

PMLevyCOLPEm Resource

From: Kitchen, Robert [robert.kitchen@pgnmail.com]
Sent: Sunday, July 08, 2012 7:50 PM
To: Habib, Donald
Cc: Waters, David; Keenan, Christopher; NPD Document Control Inbox
Subject: FW: Digitized CEUS SSC FIRS and revised FSAR Figures 2.5.2-355, -357, and -358
Attachments: FSAR_Table_2_5_2-236_DRAFT.pdf; LNP_FSAR_Rev5_FIG02_05_02_357_DRAFT.pdf; LNP_FSAR_Rev5_FIG02_05_02_358_DRAFT.pdf; LNP_FSAR_Rev5_FIG02_05_02_355_DRAFT.pdf

Don – Attached is the following DRAFT information for discussion at the next Levy COLA public call:

- FSAR Table 2.5.2 – 236 with digitized CEUS FIRS
- FSAR Figures 2.5.2 - 355, 357, and 358. Revised draft figures show the unscaled Updated EPRI SOG GMRS, PBSRS, and FIRS respectively.

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Subject: FW: Digitized CEUS SSC FIRS and revised FSAR Figures 2.5.2-355, -357, and -358
Sent Date: 7/8/2012 7:50:14 PM
Received Date: 7/8/2012 7:50:26 PM
From: Kitchen, Robert

Created By: robert.kitchen@pgnmail.com

Recipients:

"Waters, David" <David.Waters@pgnmail.com>

Tracking Status: None

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Files	Size	Date & Time
MESSAGE	316	7/8/2012 7:50:26 PM
FSAR_Table_2_5_2-236_DRAFT.pdf		538667
LNP_FSAR_Rev5_FIG02_05_02_357_DRAFT.pdf		85723
LNP_FSAR_Rev5_FIG02_05_02_358_DRAFT.pdf		85093
LNP_FSAR_Rev5_FIG02_05_02_355_DRAFT.pdf		85847

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Table 2.5.2-236 (Sheet 1 of 3)
Comparison of Updated EPRI-SOG Scaled Reactor Building FIRS with CAV and
CEUS Reactor Building FIRS with Modified CAV

Frequency (Hz)	5% Damped Horizontal Spectral Acceleration (g)			5% Damped Vertical Spectral Acceleration (g)		
	Scaled FIRS Based on Updated EPRI-SOG Model with Full CAV	FIRS Based on CEUS SSC Model with Modified CAV	Percent Difference	Scaled FIRS Based on Updated EPRI-SOG Model with Full CAV	FIRS Based on CEUS SSC Model with Modified CAV	Percent Difference
100.0000	0.1000	0.0784	-21.6%	0.0695	0.0545	-21.6%
60.2410	0.1231	0.0987	-19.8%	0.0910	0.0730	-19.8%
50.0000	0.1408	0.1125	-20.1%	0.1083	0.0865	-20.1%
40.0000	0.1574	0.1248	-20.7%	0.1256	0.0996	-20.7%
33.3333	0.1739	0.1370	-21.2%	0.1434	0.1130	-21.2%
30.3030	0.1812	0.1424	-21.4%	0.1502	0.1180	-21.4%
25.0000	0.2080	0.1619	-22.1%	0.1692	0.1317	-22.1%
23.8095	0.2129	0.1659	-22.1%	0.1720	0.1340	-22.1%
22.7273	0.2177	0.1698	-22.0%	0.1728	0.1347	-22.0%
21.7391	0.2224	0.1736	-22.0%	0.1736	0.1355	-22.0%
20.8333	0.2270	0.1773	-21.9%	0.1743	0.1361	-21.9%
20.0000	0.2314	0.1809	-21.8%	0.1750	0.1368	-21.8%
18.1818	0.2388	0.1869	-21.7%	0.1738	0.1360	-21.7%
16.6667	0.2457	0.1925	-21.6%	0.1719	0.1347	-21.6%
15.3846	0.2522	0.1978	-21.6%	0.1708	0.1340	-21.6%
14.2857	0.2549	0.2007	-21.3%	0.1686	0.1327	-21.3%
13.3333	0.2576	0.2032	-21.1%	0.1667	0.1315	-21.1%
12.5000	0.2588	0.2048	-20.8%	0.1647	0.1303	-20.8%
11.7647	0.2599	0.2066	-20.5%	0.1628	0.1294	-20.5%
11.1111	0.2610	0.2083	-20.2%	0.1610	0.1286	-20.2%
10.5263	0.2620	0.2099	-19.9%	0.1598	0.1281	-19.9%
10.0000	0.2630	0.2115	-19.6%	0.1587	0.1276	-19.6%
9.0909	0.2652	0.2151	-18.9%	0.1574	0.1277	-18.9%
8.3333	0.2672	0.2186	-18.2%	0.1567	0.1282	-18.2%
7.6923	0.2691	0.2217	-17.6%	0.1563	0.1288	-17.6%
7.1429	0.2708	0.2247	-17.0%	0.1565	0.1299	-17.0%
6.6667	0.2724	0.2275	-16.5%	0.1567	0.1309	-16.5%
6.2500	0.2745	0.2302	-16.1%	0.1572	0.1318	-16.1%
5.8824	0.2764	0.2321	-16.0%	0.1576	0.1324	-16.0%
5.5556	0.2786	0.2341	-16.0%	0.1583	0.1330	-16.0%
5.2632	0.2755	0.2318	-15.9%	0.1560	0.1312	-15.9%
5.0000	0.2726	0.2297	-15.7%	0.1543	0.1300	-15.7%
4.5455	0.2606	0.2205	-15.4%	0.1475	0.1248	-15.4%
4.1667	0.2501	0.2124	-15.1%	0.1415	0.1202	-15.1%
3.8462	0.2407	0.2052	-14.7%	0.1363	0.1162	-14.7%
3.5714	0.2324	0.1988	-14.5%	0.1315	0.1125	-14.5%

Table 2.5.2-236 (Sheet 2 of 3)
Comparison of Updated EPRI-SOG Scaled Reactor Building FIRS with CAV and
CEUS Reactor Building FIRS with Modified CAV

Frequency (Hz)	5% Damped Horizontal Spectral Acceleration (g)			5% Damped Vertical Spectral Acceleration (g)		
	Scaled FIRS Based on Updated EPRI-SOG Model with Full CAV	FIRS Based on CEUS SSC Model with Modified CAV	Percent Difference	Scaled FIRS Based on Updated EPRI-SOG Model with Full CAV	FIRS Based on CEUS SSC Model with Modified CAV	Percent Difference
3.3333	0.2249	0.1930	-14.2%	0.1277	0.1096	-14.2%
3.1250	0.2181	0.1877	-13.9%	0.1243	0.1070	-13.9%
2.9412	0.2120	0.1829	-13.7%	0.1212	0.1046	-13.7%
2.7778	0.2063	0.1788	-13.3%	0.1183	0.1026	-13.3%
2.6316	0.2011	0.1751	-12.9%	0.1157	0.1007	-12.9%
2.5000	0.1962	0.1716	-12.6%	0.1133	0.0991	-12.6%
2.3810	0.1917	0.1682	-12.3%	0.1112	0.0976	-12.3%
2.2727	0.1874	0.1650	-12.0%	0.1092	0.0961	-12.0%
2.1739	0.1835	0.1620	-11.7%	0.1073	0.0947	-11.7%
2.0833	0.1798	0.1592	-11.4%	0.1055	0.0935	-11.4%
2.0000	0.1763	0.1566	-11.2%	0.1039	0.0923	-11.2%
1.8182	0.1684	0.1506	-10.6%	0.1002	0.0896	-10.6%
1.6667	0.1615	0.1453	-10.0%	0.0965	0.0869	-10.0%
1.5385	0.1578	0.1424	-9.8%	0.0950	0.0857	-9.8%
1.4286	0.1523	0.1376	-9.7%	0.0926	0.0837	-9.7%
1.3333	0.1425	0.1292	-9.3%	0.0872	0.0791	-9.3%
1.2500	0.1339	0.1215	-9.2%	0.0824	0.0748	-9.2%
1.1765	0.1262	0.1148	-9.1%	0.0781	0.0711	-9.1%
1.1111	0.1194	0.1088	-8.9%	0.0743	0.0677	-8.9%
1.0526	0.1134	0.1034	-8.8%	0.0709	0.0646	-8.8%
1.0000	0.1079	0.0985	-8.7%	0.0677	0.0618	-8.7%
0.9091	0.1005	0.0915	-9.0%	0.0633	0.0576	-9.0%
0.8333	0.0943	0.0855	-9.3%	0.0594	0.0539	-9.3%
0.7692	0.0888	0.0804	-9.5%	0.0561	0.0507	-9.5%
0.7143	0.0841	0.0759	-9.8%	0.0532	0.0480	-9.8%
0.6667	0.0799	0.0719	-10.0%	0.0506	0.0455	-10.0%
0.6250	0.0762	0.0684	-10.2%	0.0483	0.0434	-10.2%
0.5882	0.0728	0.0653	-10.4%	0.0462	0.0414	-10.4%
0.5556	0.0698	0.0624	-10.5%	0.0444	0.0397	-10.5%
0.5263	0.0671	0.0599	-10.7%	0.0427	0.0381	-10.7%
0.5000	0.0646	0.0575	-10.9%	0.0411	0.0367	-10.9%
0.4545	0.0556	0.0495	-11.0%	0.0354	0.0315	-11.0%
0.4167	0.0486	0.0432	-11.2%	0.0310	0.0275	-11.2%
0.3846	0.0429	0.0381	-11.3%	0.0273	0.0242	-11.3%
0.3571	0.0382	0.0339	-11.4%	0.0243	0.0216	-11.4%
0.3333	0.0343	0.0304	-11.5%	0.0219	0.0193	-11.5%

Table 2.5.2-236 (Sheet 3 of 3)
Comparison of Updated EPRI-SOG Scaled Reactor Building FIRS with CAV and
CEUS Reactor Building FIRS with Modified CAV

Frequency (Hz)	5% Damped Horizontal Spectral Acceleration (g)			5% Damped Vertical Spectral Acceleration (g)		
	Scaled FIRS Based on Updated EPRI-SOG Model with Full CAV	FIRS Based on CEUS SSC Model with Modified CAV	Percent Difference	Scaled FIRS Based on Updated EPRI-SOG Model with Full CAV	FIRS Based on CEUS SSC Model with Modified CAV	Percent Difference
0.3125	0.0311	0.0275	-11.6%	0.0198	0.0175	-11.6%
0.2941	0.0284	0.0251	-11.7%	0.0181	0.0160	-11.7%
0.2778	0.0261	0.0230	-11.8%	0.0166	0.0147	-11.8%
0.2632	0.0242	0.0213	-11.9%	0.0154	0.0136	-11.9%
0.2500	0.0224	0.0197	-12.0%	0.0143	0.0126	-12.0%
0.2381	0.0209	0.0184	-12.0%	0.0133	0.0117	-12.0%
0.2273	0.0196	0.0172	-12.1%	0.0125	0.0109	-12.1%
0.2174	0.0184	0.0161	-12.2%	0.0117	0.0103	-12.2%
0.2083	0.0173	0.0152	-12.3%	0.0110	0.0097	-12.3%
0.2000	0.0163	0.0143	-12.3%	0.0104	0.0091	-12.3%
0.1818	0.0142	0.0124	-12.5%	0.0091	0.0079	-12.5%
0.1667	0.0125	0.0110	-12.6%	0.0080	0.0070	-12.6%
0.1538	0.0112	0.0097	-12.7%	0.0071	0.0062	-12.7%
0.1429	0.0100	0.0087	-12.8%	0.0064	0.0056	-12.8%
0.1333	0.0091	0.0079	-13.0%	0.0058	0.0050	-13.0%
0.1250	0.0082	0.0072	-13.1%	0.0052	0.0046	-13.1%
0.1176	0.0075	0.0065	-13.1%	0.0048	0.0042	-13.1%
0.1111	0.0069	0.0060	-13.2%	0.0044	0.0038	-13.2%
0.1000	0.0059	0.0051	-13.4%	0.0037	0.0032	-13.4%

CAV cumulative absolute velocity

CEUS central and eastern United States

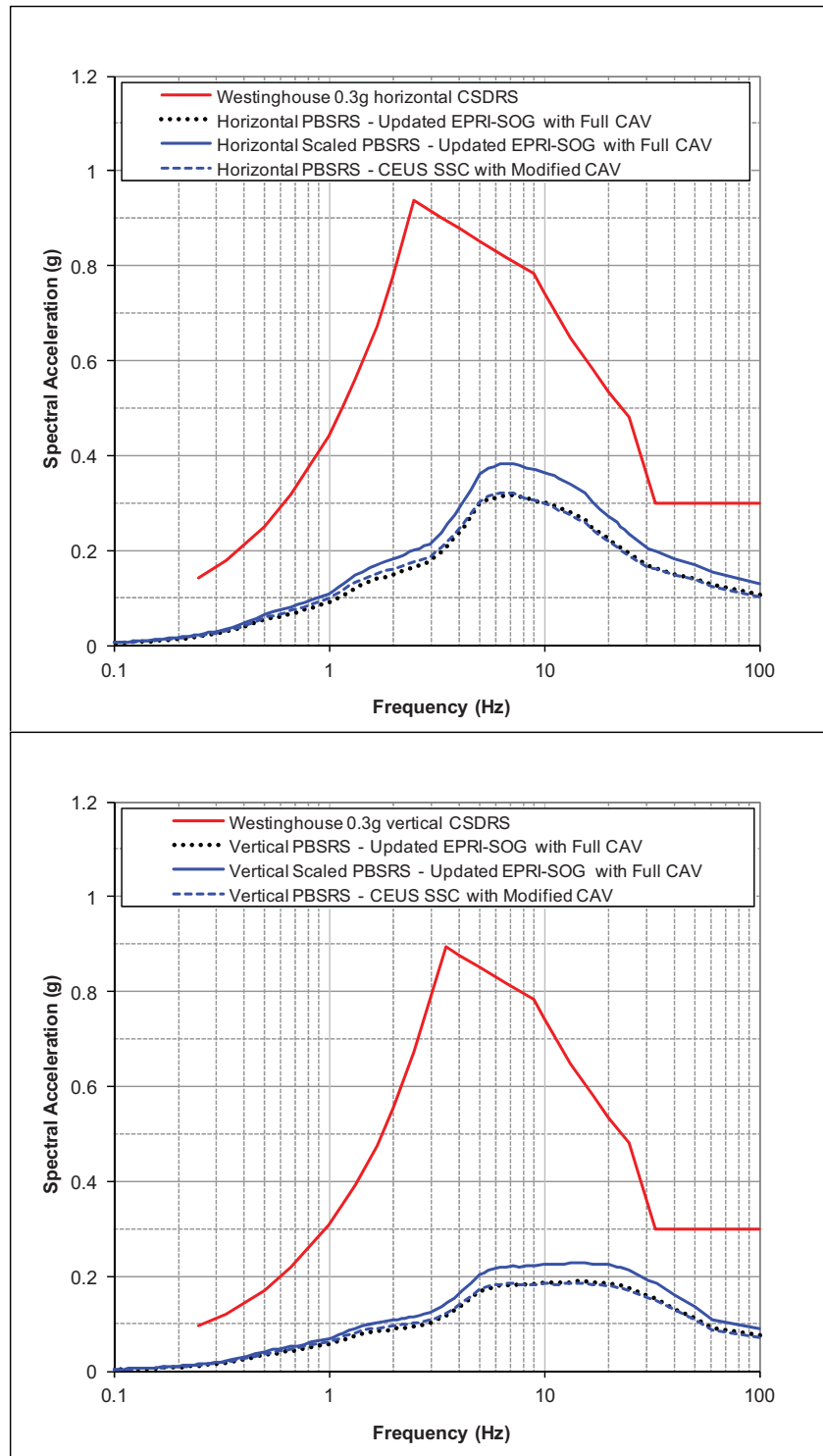
EPRI-SOG Electric Power Research Institute and Seismic Owners Group

g unit of measure of acceleration of gravity

Hz hertz

FIRS foundation input response spectra

SSC Seismic Source Characterization



Note: 5 percent damping

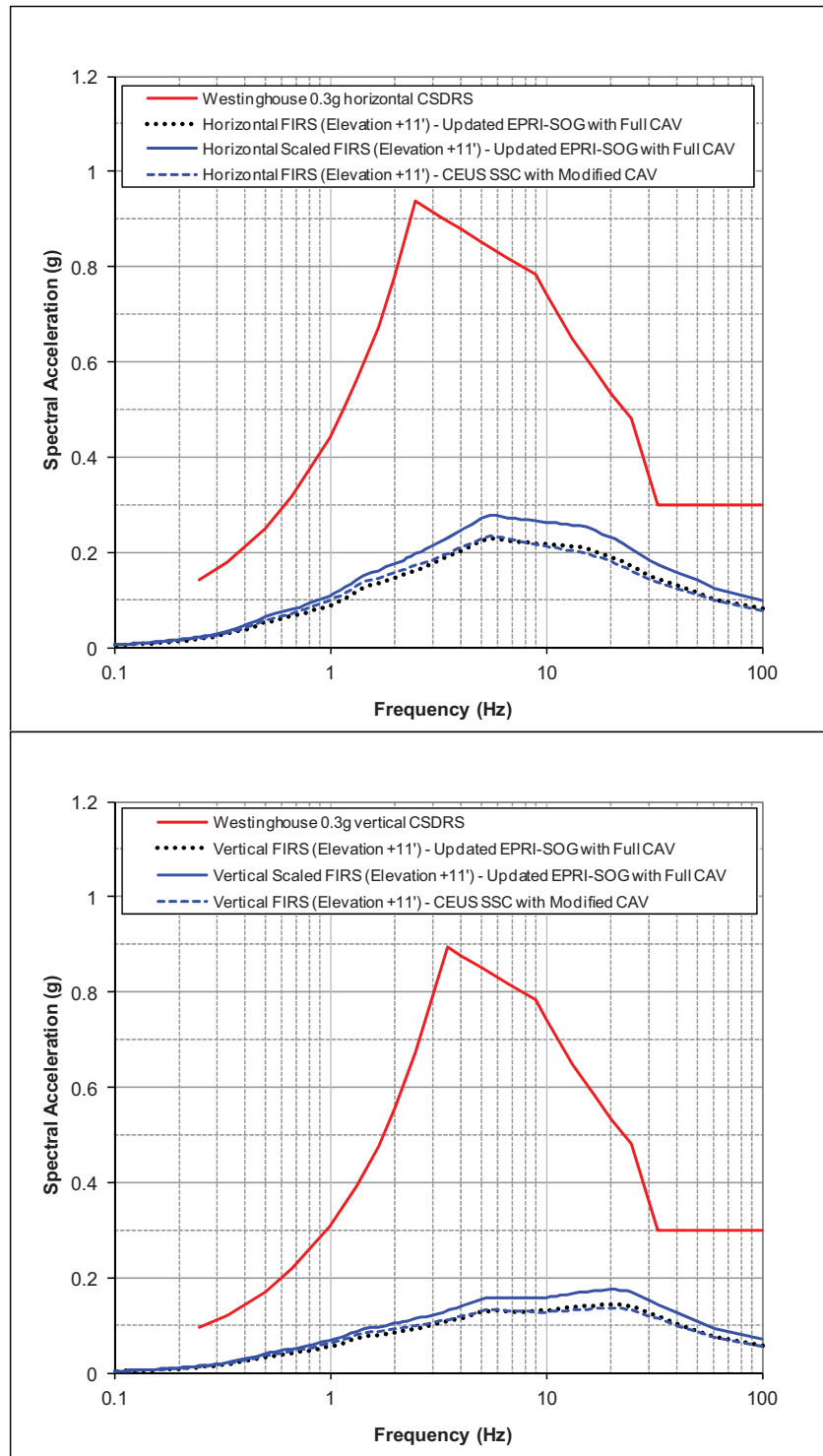
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**Levy Nuclear Plant
Units 1 and 2
Part 2, Final Safety Analysis Report**

Comparison of PBSRS Based on the
Updated EPRI-SOG and CEUS SSC
Models

FIGURE 2.5.2-357

Rev 5



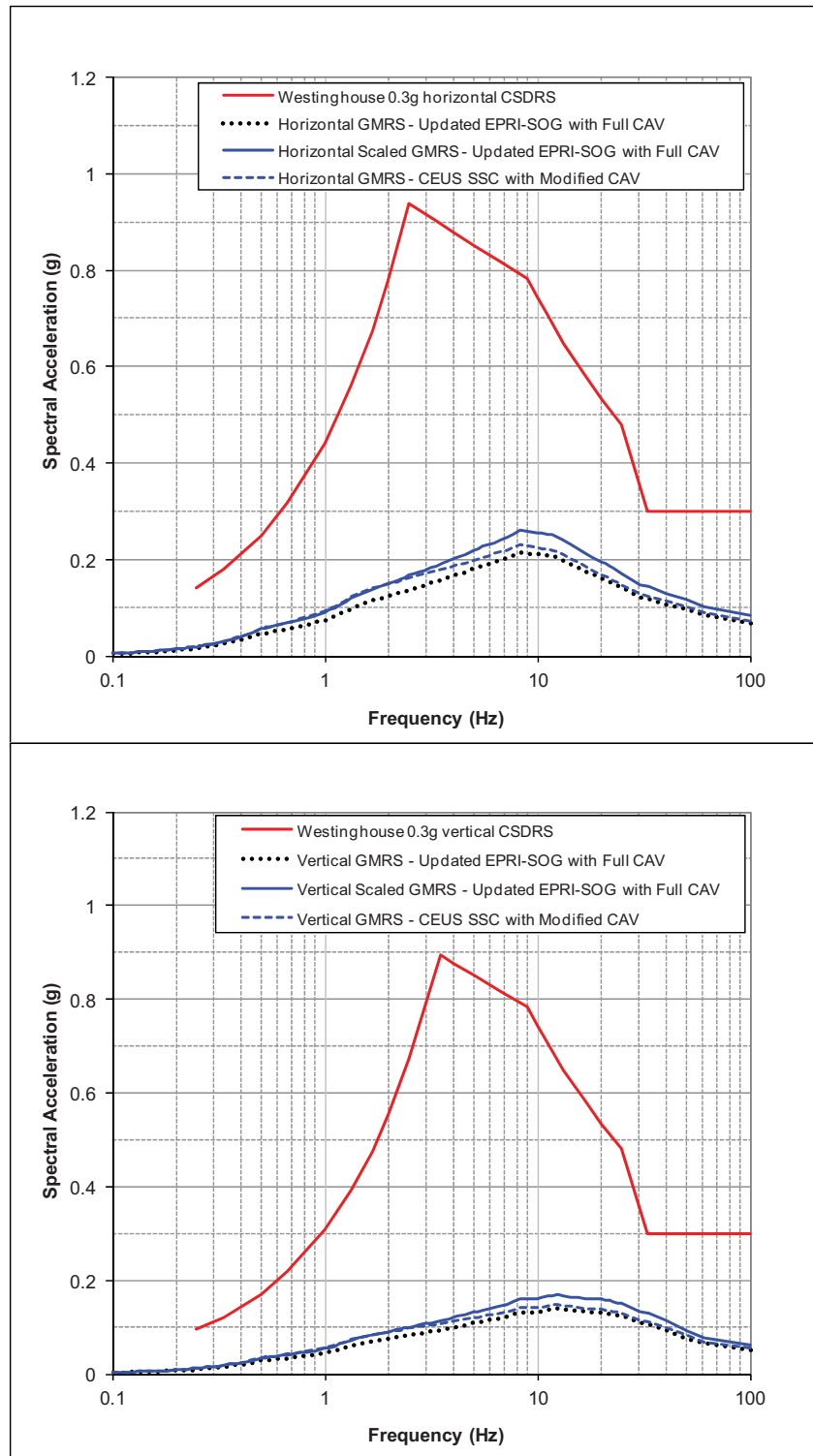
Note: 5 percent damping

Progress Energy Florida

**Levy Nuclear Plant
Units 1 and 2
Part 2, Final Safety Analysis Report**

Comparison of Reactor Building FIRS
Based on the Updated EPRI-SOG and
CEUS SSC Models
FIGURE 2.5.2-358

Rev 5



Note: 5 percent damping

Progress Energy Florida

**Levy Nuclear Plant
Units 1 and 2
Part 2, Final Safety Analysis Report**

Comparison of GMRS Based on the
Updated EPRI-SOG and CEUS SSC
Models

FIGURE 2.5.2-355

Rev 5