
Surry 1	05000280	4.4E-06	3.6E-06	4.6E-06	5.1E-06	5.1E-06	1 HZ	4.4E-06	4.4E-06	5.7E-06
Surry 2	05000281	4.4E-06	3.6E-06	4.6E-06	5.1E-06	5.1E-06	1 HZ	4.4E-06	4.4E-06	5.7E-06
Susquehanna 1	05000387	1.3E-05	1.0E-05	5.3E-06	2.6E-06	1.3E-05	PGA	7.7E-06	7.0E-06	1.3E-05
Susquehanna 2	05000388	1.3E-05	1.0E-05	5.3E-06	2.6E-06	1.3E-05	PGA	7.7E-06	7.0E-06	1.3E-05
Three Mile Island 1	05000289	4.0E-05	1.8E-05	1.3E-05	6.3E-06	4.0E-05	PGA	1.9E-05	1.6E-05	4.0E-05
Turkey Point 3	05000250	6.6E-06	1.0E-05	5.0E-06	1.6E-06	1.0E-05	10 Hz	5.9E-06	5.8E-06	1.0E-05
Turkey Point 4	05000251	6.6E-06	1.0E-05	5.0E-06	1.6E-06	1.0E-05	10 Hz	5.9E-06	5.8E-06	1.0E-05

Table D-1. Seismic Core-Damage Frequencies Using 2008 USGS Seismic Hazard Curves.

Plant Name	Docket Number	Updated USGS								
		PGA	10 Hz	5 Hz	1 Hz	max	controlling curve	simple average	IPEEE weighted average	weakest link model
Vermont Yankee	05000271	8.1E-06	6.5E-06	3.2E-06	1.7E-06	8.1E-06	PGA	4.9E-06	4.5E-06	8.1E-06
Vogtle 1	05000424	6.6E-06	5.8E-06	3.6E-06	4.0E-06	6.6E-06	PGA	5.0E-06	4.8E-06	7.1E-06
Vogtle 2	05000425	6.6E-06	5.8E-06	3.6E-06	4.0E-06	6.6E-06	PGA	5.0E-06	4.8E-06	7.1E-06
Waterford 3	05000382	1.8E-05	1.8E-05	7.0E-06	8.1E-06	1.8E-05	10 Hz	1.3E-05	1.2E-05	2.0E-05
Watts Bar 1 (rock)	05000390	3.6E-05	2.7E-05	1.3E-05	5.5E-06	3.6E-05	PGA	2.0E-05	1.8E-05	3.6E-05
Watts Bar 1 (soil)	05000390	3.6E-05	2.8E-05	1.3E-05	2.6E-06	3.6E-05	PGA	2.0E-05	1.8E-05	3.6E-05
Wolf Creek 1	05000482	3.5E-06	3.1E-06	1.2E-06	1.8E-05	1.8E-05	1 HZ	6.5E-06	6.9E-06	1.8E-05

Table D-2. Seismic Core-Damage Frequencies Using 1989 EPRI Seismic Hazard Curves.

Plant Name	Docket Number	EPRI 1989								
		PGA	10 Hz	5 Hz	1 Hz	max	controlling curve	simple average	IPEEE weighted average	weakest link model
Arkansas Nuclear 1	05000313	9.4E-07	6.5E-07	3.5E-07	4.3E-07	9.4E-07	PGA	5.9E-07	5.4E-07	9.4E-07
Arkansas Nuclear 2	05000368	9.4E-07	6.5E-07	3.5E-07	4.3E-07	9.4E-07	PGA	5.9E-07	5.4E-07	9.4E-07
Beaver Valley 1	05000334	1.2E-05	1.3E-05	1.3E-05	6.5E-07	1.3E-05	5 HZ	9.5E-06	9.1E-06	1.3E-05
Beaver Valley 2	05000412	4.5E-06	5.1E-06	5.3E-06	2.9E-07	5.3E-06	5 HZ	3.8E-06	3.7E-06	5.3E-06
Braidwood 1	05000456	5.6E-07	3.5E-07	1.5E-07	5.5E-08	5.6E-07	PGA	2.8E-07	2.4E-07	5.6E-07
Braidwood 2	05000457	5.6E-07	3.5E-07	1.5E-07	5.5E-08	5.6E-07	PGA	2.8E-07	2.4E-07	5.6E-07
Browns Ferry 1	05000259	1.0E-06	6.5E-07	2.8E-07	3.4E-07	1.0E-06	PGA	5.7E-07	5.1E-07	1.0E-06
Browns Ferry 2	05000260	1.6E-06	1.1E-06	4.5E-07	5.9E-07	1.6E-06	PGA	9.2E-07	8.2E-07	1.6E-06
Browns Ferry 3	05000296	1.6E-06	1.1E-06	4.5E-07	5.9E-07	1.6E-06	PGA	9.2E-07	8.2E-07	1.6E-06
Brunswick 1	05000325	3.3E-06	3.6E-06	2.6E-06	2.7E-07	3.6E-06	10 Hz	2.5E-06	2.3E-06	3.8E-06
Brunswick 2	05000324	3.3E-06	3.6E-06	2.6E-06	2.7E-07	3.6E-06	10 Hz	2.5E-06	2.3E-06	3.8E-06
Byron 1	05000454	6.8E-07	4.4E-07	1.9E-07	5.5E-08	6.8E-07	PGA	3.4E-07	2.9E-07	6.8E-07
Byron 2	05000455	6.8E-07	4.4E-07	1.9E-07	5.5E-08	6.8E-07	PGA	3.4E-07	2.9E-07	6.8E-07
Callaway	05000483									
Calvert Cliffs 1	05000317	1.6E-06	5.8E-06	3.8E-06	5.7E-06	5.8E-06	10 Hz	4.2E-06	4.6E-06	7.0E-06
Calvert Cliffs 2	05000318	2.0E-06	7.4E-06	4.8E-06	6.7E-06	7.4E-06	10 Hz	5.2E-06	5.7E-06	8.6E-06
Catawba 1	05000413	3.1E-05	2.2E-05	1.0E-05	3.8E-06	3.1E-05	PGA	1.7E-05	1.5E-05	3.0E-05
Catawba 2	05000414	3.1E-05	2.2E-05	1.0E-05	3.8E-06	3.1E-05	PGA	1.7E-05	1.5E-05	3.0E-05
Clinton (0098)	05000461	1.9E-06	2.6E-06	1.5E-06	7.3E-07	2.6E-06	10 Hz	1.7E-06	1.7E-06	2.7E-06
Clinton(UHS)	05000461	1.9E-06	3.8E-06	2.8E-06	7.2E-06	7.2E-06	1 HZ	3.9E-06	4.2E-06	7.2E-06
Comanche Peak 1	05000445	1.2E-06	4.9E-07	1.8E-07	5.2E-08	1.2E-06	PGA	4.8E-07	3.7E-07	1.2E-06
Comanche Peak 2	05000446	1.2E-06	4.9E-07	1.8E-07	5.2E-08	1.2E-06	PGA	4.8E-07	3.7E-07	1.2E-06
Cooper	05000298									
Crystal River 3	05000302	2.9E-06	5.2E-06	1.3E-06	5.8E-08	5.2E-06	10 Hz	2.4E-06	2.3E-06	5.2E-06
D.C. Cook 1	05000315									

Table D-2. Seismic Core-Damage Frequencies Using 1989 EPRI Seismic Hazard Curves.

Plant Name	Docket Number	EPRI 1989								
		PGA	10 Hz	5 Hz	1 Hz	max	controlling curve	simple average	IPEEE weighted average	weakest link model
D.C. Cook 2	05000316									
Davis-Besse	05000346	1.6E-06	1.0E-06	4.6E-07	3.0E-07	1.6E-06	PGA	8.3E-07	7.3E-07	1.6E-06
Dresden 2	05000237	2.3E-06	1.5E-06	5.5E-07	1.7E-07	2.3E-06	PGA	1.1E-06	9.5E-07	2.3E-06
Dresden 3	05000249	2.3E-06	1.5E-06	5.5E-07	1.7E-07	2.3E-06	PGA	1.1E-06	9.5E-07	2.3E-06
Duane Arnold	05000331									
Farley 1 (1st spectral ratios)	05000348	3.8E-06	2.7E-06	1.2E-06	5.1E-07	3.8E-06	PGA	2.0E-06	1.8E-06	3.8E-06
Farley 1 (2nd spectral ratios)	05000348	3.8E-06	2.8E-06	1.2E-06	2.3E-07	3.8E-06	PGA	2.0E-06	1.7E-06	3.8E-06
Farley 2 (1st spectral ratios)	05000364	3.8E-06	2.7E-06	1.2E-06	5.1E-07	3.8E-06	PGA	2.0E-06	1.8E-06	3.8E-06
Farley 2 (2nd spectral ratios)	05000364	3.8E-06	2.8E-06	1.2E-06	2.3E-07	3.8E-06	PGA	2.0E-06	1.7E-06	3.8E-06
Fermi 2	05000341	1.6E-06	1.1E-06	5.5E-07	2.3E-07	1.6E-06	PGA	8.8E-07	7.7E-07	1.6E-06
FitzPatrick	05000333	1.2E-06	7.5E-07	2.8E-07	2.1E-07	1.2E-06	PGA	6.0E-07	5.2E-07	1.2E-06
Fort Calhoun	05000285									
Ginna	05000244	4.2E-06	1.9E-06	8.9E-07	3.3E-07	4.2E-06	PGA	1.8E-06	1.5E-06	4.2E-06
Grand Gulf 1	05000416	9.3E-07	5.1E-07	1.4E-07	8.5E-06	8.5E-06	1 HZ	2.5E-06	2.8E-06	9.4E-06
Harris 1	05000400	3.6E-06	2.5E-06	1.4E-06	4.8E-07	3.6E-06	PGA	2.0E-06	1.8E-06	3.6E-06
Hatch 1	05000321	6.1E-07	6.3E-07	5.0E-07	5.8E-07	6.3E-07	10 Hz	5.8E-07	5.8E-07	7.4E-07
Hatch 2	05000366	6.1E-07	6.3E-07	5.0E-07	5.8E-07	6.3E-07	10 Hz	5.8E-07	5.8E-07	7.4E-07
Hope Creek 1	05000354	1.0E-06	8.8E-07	6.1E-07	6.3E-07	1.0E-06	PGA	7.8E-07	7.5E-07	1.1E-06
Indian Point 2	05000247	1.1E-05	1.1E-05	1.4E-05	8.3E-06	1.4E-05	5 HZ	1.1E-05	1.1E-05	1.4E-05
Indian Point 3	05000286	5.3E-05	5.8E-05	3.2E-05	7.8E-06	5.8E-05	10 Hz	3.8E-05	3.6E-05	5.8E-05
Kewaunee	05000305	1.0E-05	1.4E-05	1.9E-06	7.7E-07	1.4E-05	10 Hz	6.7E-06	6.2E-06	1.4E-05
La Salle 1 (0098)	05000373	4.1E-07	5.1E-07	3.3E-07	1.5E-08	5.1E-07	10 Hz	3.1E-07	3.0E-07	5.4E-07
La Salle 1 (SSE)	05000373	4.1E-07	5.1E-07	1.5E-07	1.5E-08	5.1E-07	10 Hz	2.7E-07	2.5E-07	5.2E-07
La Salle 1 (UHS)	05000373	4.1E-07	7.8E-07	5.4E-07	3.9E-08	7.8E-07	10 Hz	4.4E-07	4.5E-07	8.0E-07
La Salle 2 (0098)	05000374	4.1E-07	5.1E-07	3.3E-07	1.5E-08	5.1E-07	10 Hz	3.1E-07	3.0E-07	5.4E-07
La Salle 2 (SSE)	05000374	4.1E-07	5.1E-07	1.5E-07	1.5E-08	5.1E-07	10 Hz	2.7E-07	2.5E-07	5.2E-07

Table D-2. Seismic Core-Damage Frequencies Using 1989 EPRI Seismic Hazard Curves.

Plant Name	Docket Number	EPRI 1989								
		PGA	10 Hz	5 Hz	1 Hz	max	controlling curve	simple average	IPEEE weighted average	weakest link model
La Salle 2 (UHS)	05000374	4.1E-07	7.8E-07	5.4E-07	3.9E-08	7.8E-07	10 Hz	4.4E-07	4.5E-07	8.0E-07
Limerick 1	05000352	2.2E-05	6.6E-06	5.2E-06	1.4E-06	2.2E-05	PGA	8.8E-06	6.9E-06	2.2E-05
Limerick 2	05000353	2.2E-05	6.6E-06	5.2E-06	1.4E-06	2.2E-05	PGA	8.8E-06	6.9E-06	2.2E-05
McGuire 1	05000369	2.8E-05	2.1E-05	8.0E-06	2.3E-06	2.8E-05	PGA	1.5E-05	1.3E-05	2.8E-05
McGuire 2	05000370	2.8E-05	2.1E-05	8.0E-06	2.3E-06	2.8E-05	PGA	1.5E-05	1.3E-05	2.8E-05
Millstone 2	05000336	6.4E-06	4.4E-06	2.2E-06	7.8E-07	6.4E-06	PGA	3.4E-06	3.0E-06	6.4E-06
Millstone 3	05000423	1.0E-05	4.0E-06	2.9E-06	5.8E-07	1.0E-05	PGA	4.4E-06	3.6E-06	1.0E-05
Monticello	05000263	2.6E-05	1.5E-05	5.5E-06	2.6E-07	2.6E-05	PGA	1.2E-05	9.6E-06	2.6E-05
Nine Mile Point 1	05000220	5.8E-07	3.7E-07	1.4E-07	1.2E-07	5.8E-07	PGA	3.0E-07	2.6E-07	5.8E-07
Nine Mile Point 2	05000410	1.0E-06	6.5E-07	2.4E-07	1.9E-07	1.0E-06	PGA	5.2E-07	4.5E-07	1.0E-06
North Anna 1 (1st spectral ratios)	05000338	3.2E-05	2.3E-05	1.1E-05	3.8E-06	3.2E-05	PGA	1.8E-05	1.6E-05	3.2E-05
North Anna 1 (2nd spectral ratios)	05000338	3.2E-05	2.4E-05	1.1E-05	1.8E-06	3.2E-05	PGA	1.7E-05	1.5E-05	3.2E-05
North Anna 2 (1st spectral ratios)	05000339	3.2E-05	2.3E-05	1.1E-05	3.8E-06	3.2E-05	PGA	1.8E-05	1.6E-05	3.2E-05
North Anna 2 (2nd spectral ratios)	05000339	3.2E-05	2.4E-05	1.1E-05	1.8E-06	3.2E-05	PGA	1.7E-05	1.5E-05	3.2E-05
Oconee 1	05000269	6.7E-06	6.6E-06	8.5E-06	1.0E-05	1.0E-05	1 HZ	8.0E-06	8.1E-06	1.0E-05
Oconee 2	05000270	6.7E-06	6.6E-06	8.5E-06	1.0E-05	1.0E-05	1 HZ	8.0E-06	8.1E-06	1.0E-05
Oconee 3	05000287	6.7E-06	6.6E-06	8.5E-06	1.0E-05	1.0E-05	1 HZ	8.0E-06	8.1E-06	1.0E-05
Oyster Creek	05000219	4.1E-06	3.4E-06	7.2E-06	4.8E-06	7.2E-06	5 HZ	4.9E-06	5.0E-06	7.9E-06
Palisades	05000255									
Peach Bottom 2	05000277	8.3E-06	5.8E-06	2.8E-06	8.8E-07	8.3E-06	PGA	4.4E-06	3.9E-06	8.3E-06
Peach Bottom 3	05000278	8.3E-06	5.8E-06	2.8E-06	8.8E-07	8.3E-06	PGA	4.4E-06	3.9E-06	8.3E-06
Perry 1	05000440	8.5E-07	5.4E-07	2.3E-07	6.3E-08	8.5E-07	PGA	4.2E-07	3.6E-07	8.5E-07
Pilgrim 1	05000293	6.8E-06	8.0E-06	4.4E-06	3.4E-06	8.0E-06	10 Hz	5.6E-06	5.5E-06	8.0E-06
Point Beach 1	05000266	1.3E-05	1.2E-05	5.8E-06	3.0E-07	1.3E-05	PGA	7.6E-06	6.9E-06	1.3E-05
Point Beach 2	05000301	1.3E-05	1.2E-05	5.8E-06	3.0E-07	1.3E-05	PGA	7.6E-06	6.9E-06	1.3E-05
Prairie Island 1	05000282	1.3E-06	1.1E-06	4.5E-07	7.0E-09	1.3E-06	PGA	7.3E-07	6.5E-07	1.4E-06

Table D-2. Seismic Core-Damage Frequencies Using 1989 EPRI Seismic Hazard Curves.

Plant Name	Docket Number	EPRI 1989								
		PGA	10 Hz	5 Hz	1 Hz	max	controlling curve	simple average	IPEEE weighted average	weakest link model
Prairie Island 2	05000306	1.3E-06	1.1E-06	4.5E-07	7.0E-09	1.3E-06	PGA	7.3E-07	6.5E-07	1.4E-06
Quad Cities 1	05000254	1.4E-05	9.8E-06	3.6E-06	8.3E-07	1.4E-05	PGA	7.0E-06	6.0E-06	1.4E-05
Quad Cities 2	05000265	1.4E-05	9.8E-06	3.6E-06	8.3E-07	1.4E-05	PGA	7.0E-06	6.0E-06	1.4E-05
River Bend 1	05000458	2.5E-06	1.2E-06	7.2E-07	2.2E-06	2.5E-06	PGA	1.6E-06	1.5E-06	2.7E-06
Robinson 2	05000261	2.2E-06	2.4E-06	2.0E-06	1.7E-06	2.4E-06	10 Hz	2.1E-06	2.0E-06	2.7E-06
Saint Lucie 1 (s4)	05000335									
Saint Lucie 1 (s5)	05000335									
Saint Lucie 2 (s4)	05000389									
Saint Lucie 2 (s5)	05000389									
Salem 1	05000272	4.7E-06	4.6E-06	3.0E-06	4.0E-06	4.7E-06	PGA	4.1E-06	4.0E-06	5.8E-06
Salem 2	05000311	4.7E-06	4.6E-06	3.0E-06	4.0E-06	4.7E-06	PGA	4.1E-06	4.0E-06	5.8E-06
Seabrook 1	05000443	8.7E-06	3.5E-06	2.0E-06	4.5E-07	8.7E-06	PGA	3.7E-06	3.0E-06	8.7E-06
Sequoyah 1	05000327	9.8E-06	6.7E-06	3.4E-06	1.3E-06	9.8E-06	PGA	5.3E-06	4.6E-06	9.8E-06
Sequoyah 2	05000328	9.8E-06	6.7E-06	3.4E-06	1.3E-06	9.8E-06	PGA	5.3E-06	4.6E-06	9.8E-06
South Texas 1	05000498	7.7E-07	3.2E-07	1.9E-07	6.6E-08	7.7E-07	PGA	3.3E-07	2.7E-07	7.7E-07
South Texas 2	05000499	7.7E-07	3.2E-07	1.9E-07	6.6E-08	7.7E-07	PGA	3.3E-07	2.7E-07	7.7E-07
Summer	05000395	7.2E-06	5.2E-06	2.7E-06	1.4E-06	7.2E-06	PGA	4.1E-06	3.7E-06	7.2E-06
Surry 1	05000280	5.6E-06	5.1E-06	7.4E-06	3.8E-06	7.4E-06	5 HZ	5.5E-06	5.5E-06	8.1E-06
Surry 2	05000281	5.6E-06	5.1E-06	7.4E-06	3.8E-06	7.4E-06	5 HZ	5.5E-06	5.5E-06	8.1E-06
Susquehanna 1	05000387	2.4E-06	1.6E-06	7.6E-07	2.4E-07	2.4E-06	PGA	1.3E-06	1.1E-06	2.4E-06
Susquehanna 2	05000388	2.4E-06	1.6E-06	7.6E-07	2.4E-07	2.4E-06	PGA	1.3E-06	1.1E-06	2.4E-06
Three Mile Island 1	05000289	2.2E-05	5.7E-06	4.1E-06	1.3E-06	2.2E-05	PGA	8.2E-06	6.3E-06	2.2E-05
Turkey Point 3	05000250									
Turkey Point 4	05000251									
Vermont Yankee	05000271	2.3E-06	1.6E-06	7.3E-07	3.0E-07	2.3E-06	PGA	1.2E-06	1.1E-06	2.3E-06
Vogtle 1	05000424	2.1E-06	2.2E-06	1.9E-06	1.8E-06	2.2E-06	10 Hz	2.0E-06	1.9E-06	2.6E-06

Table D-2. Seismic Core-Damage Frequencies Using 1989 EPRI Seismic Hazard Curves.

Plant Name	Docket Number	EPRI 1989								
		PGA	10 Hz	5 Hz	1 Hz	max	controlling curve	simple average	IPEEE weighted average	weakest link model
Vogtle 2	05000425	2.1E-06	2.2E-06	1.9E-06	1.8E-06	2.2E-06	10 Hz	2.0E-06	1.9E-06	2.6E-06
Waterford 3	05000382	1.2E-06	9.8E-07	2.5E-07	5.2E-07	1.2E-06	PGA	7.3E-07	6.7E-07	1.2E-06
Watts Bar 1 (rock)	05000390	5.6E-06	3.9E-06	2.0E-06	8.0E-07	5.6E-06	PGA	3.1E-06	2.7E-06	5.6E-06
Watts Bar 1 (soil)	05000390	5.6E-06	4.0E-06	2.0E-06	3.6E-07	5.6E-06	PGA	3.0E-06	2.6E-06	5.6E-06
Wolf Creek 1	05000482	1.8E-06	1.3E-06	4.1E-07	2.5E-06	2.5E-06	1 HZ	1.5E-06	1.4E-06	2.5E-06

Table D-3. Seismic Core-Damage Frequencies Using 1994 LLNL Seismic Hazard Curves.

Plant Name	Docket Number	LLNL 1994								
		PGA	10 Hz	5 Hz	1 Hz	max	controlling curve	simple average	IPEEE weighted average	weakest link model
Arkansas Nuclear 1	05000313	7.8E-06	5.1E-06	5.4E-06	2.5E-06	7.8E-06	PGA	5.2E-06	4.8E-06	7.8E-06
Arkansas Nuclear 2	05000368	7.8E-06	5.1E-06	5.4E-06	2.5E-06	7.8E-06	PGA	5.2E-06	4.8E-06	7.8E-06
Beaver Valley 1	05000334	4.1E-05	4.5E-05	5.6E-05	4.6E-06	5.6E-05	5 HZ	3.6E-05	3.6E-05	5.6E-05
Beaver Valley 2	05000412	2.1E-05	2.2E-05	3.0E-05	2.3E-06	3.0E-05	5 HZ	1.9E-05	1.9E-05	3.0E-05
Braidwood 1	05000456	2.3E-06	1.6E-06	1.5E-06	6.5E-07	2.3E-06	PGA	1.5E-06	1.4E-06	2.3E-06
Braidwood 2	05000457	2.3E-06	1.6E-06	1.5E-06	6.5E-07	2.3E-06	PGA	1.5E-06	1.4E-06	2.3E-06
Browns Ferry 1	05000259	4.0E-06	3.0E-06	2.9E-06	1.4E-06	4.0E-06	PGA	2.8E-06	2.7E-06	4.0E-06
Browns Ferry 2	05000260	6.0E-06	4.6E-06	4.3E-06	2.1E-06	6.0E-06	PGA	4.2E-06	4.0E-06	6.0E-06
Browns Ferry 3	05000296	6.0E-06	4.6E-06	4.3E-06	2.1E-06	6.0E-06	PGA	4.2E-06	4.0E-06	6.0E-06
Brunswick 1	05000325	1.4E-05	1.7E-05	1.1E-05	1.0E-06	1.7E-05	10 Hz	1.1E-05	1.0E-05	1.7E-05
Brunswick 2	05000324	1.4E-05	1.7E-05	1.1E-05	1.0E-06	1.7E-05	10 Hz	1.1E-05	1.0E-05	1.7E-05
Byron 1	05000454	3.1E-06	2.3E-06	2.4E-06	1.0E-06	3.1E-06	PGA	2.2E-06	2.1E-06	3.1E-06
Byron 2	05000455	3.1E-06	2.3E-06	2.4E-06	1.0E-06	3.1E-06	PGA	2.2E-06	2.1E-06	3.1E-06
Callaway	05000483	2.3E-06	1.7E-06	1.8E-06	3.6E-07	2.3E-06	PGA	1.5E-06	1.4E-06	2.3E-06
Calvert Cliffs 1	05000317	1.3E-05	1.2E-05	1.3E-05	1.7E-05	1.7E-05	1 HZ	1.4E-05	1.4E-05	1.7E-05
Calvert Cliffs 2	05000318	1.5E-05	1.4E-05	1.5E-05	1.9E-05	1.9E-05	1 HZ	1.6E-05	1.6E-05	1.9E-05
Catawba 1	05000413	4.3E-05	3.1E-05	2.6E-05	1.0E-05	4.3E-05	PGA	2.8E-05	2.5E-05	4.3E-05
Catawba 2	05000414	4.3E-05	3.1E-05	2.6E-05	1.0E-05	4.3E-05	PGA	2.8E-05	2.5E-05	4.3E-05
Clinton (0098)	05000461	1.3E-05	7.6E-06	1.7E-05	3.6E-06	1.7E-05	5 HZ	1.0E-05	9.9E-06	1.7E-05
Clinton(UHS)	05000461	1.3E-05	9.8E-06	2.4E-05	2.2E-05	2.4E-05	5 HZ	1.7E-05	1.8E-05	2.4E-05
Comanche Peak 1	05000445	6.0E-06	2.6E-06	2.2E-06	6.9E-07	6.0E-06	PGA	2.9E-06	2.4E-06	6.0E-06
Comanche Peak 2	05000446	6.0E-06	2.6E-06	2.2E-06	6.9E-07	6.0E-06	PGA	2.9E-06	2.4E-06	6.0E-06
Cooper	05000298	2.2E-05	1.6E-05	1.4E-05	9.8E-07	2.2E-05	PGA	1.3E-05	1.2E-05	2.2E-05
Crystal River 3	05000302	1.4E-05	2.1E-05	1.5E-05	1.5E-06	2.1E-05	10 Hz	1.3E-05	1.3E-05	2.1E-05
D.C. Cook 1	05000315	1.2E-05	1.1E-05	1.2E-05	4.6E-06	1.2E-05	5 HZ	1.0E-05	9.8E-06	1.2E-05

Table D-3. Seismic Core-Damage Frequencies Using 1994 LLNL Seismic Hazard Curves.

Plant Name	Docket Number	LLNL 1994								
		PGA	10 Hz	5 Hz	1 Hz	max	controlling curve	simple average	IPEEE weighted average	weakest link model
D.C. Cook 2	05000316	1.2E-05	1.1E-05	1.2E-05	4.6E-06	1.2E-05	5 HZ	1.0E-05	9.8E-06	1.2E-05
Davis-Besse	05000346	7.4E-06	5.0E-06	5.5E-06	2.1E-06	7.4E-06	PGA	5.0E-06	4.7E-06	7.4E-06
Dresden 2	05000237	8.4E-06	5.8E-06	5.2E-06	1.9E-06	8.4E-06	PGA	5.3E-06	4.9E-06	8.4E-06
Dresden 3	05000249	8.4E-06	5.8E-06	5.2E-06	1.9E-06	8.4E-06	PGA	5.3E-06	4.9E-06	8.4E-06
Duane Arnold	05000331	7.7E-06	5.7E-06	3.0E-06	1.6E-06	7.7E-06	PGA	4.5E-06	4.1E-06	7.7E-06
Farley 1 (1st spectral ratios)	05000348	1.7E-05	1.3E-05	1.1E-05	4.3E-06	1.7E-05	PGA	1.1E-05	1.0E-05	1.7E-05
Farley 1 (2nd spectral ratios)	05000348	1.7E-05	1.4E-05	1.1E-05	2.3E-06	1.7E-05	PGA	1.1E-05	1.0E-05	1.7E-05
Farley 2 (1st spectral ratios)	05000364	1.7E-05	1.3E-05	1.1E-05	4.3E-06	1.7E-05	PGA	1.1E-05	1.0E-05	1.7E-05
Farley 2 (2nd spectral ratios)	05000364	1.7E-05	1.4E-05	1.1E-05	2.3E-06	1.7E-05	PGA	1.1E-05	1.0E-05	1.7E-05
Fermi 2	05000341	2.4E-06	2.1E-06	2.1E-06	8.7E-07	2.4E-06	PGA	1.9E-06	1.8E-06	2.4E-06
FitzPatrick	05000333	6.0E-06	2.1E-05	4.8E-06	1.8E-06	2.1E-05	10 Hz	8.5E-06	8.8E-06	1.5E-05
Fort Calhoun	05000285	2.7E-05	3.5E-05	1.9E-05	3.1E-06	3.5E-05	10 Hz	2.1E-05	2.0E-05	3.5E-05
Ginna	05000244	1.5E-05	7.7E-06	7.5E-06	1.7E-06	1.5E-05	PGA	8.1E-06	7.1E-06	1.5E-05
Grand Gulf 1	05000416	1.2E-05	8.6E-06	1.4E-05	1.2E-05	1.4E-05	5 HZ	1.2E-05	1.2E-05	1.4E-05
Harris 1	05000400	3.0E-06	1.9E-06	1.9E-06	7.8E-07	3.0E-06	PGA	1.9E-06	1.7E-06	3.0E-06
Hatch 1	05000321	5.0E-06	2.2E-06	2.0E-05	3.8E-06	2.0E-05	5 HZ	7.7E-06	8.1E-06	1.7E-05
Hatch 2	05000366	5.0E-06	2.2E-06	2.0E-05	3.8E-06	2.0E-05	5 HZ	7.7E-06	8.1E-06	1.7E-05
Hope Creek 1	05000354	3.6E-06	1.3E-06	1.7E-06	2.3E-06	3.6E-06	PGA	2.2E-06	2.0E-06	3.6E-06
Indian Point 2	05000247	1.1E-05	1.1E-05	2.7E-05	1.8E-05	2.7E-05	5 HZ	1.7E-05	1.8E-05	2.6E-05
Indian Point 3	05000286	5.2E-05	5.5E-05	5.7E-05	1.7E-05	5.7E-05	5 HZ	4.5E-05	4.4E-05	5.8E-05
Kewaunee	05000305	1.2E-05	1.1E-05	1.4E-05	6.5E-06	1.4E-05	5 HZ	1.1E-05	1.1E-05	1.4E-05
La Salle 1 (0098)	05000373	2.8E-06	2.3E-06	2.9E-06	4.2E-07	2.9E-06	5 HZ	2.1E-06	2.0E-06	2.9E-06
La Salle 1 (SSE)	05000373	2.8E-06	2.3E-06	1.8E-06	4.3E-07	2.8E-06	PGA	1.8E-06	1.7E-06	2.7E-06
La Salle 1 (UHS)	05000373	2.8E-06	3.0E-06	4.1E-06	8.8E-07	4.1E-06	5 HZ	2.7E-06	2.7E-06	4.0E-06
La Salle 2 (0098)	05000374	2.8E-06	2.3E-06	2.9E-06	4.2E-07	2.9E-06	5 HZ	2.1E-06	2.0E-06	2.9E-06
La Salle 2 (SSE)	05000374	2.8E-06	2.3E-06	1.8E-06	4.3E-07	2.8E-06	PGA	1.8E-06	1.7E-06	2.7E-06

Table D-3. Seismic Core-Damage Frequencies Using 1994 LLNL Seismic Hazard Curves.

Plant Name	Docket Number	LLNL 1994								
		PGA	10 Hz	5 Hz	1 Hz	max	controlling curve	simple average	IPEEE weighted average	weakest link model
La Salle 2 (UHS)	05000374	2.8E-06	3.0E-06	4.1E-06	8.8E-07	4.1E-06	5 HZ	2.7E-06	2.7E-06	4.0E-06
Limerick 1	05000352	4.8E-05	1.4E-05	1.8E-05	6.3E-06	4.8E-05	PGA	2.1E-05	1.8E-05	4.8E-05
Limerick 2	05000353	4.8E-05	1.4E-05	1.8E-05	6.3E-06	4.8E-05	PGA	2.1E-05	1.8E-05	4.8E-05
McGuire 1	05000369	4.7E-05	3.4E-05	2.3E-05	6.8E-06	4.7E-05	PGA	2.8E-05	2.5E-05	4.7E-05
McGuire 2	05000370	4.7E-05	3.4E-05	2.3E-05	6.8E-06	4.7E-05	PGA	2.8E-05	2.5E-05	4.7E-05
Millstone 2	05000336	1.1E-05	9.4E-06	8.8E-06	3.6E-06	1.1E-05	PGA	8.2E-06	7.8E-06	1.1E-05
Millstone 3	05000423	1.7E-05	8.6E-06	1.1E-05	2.8E-06	1.7E-05	PGA	9.8E-06	8.8E-06	1.7E-05
Monticello	05000263	3.2E-05	2.1E-05	1.4E-05	4.5E-06	3.2E-05	PGA	1.8E-05	1.6E-05	3.1E-05
Nine Mile Point 1	05000220	3.5E-06	2.6E-06	2.8E-06	1.1E-06	3.5E-06	PGA	2.5E-06	2.3E-06	3.5E-06
Nine Mile Point 2	05000410	5.4E-06	4.1E-06	4.3E-06	1.6E-06	5.4E-06	PGA	3.9E-06	3.6E-06	5.4E-06
North Anna 1 (1st spectral ratios)	05000338	3.6E-05	2.0E-05	1.7E-05	6.4E-06	3.6E-05	PGA	2.0E-05	1.8E-05	3.6E-05
North Anna 1 (2nd spectral ratios)	05000338	3.6E-05	2.1E-05	1.7E-05	3.1E-06	3.6E-05	PGA	1.9E-05	1.7E-05	3.6E-05
North Anna 2 (1st spectral ratios)	05000339	3.6E-05	2.0E-05	1.7E-05	6.4E-06	3.6E-05	PGA	2.0E-05	1.8E-05	3.6E-05
North Anna 2 (2nd spectral ratios)	05000339	3.6E-05	2.1E-05	1.7E-05	3.1E-06	3.6E-05	PGA	1.9E-05	1.7E-05	3.6E-05
Oconee 1	05000269	1.0E-05	8.9E-06	1.9E-05	2.1E-05	2.1E-05	1 HZ	1.5E-05	1.6E-05	2.1E-05
Oconee 2	05000270	1.0E-05	8.9E-06	1.9E-05	2.1E-05	2.1E-05	1 HZ	1.5E-05	1.6E-05	2.1E-05
Oconee 3	05000287	1.0E-05	8.9E-06	1.9E-05	2.1E-05	2.1E-05	1 HZ	1.5E-05	1.6E-05	2.1E-05
Oyster Creek	05000219	1.5E-05	6.2E-06	1.8E-05	1.4E-05	1.8E-05	5 HZ	1.4E-05	1.3E-05	1.8E-05
Palisades	05000255	1.0E-05	8.0E-06	1.0E-05	2.9E-06	1.0E-05	5 HZ	7.8E-06	7.5E-06	1.0E-05
Peach Bottom 2	05000277	2.1E-05	1.5E-05	1.4E-05	5.6E-06	2.1E-05	PGA	1.4E-05	1.3E-05	2.1E-05
Peach Bottom 3	05000278	2.1E-05	1.5E-05	1.4E-05	5.6E-06	2.1E-05	PGA	1.4E-05	1.3E-05	2.1E-05
Perry 1	05000440	2.7E-06	1.9E-06	2.0E-06	8.3E-07	2.7E-06	PGA	1.8E-06	1.7E-06	2.7E-06
Pilgrim 1	05000293	1.1E-04	1.1E-04	1.1E-04	3.7E-05	1.1E-04	PGA	9.2E-05	8.9E-05	1.1E-04
Point Beach 1	05000266	1.3E-05	1.2E-05	1.5E-05	2.6E-06	1.5E-05	5 HZ	1.1E-05	1.0E-05	1.5E-05
Point Beach 2	05000301	1.3E-05	1.2E-05	1.5E-05	2.6E-06	1.5E-05	5 HZ	1.1E-05	1.0E-05	1.5E-05
Prairie Island 1	05000282	6.1E-06	4.2E-06	4.9E-06	3.5E-07	6.1E-06	PGA	3.9E-06	3.6E-06	6.0E-06

Table D-3. Seismic Core-Damage Frequencies Using 1994 LLNL Seismic Hazard Curves.

Plant Name	Docket Number	LLNL 1994								
		PGA	10 Hz	5 Hz	1 Hz	max	controlling curve	simple average	IPEEE weighted average	weakest link model
Prairie Island 2	05000306	6.1E-06	4.2E-06	4.9E-06	3.5E-07	6.1E-06	PGA	3.9E-06	3.6E-06	6.0E-06
Quad Cities 1	05000254	3.3E-05	2.8E-05	2.5E-05	8.9E-06	3.3E-05	PGA	2.4E-05	2.3E-05	3.3E-05
Quad Cities 2	05000265	3.3E-05	2.8E-05	2.5E-05	8.9E-06	3.3E-05	PGA	2.4E-05	2.3E-05	3.3E-05
River Bend 1	05000458	1.7E-05	8.6E-06	1.2E-05	6.6E-06	1.7E-05	PGA	1.1E-05	1.0E-05	1.7E-05
Robinson 2	05000261	3.8E-05	2.0E-05	5.8E-05	3.1E-05	5.8E-05	5 HZ	3.7E-05	3.7E-05	5.7E-05
Saint Lucie 1 (s4)	05000335	1.6E-05	1.8E-05	2.4E-05	1.3E-05	2.4E-05	5 HZ	1.8E-05	1.8E-05	2.4E-05
Saint Lucie 1 (s5)	05000335	1.6E-05	1.8E-05	2.4E-05	1.3E-05	2.4E-05	5 HZ	1.8E-05	1.8E-05	2.4E-05
Saint Lucie 2 (s4)	05000389	1.6E-05	1.8E-05	2.4E-05	1.3E-05	2.4E-05	5 HZ	1.8E-05	1.8E-05	2.4E-05
Saint Lucie 2 (s5)	05000389	1.6E-05	1.8E-05	2.4E-05	1.3E-05	2.4E-05	5 HZ	1.8E-05	1.8E-05	2.4E-05
Salem 1	05000272	9.5E-06	4.2E-06	4.8E-06	9.7E-06	9.7E-06	1 HZ	7.0E-06	6.7E-06	1.1E-05
Salem 2	05000311	9.5E-06	4.2E-06	4.8E-06	9.7E-06	9.7E-06	1 HZ	7.0E-06	6.7E-06	1.1E-05
Seabrook 1	05000443	1.6E-05	4.8E-06	4.8E-06	1.2E-06	1.6E-05	PGA	6.8E-06	5.4E-06	1.6E-05
Sequoyah 1	05000327	1.2E-05	7.2E-06	6.3E-06	2.5E-06	1.2E-05	PGA	6.9E-06	6.2E-06	1.2E-05
Sequoyah 2	05000328	1.2E-05	7.2E-06	6.3E-06	2.5E-06	1.2E-05	PGA	6.9E-06	6.2E-06	1.2E-05
South Texas 1	05000498	1.0E-05	3.0E-06	4.6E-06	3.4E-06	1.0E-05	PGA	5.4E-06	4.6E-06	1.0E-05
South Texas 2	05000499	1.0E-05	3.0E-06	4.6E-06	3.4E-06	1.0E-05	PGA	5.4E-06	4.6E-06	1.0E-05
Summer	05000395	2.3E-05	2.1E-05	2.3E-05	1.0E-05	2.3E-05	5 HZ	1.9E-05	1.9E-05	2.3E-05
Surry 1	05000280	1.1E-05	5.9E-06	9.0E-06	7.2E-06	1.1E-05	PGA	8.3E-06	7.9E-06	1.1E-05
Surry 2	05000281	1.1E-05	5.9E-06	9.0E-06	7.2E-06	1.1E-05	PGA	8.3E-06	7.9E-06	1.1E-05
Susquehanna 1	05000387	1.4E-05	8.7E-06	8.1E-06	3.3E-06	1.4E-05	PGA	8.4E-06	7.7E-06	1.4E-05
Susquehanna 2	05000388	1.4E-05	8.7E-06	8.1E-06	3.3E-06	1.4E-05	PGA	8.4E-06	7.7E-06	1.4E-05
Three Mile Island 1	05000289	6.7E-05	2.0E-05	2.8E-05	1.1E-05	6.7E-05	PGA	3.1E-05	2.6E-05	6.7E-05
Turkey Point 3	05000250	5.1E-06	7.3E-06	5.1E-06	1.5E-06	7.3E-06	10 Hz	4.8E-06	4.7E-06	7.3E-06
Turkey Point 4	05000251	5.1E-06	7.3E-06	5.1E-06	1.5E-06	7.3E-06	10 Hz	4.8E-06	4.7E-06	7.3E-06
Vermont Yankee	05000271	1.2E-05	8.7E-06	8.3E-06	3.3E-06	1.2E-05	PGA	8.0E-06	7.5E-06	1.2E-05
Vogtle 1	05000424	2.0E-05	9.2E-06	1.9E-05	1.1E-05	2.0E-05	PGA	1.5E-05	1.4E-05	2.0E-05

Table D-3. Seismic Core-Damage Frequencies Using 1994 LLNL Seismic Hazard Curves.										
Plant Name	Docket Number	LLNL 1994								
		PGA	10 Hz	5 Hz	1 Hz	max	controlling curve	simple average	IPEEE weighted average	weakest link model
Vogtle 2	05000425	2.0E-05	9.2E-06	1.9E-05	1.1E-05	2.0E-05	PGA	1.5E-05	1.4E-05	2.0E-05
Waterford 3	05000382	2.9E-05	1.8E-05	1.7E-05	1.3E-05	2.9E-05	PGA	1.9E-05	1.8E-05	2.9E-05
Watts Bar 1 (rock)	05000390	8.3E-06	5.4E-06	4.9E-06	1.9E-06	8.3E-06	PGA	5.1E-06	4.7E-06	8.3E-06
Watts Bar 1 (soil)	05000390	8.3E-06	5.6E-06	4.9E-06	8.7E-07	8.3E-06	PGA	4.9E-06	4.4E-06	8.3E-06
Wolf Creek 1	05000482	4.3E-06	2.6E-06	2.0E-06	8.9E-06	8.9E-06	1 HZ	4.4E-06	4.5E-06	8.9E-06

Table D-4. IPEEE SPRA Results and SPAR Model Results.					
Plant Name	Docket Number	IPEEE SPRA Results			Internal Events CDF SPAR
		EPRI	LLNL	Plant Specific Hazard	
Arkansas Nuclear 1	05000313				9.9E-06
Arkansas Nuclear 2	05000368				3.3E-06
Beaver Valley 1	05000334	1.3E-05			8.4E-05
Beaver Valley 2	05000412	1.0E-05			3.5E-05
Braidwood 1	05000456				3.6E-05
Braidwood 2	05000457				3.6E-05
Browns Ferry 1	05000259				1.1E-06
Browns Ferry 2	05000260				1.0E-06
Browns Ferry 3	05000296				3.2E-06
Brunswick 1	05000325				1.6E-05
Brunswick 2	05000324				9.7E-06
Byron 1	05000454				3.5E-05
Byron 2	05000455				3.5E-05
Callaway	05000483				5.0E-05
Calvert Cliffs 1	05000317		1.3E-05		2.3E-05
Calvert Cliffs 2	05000318		1.5E-05		2.1E-05
Catawba 1	05000413	1.6E-05			3.5E-05
Catawba 2	05000414	1.6E-05			3.5E-05
Clinton (0098)	05000461				7.8E-06
Clinton(UHS)	05000461				7.8E-06
Comanche Peak 1	05000445				1.8E-05
Comanche Peak 2	05000446				1.8E-05
Cooper	05000298				7.8E-06
Crystal River 3	05000302				1.1E-05
D.C. Cook 1	05000315			3.2E-06	6.3E-05
D.C. Cook 2	05000316			3.2E-06	6.3E-05
Davis-Besse	05000346				5.6E-06
Dresden 2	05000237				7.1E-07
Dresden 3	05000249				7.1E-07
Duane Arnold	05000331				5.3E-06
Farley 1 (1st spectral ratios)	05000348				1.9E-04
Farley 1 (2nd spectral ratios)	05000348				1.9E-04
Farley 2 (1st spectral ratios)	05000364				1.9E-04
Farley 2 (2nd spectral ratios)	05000364				1.9E-04
Fermi 2	05000341				1.7E-05
FitzPatrick	05000333				4.3E-06
Fort Calhoun	05000285				1.3E-05
GINNA	05000244				1.3E-05

Table D-4. IPEEE SPRA Results and SPAR Model Results.					
Plant Name	Docket Number	IPEEE SPRA Results			Internal Events CDF SPAR
		EPRI	LLNL	Plant Specific Hazard	
Grand Gulf 1	05000416				3.8E-06
Harris 1	05000400				2.9E-05
Hatch 1	05000321				9.1E-06
Hatch 2	05000366				9.1E-06
Hope Creek 1	05000354	1.0E-06	3.6E-06		8.2E-06
Indian Point 2	05000247		1.1E-05		9.6E-06
Indian Point 3	05000286	5.9E-05	4.9E-05		1.0E-05
Kewaunee	05000305	1.1E-05	1.3E-05		1.2E-05
La Salle 1 (0098)	05000373			6.0E-07	6.1E-06
La Salle 1 (SSE)	05000373			6.0E-07	6.1E-06
La Salle 1 (UHS)	05000373			6.0E-07	6.1E-06
La Salle 2 (0098)	05000374			6.0E-07	6.1E-06
La Salle 2 (SSE)	05000374			6.0E-07	6.1E-06
La Salle 2 (UHS)	05000374			6.0E-07	6.1E-06
Limerick 1	05000352				2.6E-06
Limerick 2	05000353				2.6E-06
McGuire 1	05000369	1.1E-05			2.7E-05
McGuire 2	05000370	1.1E-05			2.7E-05
Millstone 2	05000336				4.9E-06
Millstone 3	05000423			9.1E-06	5.3E-06
Monticello	05000263				2.0E-06
Nine Mile Point 1	05000220				3.3E-06
Nine Mile Point 2	05000410				1.4E-05
North Anna 1 (1st spectral ratios)	05000338				2.9E-05
North Anna 1 (2nd spectral ratios)	05000338				2.9E-05
North Anna 2 (1st spectral ratios)	05000339				2.9E-05
North Anna 2 (2nd spectral ratios)	05000339				2.9E-05
Oconee 1	05000269	3.5E-05			9.6E-06
Oconee 2	05000270	3.5E-05			9.6E-06
Oconee 3	05000287	3.5E-05			9.6E-06
Oyster Creek	05000219	4.7E-06			1.9E-05
Palisades	05000255		8.9E-06		3.2E-05
Peach Bottom 2	05000277				2.9E-06
Peach Bottom 3	05000278				1.8E-06
Perry 1	05000440				3.3E-06
Pilgrim 1	05000293	5.8E-05	9.4E-05		1.4E-05
Point Beach 1	05000266	1.4E-05	1.3E-05		2.7E-04
Point Beach 2	05000301	1.4E-05	1.3E-05		2.7E-04
Prairie Island 1	05000282				7.2E-06

Table D-4. IPEEE SPRA Results and SPAR Model Results.					
Plant Name	Docket Number	IPEEE SPRA Results			Internal Events CDF SPAR
		EPRI	LLNL	Plant Specific Hazard	
Prairie Island 2	05000306				7.2E-06
Quad Cities 1	05000254				5.0E-06
Quad Cities 2	05000265				5.0E-06
River Bend 1	05000458				4.9E-06
Robinson 2	05000261				1.8E-05
Saint Lucie 1 (s4)	05000335				4.4E-06
Saint Lucie 1 (s5)	05000335				4.4E-06
Saint Lucie 2 (s4)	05000389				3.5E-06
Saint Lucie 2 (s5)	05000389				3.5E-06
Salem 1	05000272	4.7E-06	9.5E-06		3.5E-05
Salem 2	05000311	4.7E-06	9.5E-06		3.5E-05
Seabrook 1	05000443				1.8E-05
Sequoyah 1	05000327				4.6E-05
Sequoyah 2	05000328				4.6E-05
South Texas 1	05000498		1.7E-05		7.9E-06
South Texas 2	05000499		1.7E-05		7.9E-06
Summer	05000395				5.1E-05
Surry 1	05000280	8.2E-06			3.6E-06
Surry 2	05000281	8.2E-06			3.6E-06
Susquehanna 1	05000387				3.0E-06
Susquehanna 2	05000388				6.9E-07
Three Mile Island 1	05000289	3.2E-05	8.4E-05		1.6E-05
Turkey Point 3	05000250				2.1E-06
Turkey Point 4	05000251				2.1E-06
Vermont Yankee	05000271				5.9E-06
Vogtle 1	05000424				4.2E-05
Vogtle 2	05000425				4.2E-05
Waterford 3	05000382				1.1E-05
Watts Bar 1 (rock)	05000390				3.2E-05
Watts Bar 1 (soil)	05000390				3.2E-05
Wolf Creek 1	05000482				2.0E-05