

APPENDIX 3.7A

SOIL-STRUCTURE INTERACTION ANALYSIS
METHODOLOGY AND RESULTS

APPENDIX 3.7A – SOIL-STRUCTURE INTERACTION ANALYSIS
METHODOLOGY AND RESULTS

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APPENDIX 3.7A – SOIL-STRUCTURE INTERACTION ANALYSIS
METHODOLOGY AND RESULTS

3.7A.1 Overview

This appendix presents the analysis results that are used to establish the seismic design loads for nuclear island structures and the emergency diesel generator building in the APR1400 standard plant design. The soil-structure interaction (SSI) analysis and fixed-base analysis are performed using the seismic input parameters and methodology described in Section 3.7.

Three-dimensional SSI analyses are performed based on a safe shutdown earthquake (SSE) excitation of 0.3g horizontal and vertical peak ground accelerations. A set of the certified seismic design response spectra (CSDRS)-compatible time histories is used as the input excitation. The spectral characteristics of the input motions are described in Subsection 3.7.1. A set of nine soil profiles developed to represent generic site conditions are used as the soil medium in the SSI analysis. The SSI analysis results are provided in the form of in-structure response spectra corresponding to major elevations and internal resisting forces on each floor of seismic Category I structures.

A fixed-base analysis with no SSI effects is also performed using CSDRS-compatible time histories. The model for the fixed-base analysis is identical to the model for the SSI analysis except that the shear and compression wave velocities of the foundation medium are set to high values and the backfill soil elements are removed so there is no contact of side soils with the structures over the embedment depth. The prescribed seismic input motion on the surface of the finished grade is the same as for the other soil cases. Because the foundation medium is stiff, there is virtually no variation in ground motion with depth. Therefore, the seismic input motion is considered the same as the prescribed motion at the bottom of the basemat level.

This appendix also describes the SSI analyses that are performed for seismic Category I structures. The SSI analyses use the soil profiles described in Subsection 3.7.1.3 and the control motions and structural models described in Subsections 3.7.1.1.2 and 3.7.2.3.3, respectively. The SSI analyses and fixed-base analysis use the ACS SASSI computer program. The final analysis results are obtained by enveloping the SSI analysis results and the fixed-base analysis results.

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3.7A.2 Site Response Analysis

3.7A.2.1 Soil Column Model

The soil column models that are used in the site response analysis for the APR1400 are developed as shown in Tables 3.7A-1 through 3.7A-9.

The variation of shear modulus with shear strain and the variation of damping in the soil with shear strain are shown in Figures 3.7A-1 and 3.7A-2, respectively. The variations are based on the curves that are recommended in EPRI TR-102293.

3.7A.2.2 Strain-compatible Soil Properties

The horizontal and vertical site response analyses are performed separately for the above nine low-strain soil properties. The seismic input motions for the horizontal site response analysis are the horizontal components of an SSE. The seismic input motion for the vertical site response analysis is the vertical component of an SSE. The seismic input motions used in the analyses are defined as outcrop motions at the site grade elevation, El. 98 ft 8 in, where the shear wave velocity is greater than 304.8 m/sec (1,000 ft/sec).

In the horizontal site response analyses, the strain-compatible soil/rock properties resulting from the east-west (E-W) and north-south (N-S) components of the seismic input motions differ slightly from each other because of the different time history input motions. To obtain a common set of strain-compatible soil properties for the SSI analysis, the strain-compatible soil properties resulting from the E-W and N-S input motions for each case are averaged. The average sets of strain-compatible properties for the nine soil profiles are shown in Tables 3.7A-1 through 3.7A-9. The strain-compatible soil properties are the equivalent-linear properties used in the SSI analysis of seismic Category I structures.

Strain-compatible soil damping values greater than 15 percent are not used in accordance with NRC SRP 3.7.2.

3.7A.2.3 Strain-compatible Free-field Seismic Response Motions

Free-field response motions at the foundation base elevation that are consistent with the strain-compatible equivalent-linear soil properties are also obtained from the site response analyses. The soil models using the average strain-compatible soil/rock properties as

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shown in Tables 3.7A-1 through 3.7A-9 are then subjected to the control motion input defined as outcrop motion at the site grade elevation.

Figures 3.7A-12 through 3.7A-14 show the comparison of 5 percent damped response spectra between the seismic input motion enveloped for all site soil column models at the free-field site grade elevation and the seismic response outcrop motions enveloped for all site soil column models at the nuclear island foundation base elevation. The peak ground accelerations of the horizontal site response motions at the nuclear island foundation base elevation are greater than 0.1g.

3.7A.3 SSI Analysis

Because the analyses are performed in the frequency domain, the transfer functions are generated up to a maximum cutoff frequency. Cutoff frequencies are the maximum frequencies that the soil media can transmit without loss of accuracy in the solution. In the present analyses, cutoff frequencies are computed based on the dimensions of the soil discretization. The maximum frequency that a soil layer can transmit corresponds to a wavelength equal to $5h$, where h is the layer thickness. Cutoff frequencies vary according to the soil profiles used in the analyses. Table 3.7A-10 lists the cutoff frequencies for nine soil profiles.

3.7A.3.1 SSI Analysis Cases

A summary of the SSI analysis cases is presented in Table 3.7A-10. Nine SSI analyses are performed using all generic soil profiles described in Subsection 3.7.1.3.

All analyses are three-dimensional with input excitation provided in three directions. The generic soil sites differ from each other with respect to soil properties and depth of soil over bedrock. The embedment depth of the nuclear island is approximately 16.4 m (53 ft 8 in) in all cases.

The soil layers used in the SSI models and their associated strain-compatible soil/rock properties are shown in Tables 3.7A-1 to 3.7A-9 for all soil cases.

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3.7A.3.2 Generation of Acceleration Time Histories

Acceleration time histories at key locations for the horizontal and vertical analyses due to the three control motions are computed. The locations selected are summarized in Section 3.7.A.3.4. Time histories are computed for X, Y, and Z translations as follows:

- a. The module MOTION is first used to generate transfer functions in the frequency domain at key locations. MOTION uses the uninterpolated transfer functions at the computed frequencies from ANALYS and performs the interpolation for intermediate frequencies. The transfer functions are computed up to the cutoff frequency. The interpolated transfer functions are reviewed to provide reasonable assurance that spurious spikes are not caused by the interpolation. At this step, the control motions are not yet applied.
- b. When the transfer functions are finalized, MOTION is again executed for the same set of frequencies as in step (a) but this time multiplying the control motions with the transfer functions in the frequency domain and then obtaining acceleration time histories in the time domain through an inverse Fourier transform technique. In this step, MOTION convolutes the control motions and outputs results in the time domain. Three sets of MOTION runs are made for X, Y, and Z directions, using the appropriate transfer function file in each direction with output at identical locations. This step is repeated three times for control motions in X, Y, and Z directions. All control motions are for a duration of 20.48 seconds at a time step of 0.005 second.

3.7A.3.3 Generation of In-structure Response Spectra

The generation of in-structure response spectra (ISRS) first involves the computation of acceleration time histories at selected in-structure locations $X(i)$, $Y(i)$, and $Z(i)$, $i = x, y, z$, as described in the previous step.

The time histories $X(i)$, $Y(i)$, and $Z(i)$, $i = x, y, z$ at each location are then used as input for the computation of ISRS for 2, 3, 4, 5, 7, and 10 percent damping. The response spectra are computed at numerous frequencies. These frequencies cover the frequency range of interest and exceed the guidelines of SRP 3.7.1. The total ISRS at each location is then computed using the square-root-of-the-sum-of-the-squares (SRSS) method. The ISRS are then widened by ± 15 percent in accordance with NRC RG 1.122.

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3.7A.3.4 Output Locations

Table 3.7A-11 shows the key locations where the ISRS are obtained. The key locations are locations that are expected to represent the minimum and maximum seismic responses in the structure and include the basemat and roof slab elevations and the support elevations of the major equipment.

3.7A.4 Analysis Results

Representative plots of the envelope SSE response spectra are presented in Figures 3.7A-15 to 3.7A-93. The corresponding locations are at the foundation basemat (El. 55 ft 0 in), auxiliary building (El. 100 ft 0 in, 156 ft 0 in), top of the auxiliary building (El. 213 ft 0 in, 216 ft 9 in), reactor containment building containment structure (El. 104 ft 0 in, 160 ft 0 in), top of the reactor containment building containment structure dome (El. 332 ft 0 in), reactor containment building internal structure (El. 78 ft 0 in, 156 ft 0 in), and top of reactor containment building internal structures (El. 191 ft 0 in), as described in Table 3.7A-11. Damping ratios are 2, 3, 4, 5, 7, and 10 percent of critical. Responses from all soil cases are superimposed on the same plot for each location and each direction (X, Y, Z). The fixed-base spectra are also superimposed on these plots for completeness of the envelope.

The range of site parameters used in the SSI analyses covers a broad range of site conditions. Soil amplification occurs at frequencies in the range of the dominant structural modal frequencies. Therefore, resonance effects between the soil and the structures are captured in the SSI analyses and are reflected in the results. As such, the combined SSI results provide reasonable assurance that adequate seismic loads for APR1400 seismic Category I structures have been generated for sites that are compatible with the generic sites used in these analyses.

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Table 3.7A-1 (1 of 4)

Soil Layers and Properties (Case 1)

Soil Type	Layer No.	Thick. (ft)	$\gamma^{(1)}$ (k/ft ³)	Low Strain			Strain-Compatible			
				Vs (ft/s)	Vp ⁽²⁾ (ft/s)	$\rho^{(3)}$	Damp.	Avg. Vs (ft/s)	Vp (ft/s)	ρ
Sand	1	5	0.125	1,173	2,873	0.40	0.020	1,155	4,800	0.47
	2	5	0.125	1,196	2,929	0.40	0.031	1,132	4,800	0.47
	3	5	0.125	1,219	2,985	0.40	0.041	1,102	4,800	0.47
	4	5	0.125	1,241	3,040	0.40	0.048	1,087	4,800	0.47
	5	5	0.125	1,264	3,095	0.40	0.037	1,142	4,800	0.47
	6	5	0.125	1,286	3,150	0.40	0.042	1,138	4,800	0.47
	7	5	0.125	1,308	3,204	0.40	0.046	1,138	4,800	0.47
	8	5	0.125	1,330	3,259	0.40	0.050	1,141	4,800	0.47
	9	5	0.125	1,352	3,313	0.40	0.053	1,144	4,800	0.47
	10	5	0.125	1,374	3,366	0.40	0.056	1,149	4,800	0.47
	11	5	0.125	1,396	3,420	0.40	0.043	1,224	4,800	0.47
	12	5	0.125	1,418	3,473	0.40	0.044	1,234	4,800	0.46
	13	5	0.125	1,439	3,526	0.40	0.046	1,246	4,800	0.46
	14	5	0.125	1,461	3,578	0.40	0.047	1,257	4,800	0.46
	15	5	0.125	1,482	3,630	0.40	0.047	1,271	4,800	0.46
	16	5	0.125	1,503	3,682	0.40	0.048	1,285	4,800	0.46
	17	5	0.125	1,524	3,734	0.40	0.048	1,299	4,800	0.46
	18	5	0.125	1,545	3,785	0.40	0.049	1,314	4,800	0.46
	19	5	0.125	1,566	3,837	0.40	0.050	1,328	4,800	0.46
	20	5	0.125	1,587	3,887	0.40	0.050	1,342	4,800	0.46
	21	5	0.125	1,608	3,938	0.40	0.050	1,357	4,800	0.46
	22	5	0.125	1,628	3,988	0.40	0.051	1,373	4,800	0.46
	23	5	0.125	1,649	4,038	0.40	0.051	1,389	4,800	0.45
	24	5	0.125	1,669	4,088	0.40	0.051	1,406	4,800	0.45
	25	5	0.125	1,689	4,137	0.40	0.039	1,489	4,800	0.45
	26	5	0.125	1,709	4,187	0.40	0.039	1,506	4,800	0.45

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Table 3.7A-1 (2 of 4)

Soil Type	Layer No.	Thick. (ft)	$\gamma^{(1)}$ (k/ft ³)	Low Strain			Strain-Compatible			
				Vs (ft/s)	Vp ⁽²⁾ (ft/s)	$\rho^{(3)}$	Damp.	Avg. Vs (ft/s)	Vp (ft/s)	ρ
Sand (cont.)	27	5	0.125	1,729	4,235	0.40	0.039	1,523	4,800	0.44
	28	5	0.125	1,749	4,284	0.40	0.039	1,540	4,800	0.44
	29	5	0.125	1,769	4,332	0.40	0.039	1,556	4,800	0.44
	30	5	0.125	1,788	4,380	0.40	0.039	1,573	4,800	0.44
	31	5	0.125	1,808	4,428	0.40	0.039	1,590	4,800	0.44
	32	5	0.125	1,827	4,476	0.40	0.039	1,608	4,800	0.44
	33	5	0.125	1,846	4,523	0.40	0.039	1,625	4,800	0.44
	34	5	0.125	1,866	4,570	0.40	0.039	1,642	4,800	0.43
	35	5	0.125	1,885	4,616	0.40	0.039	1,659	4,800	0.43
	36	5	0.125	1,904	4,663	0.40	0.039	1,676	4,800	0.43
	37	5	0.125	1,922	4,709	0.40	0.039	1,692	4,800	0.43
	38	5	0.125	1,941	4,754	0.40	0.039	1,709	4,800	0.43
	39	5	0.125	1,960	4,800	0.40	0.039	1,725	4,800	0.43
	40	5	0.125	1,978	4,845	0.40	0.039	1,742	4,845	0.43
	41	10	0.13	2,926	6,650	0.38	0.022	2,780	6,650	0.39
	42	10	0.13	2,962	6,732	0.38	0.022	2,814	6,732	0.39
	43	10	0.13	2,998	6,813	0.38	0.022	2,845	6,813	0.39
	44	10	0.13	3,033	6,894	0.38	0.023	2,876	6,894	0.39
	45	10	0.13	3,068	6,973	0.38	0.023	2,907	6,973	0.39
	46	10	0.13	3,102	7,051	0.38	0.018	2,992	7,051	0.39
	47	10	0.13	3,136	7,128	0.38	0.019	3,022	7,128	0.39
	48	10	0.13	3,169	7,204	0.38	0.019	3,053	7,204	0.39
	49	10	0.13	3,202	7,279	0.38	0.019	3,083	7,279	0.39
	50	10	0.13	3,235	7,353	0.38	0.019	3,113	7,353	0.39
	51	10	0.13	3,267	7,426	0.38	0.019	3,142	7,426	0.39
	52	10	0.13	3,299	7,498	0.38	0.019	3,172	7,498	0.39

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Table 3.7A-1 (3 of 4)

Soil Type	Layer No.	Thick. (ft)	$\gamma^{(1)}$ (k/ft ³)	Low Strain			Strain-Compatible			
				Vs (ft/s)	Vp ⁽²⁾ (ft/s)	$\rho^{(3)}$	Damp.	Avg. Vs (ft/s)	Vp (ft/s)	ρ
Sand (cont.)	53	10	0.130	3,330	7,569	0.38	0.019	3,200	7,569	0.39
	54	10	0.130	3,361	7,639	0.38	0.019	3,229	7,639	0.39
	55	10	0.130	3,391	7,707	0.38	0.019	3,258	7,707	0.39
	56	10	0.130	3,421	7,775	0.38	0.019	3,286	7,775	0.39
	57	10	0.130	3,450	7,842	0.38	0.019	3,314	7,842	0.39
	58	10	0.130	3,479	7,907	0.38	0.019	3,342	7,907	0.39
	59	10	0.130	3,507	7,972	0.38	0.019	3,369	7,972	0.39
	60	10	0.130	3,535	8,035	0.38	0.019	3,396	8,035	0.39
	61	10	0.130	3,563	8,098	0.38	0.019	3,423	8,098	0.39
	62	10	0.130	3,590	8,159	0.38	0.019	3,449	8,159	0.39
	63	10	0.130	3,616	8,220	0.38	0.019	3,475	8,220	0.39
	64	10	0.130	3,642	8,279	0.38	0.019	3,501	8,279	0.39
	65	10	0.130	3,668	8,337	0.38	0.019	3,526	8,337	0.39
	66	10	0.130	3,693	8,395	0.38	0.019	3,550	8,395	0.39
	67	10	0.130	3,718	8,451	0.38	0.019	3,574	8,451	0.39
	68	10	0.130	3,742	8,506	0.38	0.019	3,598	8,506	0.39
	69	10	0.130	3,766	8,560	0.38	0.019	3,621	8,560	0.39
	70	10	0.130	3,789	8,613	0.38	0.019	3,644	8,613	0.39
Soft Rock	71	20	0.135	5,778	12,029	0.35	0.035	5,748	12,029	0.35
	72	20	0.135	5,822	12,120	0.35	0.035	5,792	12,120	0.35
	73	20	0.135	5,864	12,208	0.35	0.035	5,833	12,208	0.35
	74	20	0.135	5,905	12,292	0.35	0.035	5,872	12,292	0.35
	75	20	0.135	5,943	12,372	0.35	0.035	5,909	12,372	0.35
	76	20	0.135	5,980	12,448	0.35	0.035	5,944	12,448	0.35
	77	20	0.135	6,014	12,520	0.35	0.035	5,978	12,520	0.35
	78	20	0.135	6,047	12,588	0.35	0.035	6,009	12,588	0.35

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Table 3.7A-1 (4 of 4)

Soil Type	Layer No.	Thick. (ft)	$\gamma^{(1)}$ (k/ft ³)	Low Strain			Strain-Compatible			
				Vs (ft/s)	Vp ⁽²⁾ (ft/s)	$\rho^{(3)}$	Damp.	Avg. Vs (ft/s)	Vp (ft/s)	ρ
Soft Rock (cont.)	79	20	0.135	6,078	12,653	0.35	0.035	6,038	12,653	0.35
	80	20	0.135	6,108	12,714	0.35	0.035	6,066	12,714	0.35
	81	20	0.135	6,135	12,771	0.35	0.035	6,092	12,771	0.35
	82	20	0.135	6,160	12,824	0.35	0.035	6,115	12,824	0.35
	83	20	0.135	6,184	12,873	0.35	0.035	6,136	12,873	0.35
	84	20	0.135	6,206	12,919	0.35	0.036	6,157	12,919	0.35
	85	20	0.135	6,226	12,960	0.35	0.036	6,175	12,960	0.35
	86	20	0.135	6,244	12,998	0.35	0.036	6,191	12,998	0.35
	87	20	0.135	6,261	13,032	0.35	0.036	6,206	13,032	0.35
	88	20	0.135	6,275	13,062	0.35	0.036	6,218	13,062	0.35
	89	20	0.135	6,288	13,089	0.35	0.036	6,229	13,089	0.35
	90	20	0.135	6,298	13,111	0.35	0.036	6,238	13,111	0.35
	91	20	0.135	6,307	13,130	0.35	0.036	6,245	13,130	0.35
	92	20	0.135	6,315	13,145	0.35	0.036	6,251	13,145	0.35
	93	20	0.135	6,320	13,156	0.35	0.036	6,254	13,156	0.35
	94	20	0.135	6,323	13,163	0.35	0.036	6,256	13,163	0.35
	95	20	0.135	6,325	13,166	0.35	0.037	6,255	13,166	0.35
Rock	96	—	0.155	9,200	18,264	0.33	0.004	9,200	18,264	0.33

(1) Unit weight density of soil/rock

(2) The values of compression wave velocity, Vp, are for unsaturated soil. If the soil is saturated, a minimum compression wave velocity of 1,463 m/sec (4,800 ft/sec) (speed of sound in water) is used.

(3) Poisson's Ratio

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Table 3.7A-2 (1 of 4)

Soil Layers and Properties (Case 2)

Soil Type	Layer No.	Thick. (ft)	$\gamma^{(1)}$ (k/ft ³)	Low Strain			Strain-Compatible			
				Vs (ft/s)	Vp ⁽²⁾ (ft/s)	$\rho^{(3)}$	Damp.	Avg. Vs (ft/s)	Vp (ft/s)	ρ
Sand	1	5	0.125	1,020	2,498	0.40	0.022	996	4,800	0.48
	2	5	0.125	1,040	2,547	0.40	0.037	958	4,800	0.48
	3	5	0.125	1,060	2,595	0.40	0.048	930	4,800	0.48
	4	5	0.125	1,079	2,644	0.40	0.059	902	4,800	0.48
	5	5	0.125	1,099	2,691	0.40	0.047	954	4,800	0.48
	6	5	0.125	1,118	2,739	0.40	0.052	950	4,800	0.48
	7	5	0.125	1,138	2,786	0.40	0.056	948	4,800	0.48
	8	5	0.125	1,157	2,834	0.40	0.061	947	4,800	0.48
	9	5	0.125	1,176	2,881	0.40	0.064	948	4,800	0.48
	10	5	0.125	1,195	2,927	0.40	0.067	950	4,800	0.48
	11	5	0.125	1,214	2,974	0.40	0.051	1,025	4,800	0.48
	12	5	0.125	1,233	3,020	0.40	0.052	1,034	4,800	0.48
	13	5	0.125	1,252	3,066	0.40	0.053	1,044	4,800	0.48
	14	5	0.125	1,270	3,111	0.40	0.054	1,054	4,800	0.47
	15	5	0.125	1,289	3,157	0.40	0.055	1,065	4,800	0.47
	16	5	0.125	1,307	3,202	0.40	0.056	1,075	4,800	0.47
	17	5	0.125	1,326	3,247	0.40	0.057	1,086	4,800	0.47
	18	5	0.125	1,344	3,292	0.40	0.057	1,098	4,800	0.47
	19	5	0.125	1,362	3,336	0.40	0.058	1,110	4,800	0.47
	20	5	0.125	1,380	3,380	0.40	0.059	1,123	4,800	0.47
	21	5	0.130	2,198	4,996	0.38	0.029	2,044	4,996	0.40
	22	5	0.130	2,216	5,037	0.38	0.03	2,055	5,037	0.40
	23	5	0.130	2,234	5,077	0.38	0.031	2,065	5,077	0.40
	24	5	0.130	2,251	5,117	0.38	0.031	2,074	5,117	0.40
	25	5	0.130	2,269	5,157	0.38	0.024	2,134	5,157	0.40

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Table 3.7A-2 (2 of 4)

Soil Type	Layer No.	Thick. (ft)	$\gamma^{(1)}$ (k/ft ³)	Low Strain			Strain-Compatible			
				Vs (ft/s)	Vp ⁽²⁾ (ft/s)	$\rho^{(3)}$	Damp.	Avg. Vs (ft/s)	Vp (ft/s)	ρ
Sand (cont.)	26	5	0.130	2,286	5,197	0.38	0.025	2,147	5,197	0.40
	27	5	0.130	2,304	5,236	0.38	0.025	2,160	5,236	0.40
	28	5	0.130	2,321	5,275	0.38	0.025	2,174	5,275	0.40
	29	5	0.130	2,338	5,314	0.38	0.026	2,188	5,314	0.40
	30	5	0.130	2,355	5,353	0.38	0.026	2,202	5,353	0.40
	31	5	0.130	2,372	5,392	0.38	0.026	2,216	5,392	0.40
	32	5	0.130	2,389	5,430	0.38	0.026	2,229	5,430	0.40
	33	5	0.130	2,406	5,468	0.38	0.027	2,242	5,468	0.40
	34	5	0.130	2,422	5,506	0.38	0.027	2,255	5,506	0.40
	35	5	0.130	2,439	5,543	0.38	0.027	2,267	5,543	0.40
	36	5	0.130	2,455	5,581	0.38	0.027	2,280	5,581	0.40
	37	5	0.130	2,472	5,618	0.38	0.027	2,293	5,618	0.40
	38	5	0.130	2,488	5,655	0.38	0.028	2,306	5,655	0.40
	39	5	0.130	2,504	5,692	0.38	0.028	2,319	5,692	0.40
	40	5	0.130	2,520	5,728	0.38	0.028	2,332	5,728	0.40
Soft Rock	41	10	0.135	4,244	8,834	0.35	0.035	4,219	8,834	0.35
	42	10	0.135	4,275	8,900	0.35	0.035	4,248	8,900	0.35
	43	10	0.135	4,307	8,965	0.35	0.035	4,277	8,965	0.35
	44	10	0.135	4,337	9,029	0.35	0.035	4,305	9,029	0.35
	45	10	0.135	4,368	9,092	0.35	0.036	4,333	9,092	0.35
	46	10	0.135	4,397	9,154	0.35	0.036	4,361	9,154	0.35
	47	10	0.135	4,427	9,215	0.35	0.036	4,387	9,215	0.35
	48	10	0.135	4,456	9,276	0.35	0.036	4,413	9,276	0.35
	49	10	0.135	4,485	9,336	0.35	0.036	4,440	9,336	0.35
	50	10	0.135	4,513	9,395	0.35	0.036	4,466	9,395	0.35
	51	10	0.135	4,541	9,453	0.35	0.036	4,492	9,453	0.35

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Table 3.7A-2 (3 of 4)

Soil Type	Layer No.	Thick. (ft)	$\gamma^{(1)}$ (k/ft ³)	Low Strain			Strain-Compatible			
				Vs (ft/s)	Vp ⁽²⁾ (ft/s)	$\rho^{(3)}$	Damp.	Avg. Vs (ft/s)	Vp (ft/s)	ρ
Soft Rock (cont.)	52	10	0.135	4,568	9,510	0.35	0.037	4,517	9,510	0.35
	53	10	0.135	4,596	9,566	0.35	0.037	4,542	9,566	0.35
	54	10	0.135	4,622	9,622	0.35	0.037	4,567	9,622	0.35
	55	10	0.135	4,649	9,677	0.35	0.037	4,592	9,677	0.35
	56	10	0.135	4,674	9,731	0.35	0.037	4,616	9,731	0.35
	57	10	0.135	4,700	9,784	0.35	0.037	4,639	9,784	0.35
	58	10	0.135	4,725	9,836	0.35	0.037	4,663	9,836	0.36
	59	10	0.135	4,750	9,887	0.35	0.037	4,686	9,887	0.36
	60	10	0.135	4,774	9,938	0.35	0.037	4,709	9,938	0.36
	61	10	0.135	4,798	9,988	0.35	0.037	4,732	9,988	0.36
	62	10	0.135	4,821	10,037	0.35	0.038	4,754	10,037	0.36
	63	10	0.135	4,845	10,085	0.35	0.038	4,776	10,085	0.36
	64	10	0.135	4,867	10,132	0.35	0.038	4,797	10,132	0.36
	65	10	0.135	4,890	10,178	0.35	0.038	4,819	10,178	0.36
	66	10	0.135	4,911	10,224	0.35	0.038	4,839	10,224	0.36
	67	10	0.135	4,933	10,269	0.35	0.038	4,859	10,269	0.36
	68	10	0.135	4,954	10,313	0.35	0.038	4,879	10,313	0.36
	69	10	0.135	4,975	10,356	0.35	0.038	4,898	10,356	0.36
	70	10	0.135	4,995	10,398	0.35	0.038	4,918	10,398	0.36
Rock	71	20	0.145	7,025	13,946	0.33	0.012	6,847	13,946	0.34
	72	20	0.145	7,063	14,022	0.33	0.012	6,881	14,022	0.34
	73	20	0.145	7,100	14,094	0.33	0.012	6,914	14,094	0.34
	74	20	0.145	7,135	14,164	0.33	0.012	6,945	14,164	0.34
	75	20	0.145	7,168	14,230	0.33	0.012	6,976	14,230	0.34
	76	20	0.145	7,200	14,293	0.33	0.012	7,004	14,293	0.34
	77	20	0.145	7,230	14,353	0.33	0.012	7,032	14,353	0.34

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Table 3.7A-2 (4 of 4)

Soil Type	Layer No.	Thick. (ft)	$\gamma^{(1)}$ (k/ft ³)	Low Strain			Strain-Compatible			
				Vs (ft/s)	Vp ⁽²⁾ (ft/s)	$\rho^{(3)}$	Damp.	Avg. Vs (ft/s)	Vp (ft/s)	ρ
Rock (cont.)	78	20	0.145	7,259	14,410	0.33	0.012	7,057	14,410	0.34
	79	20	0.145	7,286	14,463	0.33	0.012	7,081	14,463	0.34
	80	20	0.145	7,311	14,514	0.33	0.012	7,103	14,514	0.34
	81	20	0.145	7,335	14,561	0.33	0.012	7,124	14,561	0.34
	82	20	0.145	7,357	14,605	0.33	0.012	7,143	14,605	0.34
	83	20	0.145	7,378	14,646	0.33	0.012	7,162	14,646	0.34
	84	20	0.145	7,397	14,684	0.33	0.012	7,178	14,684	0.34
	85	20	0.145	7,414	14,718	0.33	0.012	7,191	14,718	0.34
	86	20	0.145	7,430	14,750	0.33	0.012	7,203	14,750	0.34
	87	20	0.145	7,444	14,778	0.33	0.013	7,214	14,778	0.34
	88	20	0.145	7,457	14,803	0.33	0.013	7,223	14,803	0.34
	89	20	0.145	7,468	14,825	0.33	0.013	7,232	14,825	0.34
	90	20	0.145	7,477	14,843	0.33	0.013	7,238	14,843	0.34
	91	20	0.145	7,485	14,859	0.33	0.013	7,244	14,859	0.34
	92	20	0.145	7,491	14,871	0.33	0.013	7,247	14,871	0.34
	93	20	0.145	7,496	14,880	0.33	0.013	7,250	14,880	0.34
	94	20	0.145	7,499	14,886	0.33	0.013	7,250	14,886	0.34
	95	20	0.145	7,500	14,889	0.33	0.013	7,249	14,889	0.34
	96	—	0.155	9,200	18,264	0.33	0.004	9,200	18,264	0.33

- (1) Unit weight density of soil/rock
- (2) The values of compression wave velocity, Vp, are for unsaturated soil. If the soil is saturated, a minimum compression wave velocity of 1,463 m/sec (4,800 ft/sec) (speed of sound in water) is used.
- (3) Poisson's Ratio

APR1400 DCD TIER 2

Table 3.7A-3 (1 of 4)

Soil Layers and Properties (Case 3)

Soil Type	Layer No.	Thick. (ft)	$\gamma^{(1)}$ (k/ft ³)	Low Strain			Strain-Compatible			
				Vs (ft/s)	Vp ⁽²⁾ (ft/s)	$\rho^{(3)}$	Damp.	Avg. Vs (ft/s)	Vp (ft/s)	ρ
Sand	1	5	0.130	2,090	4,800	0.38	0.015	2,090	4,800	0.38
	2	5	0.130	2,090	4,809	0.38	0.019	2,090	4,809	0.38
	3	5	0.130	2,081	4,861	0.38	0.023	2,081	4,861	0.39
	4	5	0.130	2,082	4,912	0.38	0.026	2,082	4,912	0.39
	5	5	0.130	2,126	4,963	0.38	0.021	2,126	4,963	0.39
	6	5	0.130	2,129	5,014	0.38	0.023	2,129	5,014	0.39
	7	5	0.130	2,130	5,065	0.38	0.025	2,130	5,065	0.39
	8	5	0.130	2,134	5,115	0.38	0.027	2,134	5,115	0.39
	9	5	0.130	2,140	5,165	0.38	0.028	2,140	5,165	0.40
	10	5	0.130	2,148	5,215	0.38	0.030	2,148	5,215	0.40
	11	5	0.130	2,213	5,264	0.38	0.024	2,213	5,264	0.39
	12	5	0.130	2,226	5,314	0.38	0.024	2,226	5,314	0.39
	13	5	0.130	2,241	5,363	0.38	0.025	2,241	5,363	0.39
	14	5	0.130	2,255	5,412	0.38	0.025	2,255	5,412	0.39
	15	5	0.130	2,270	5,460	0.38	0.026	2,270	5,460	0.40
	16	5	0.130	2,285	5,508	0.38	0.026	2,285	5,508	0.40
	17	5	0.130	2,300	5,556	0.38	0.026	2,300	5,556	0.40
	18	5	0.130	2,315	5,604	0.38	0.027	2,315	5,604	0.40
	19	5	0.130	2,331	5,651	0.38	0.027	2,331	5,651	0.40
	20	5	0.130	2,345	5,699	0.38	0.028	2,345	5,699	0.40
	21	5	0.130	2,358	5,745	0.38	0.029	2,358	5,745	0.40
	22	5	0.130	2,372	5,792	0.38	0.029	2,372	5,792	0.40
	23	5	0.130	2,386	5,839	0.38	0.029	2,386	5,839	0.40
	24	5	0.130	2,400	5,885	0.38	0.030	2,400	5,885	0.40
	25	5	0.130	2,466	5,931	0.38	0.023	2,466	5,931	0.40
	26	5	0.130	2,482	5,976	0.38	0.024	2,482	5,976	0.40

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Table 3.7A-3 (2 of 4)

Soil Type	Layer No.	Thick. (ft)	$\gamma^{(1)}$ (k/ft ³)	Low Strain			Strain-Compatible			
				Vs (ft/s)	Vp ⁽²⁾ (ft/s)	$\rho^{(3)}$	Damp.	Avg. Vs (ft/s)	Vp (ft/s)	ρ
Sand (cont.)	27	5	0.130	2,498	6,021	0.38	0.024	2,498	6,021	0.40
	28	5	0.130	2,514	6,067	0.38	0.024	2,514	6,067	0.40
	29	5	0.130	2,530	6,111	0.38	0.024	2,530	6,111	0.40
	30	5	0.130	2,546	6,156	0.38	0.025	2,546	6,156	0.40
	31	5	0.130	2,562	6,200	0.38	0.025	2,562	6,200	0.40
	32	5	0.130	2,578	6,244	0.38	0.025	2,578	6,244	0.40
	33	5	0.130	2,594	6,288	0.38	0.025	2,594	6,288	0.40
	34	5	0.130	2,609	6,332	0.38	0.025	2,609	6,332	0.40
	35	5	0.130	2,624	6,375	0.38	0.026	2,624	6,375	0.40
	36	5	0.130	2,640	6,418	0.38	0.026	2,640	6,418	0.40
	37	5	0.130	2,655	6,461	0.38	0.026	2,655	6,461	0.40
	38	5	0.130	2,670	6,503	0.38	0.026	2,670	6,503	0.40
	39	5	0.130	2,685	6,545	0.38	0.026	2,685	6,545	0.40
	40	5	0.130	2,700	6,587	0.38	0.026	2,700	6,587	0.40
Soft Rock	41	10	0.135	4,860	10,160	0.38	0.034	4,860	10,160	0.35
	42	10	0.135	4,893	10,235	0.38	0.034	4,893	10,235	0.35
	43	10	0.135	4,926	10,309	0.38	0.034	4,926	10,309	0.35
	44	10	0.135	4,959	10,383	0.38	0.035	4,959	10,383	0.35
	45	10	0.135	4,991	10,455	0.38	0.035	4,991	10,455	0.35
	46	10	0.135	5,023	10,527	0.38	0.035	5,023	10,527	0.35
	47	10	0.135	5,055	10,598	0.38	0.035	5,055	10,598	0.35
	48	10	0.135	5,087	10,667	0.38	0.035	5,087	10,667	0.35
	49	10	0.135	5,117	10,736	0.38	0.035	5,117	10,736	0.35
	50	10	0.135	5,147	10,804	0.38	0.035	5,147	10,804	0.35
	51	10	0.135	5,178	10,871	0.38	0.036	5,178	10,871	0.35
	52	10	0.135	5,207	10,936	0.38	0.036	5,207	10,936	0.35

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Table 3.7A-3 (3 of 4)

Soil Type	Layer No.	Thick. (ft)	$\gamma^{(1)}$ (k/ft ³)	Low Strain			Strain-Compatible			
				Vs (ft/s)	Vp ⁽²⁾ (ft/s)	$\rho^{(3)}$	Damp.	Avg. Vs (ft/s)	Vp (ft/s)	ρ
Soft Rock (cont.)	53	10	0.135	5,322	11,190	0.38	0.036	5,237	11,001	0.35
	54	10	0.135	5,349	11,251	0.38	0.036	5,266	11,065	0.35
	55	10	0.135	5,377	11,311	0.38	0.036	5,294	11,128	0.35
	56	10	0.135	5,403	11,370	0.38	0.036	5,322	11,190	0.35
	57	10	0.135	5,430	11,429	0.38	0.036	5,349	11,251	0.35
	58	10	0.135	5,456	11,486	0.38	0.036	5,377	11,311	0.35
	59	10	0.135	5,481	11,542	0.38	0.036	5,403	11,370	0.35
	60	10	0.135	5,506	11,597	0.38	0.036	5,430	11,429	0.35
	61	10	0.135	5,530	11,652	0.38	0.036	5,456	11,486	0.35
	62	10	0.135	5,554	11,705	0.38	0.036	5,481	11,542	0.35
	63	10	0.135	5,577	11,757	0.38	0.037	5,506	11,597	0.35
	64	10	0.135	5,601	11,809	0.38	0.037	5,530	11,652	0.35
	65	10	0.135	5,624	11,859	0.38	0.037	5,554	11,705	0.35
	66	10	0.135	5,646	11,909	0.38	0.037	5,577	11,757	0.35
	67	10	0.135	5,668	11,958	0.38	0.037	5,601	11,809	0.35
	68	10	0.135	9,200	18,264	0.38	0.037	5,624	11,859	0.35
	69	10	0.135	9,200	18,264	0.38	0.037	5,646	11,909	0.36
	70	10	0.135	9,200	18,264	0.38	0.037	5,668	11,958	0.36
Rock	71	20	0.155	9,200	18,264	0.38	0.010	9,200	18,264	0.33
	72	20	0.155	9,200	18,264	0.38	0.010	9,200	18,264	0.33
	73	20	0.155	9,200	18,264	0.38	0.010	9,200	18,264	0.33
	74	20	0.155	9,200	18,264	0.38	0.010	9,200	18,264	0.33
	75	20	0.155	9,200	18,264	0.38	0.010	9,200	18,264	0.33
	76	20	0.155	9,200	18,264	0.38	0.010	9,200	18,264	0.33
	77	20	0.155	9,200	18,264	0.38	0.010	9,200	18,264	0.33
	78	20	0.155	9,200	18,264	0.38	0.010	9,200	18,264	0.33

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Table 3.7A-3 (4 of 4)

Soil Type	Layer No.	Thick. (ft)	$\gamma^{(1)}$ (k/ft ³)	Low Strain			Strain-Compatible			
				Vs (ft/s)	Vp ⁽²⁾ (ft/s)	$\rho^{(3)}$	Damp.	Avg. Vs (ft/s)	Vp (ft/s)	ρ
Rock (cont.)	79	20	0.155	9,200	18,264	0.38	0.010	9,200	18,264	0.33
	80	20	0.155	9,200	18,264	0.38	0.010	9,200	18,264	0.33
	81	20	0.155	9,200	18,264	0.35	0.010	9,200	18,264	0.33
	82	20	0.155	9,200	18,264	0.35	0.010	9,200	18,264	0.33
	83	20	0.155	9,200	18,264	0.35	0.010	9,200	18,264	0.33
	84	20	0.155	9,200	18,264	0.35	0.010	9,200	18,264	0.33
	85	20	0.155	9,200	18,264	0.35	0.010	9,200	18,264	0.33
	86	20	0.155	9,200	18,264	0.35	0.010	9,200	18,264	0.33
	87	20	0.155	9,200	18,264	0.35	0.010	9,200	18,264	0.33
	88	20	0.155	9,200	18,264	0.35	0.010	9,200	18,264	0.33
	89	20	0.155	9,200	18,264	0.35	0.010	9,200	18,264	0.33
	90	20	0.155	9,200	18,264	0.35	0.010	9,200	18,264	0.33
	91	20	0.155	9,200	18,264	0.35	0.010	9,200	18,264	0.33
	92	20	0.155	9,200	18,264	0.35	0.010	9,200	18,264	0.33
	93	20	0.155	9,200	18,264	0.35	0.010	9,200	18,264	0.33
	94	20	0.155	9,200	18,264	0.35	0.010	9,200	18,264	0.33
	95	20	0.155	9,200	18,264	0.35	0.010	9,200	18,264	0.33
	96	—	0.155	9,200	18,264	0.35	0.004	9,200	18,264	0.33

(1) Unit weight density of soil/rock

(2) The values of compression wave velocity, Vp, are for unsaturated soil. If the soil is saturated, a minimum compression wave velocity of 1,463 m/sec (4,800 ft/sec) (speed of sound in water) is used.

(3) Poisson's Ratio

APR1400 DCD TIER 2

Table 3.7A-4 (1 of 4)

Soil Layers and Properties (Case 4)

Soil Type	Layer No.	Thick. (ft)	$\gamma^{(1)}$ (k/ft ³)	Low Strain			Strain-Compatible			
				Vs (ft/s)	Vp ⁽²⁾ (ft/s)	$\rho^{(3)}$	Damp.	Avg. Vs (ft/s)	Vp (ft/s)	ρ
Sand	1	5	0.130	1,820	4,137	0.38	0.016	1,813	4,800	0.42
	2	5	0.130	1,840	4,182	0.38	0.021	1,802	4,800	0.42
	3	5	0.130	1,860	4,227	0.38	0.026	1,794	4,800	0.42
	4	5	0.130	1,879	4,272	0.38	0.029	1,790	4,800	0.42
	5	5	0.130	1,899	4,316	0.38	0.025	1,820	4,800	0.42
	6	5	0.130	1,918	4,360	0.38	0.027	1,817	4,800	0.42
	7	5	0.130	1,938	4,404	0.38	0.029	1,818	4,800	0.42
	8	5	0.130	1,957	4,448	0.38	0.031	1,820	4,800	0.42
	9	5	0.130	1,976	4,491	0.38	0.033	1,826	4,800	0.42
	10	5	0.130	1,995	4,535	0.38	0.034	1,832	4,800	0.41
	11	5	0.130	2,014	4,578	0.38	0.026	1,898	4,800	0.41
	12	5	0.130	2,033	4,621	0.38	0.027	1,909	4,800	0.41
	13	5	0.130	2,052	4,663	0.38	0.027	1,921	4,800	0.40
	14	5	0.130	2,070	4,706	0.38	0.029	1,930	4,800	0.40
	15	5	0.130	2,089	4,748	0.38	0.029	1,939	4,800	0.40
	16	5	0.130	2,107	4,790	0.38	0.030	1,949	4,800	0.40
	17	5	0.130	2,126	4,831	0.38	0.032	1,958	4,831	0.40
	18	5	0.130	2,144	4,873	0.38	0.033	1,967	4,873	0.40
	19	5	0.130	2,162	4,914	0.38	0.033	1,975	4,914	0.40
	20	5	0.130	2,180	4,955	0.38	0.034	1,984	4,955	0.40
Soft Rock	21	5	0.135	3,898	8,114	0.35	0.033	3,892	8,114	0.35
	22	5	0.135	3,916	8,151	0.35	0.034	3,908	8,151	0.35
	23	5	0.135	3,934	8,188	0.35	0.034	3,922	8,188	0.35
	24	5	0.135	3,951	8,225	0.35	0.034	3,937	8,225	0.35
	25	5	0.135	3,969	8,262	0.35	0.034	3,953	8,262	0.35
	26	5	0.135	3,986	8,298	0.35	0.035	3,968	8,298	0.35

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Table 3.7A-4 (2 of 4)

Soil Type	Layer No.	Thick. (ft)	$\gamma^{(1)}$ (k/ft ³)	Low Strain			Strain-Compatible			
				Vs (ft/s)	Vp ⁽²⁾ (ft/s)	$\rho^{(3)}$	Damp.	Avg. Vs (ft/s)	Vp (ft/s)	ρ
Soft Rock (cont.)	27	5	0.135	4,004	8,334	0.35	0.035	3,983	8,334	0.35
	28	5	0.135	4,021	8,370	0.35	0.035	3,998	8,370	0.35
	29	5	0.135	4,038	8,406	0.35	0.035	4,013	8,406	0.35
	30	5	0.135	4,055	8,441	0.35	0.035	4,027	8,441	0.35
	31	5	0.135	4,072	8,476	0.35	0.035	4,042	8,476	0.35
	32	5	0.135	4,089	8,512	0.35	0.036	4,057	8,512	0.35
	33	5	0.135	4,106	8,546	0.35	0.036	4,072	8,546	0.35
	34	5	0.135	4,122	8,581	0.35	0.036	4,087	8,581	0.35
	35	5	0.135	4,139	8,616	0.35	0.036	4,102	8,616	0.35
	36	5	0.135	4,155	8,650	0.35	0.036	4,116	8,650	0.35
	37	5	0.135	4,172	8,684	0.35	0.036	4,131	8,684	0.35
	38	5	0.135	4,188	8,718	0.35	0.036	4,145	8,718	0.35
	39	5	0.135	4,204	8,751	0.35	0.036	4,160	8,751	0.35
	40	5	0.135	4,220	8,785	0.35	0.037	4,175	8,785	0.35
Rock	41	10	0.145	6,244	12,396	0.33	0.011	6,120	12,396	0.34
	42	10	0.145	6,275	12,458	0.33	0.011	6,147	12,458	0.34
	43	10	0.145	6,307	12,520	0.33	0.011	6,173	12,520	0.34
	44	10	0.145	6,337	12,581	0.33	0.011	6,200	12,581	0.34
	45	10	0.145	6,368	12,641	0.33	0.011	6,225	12,641	0.34
	46	10	0.145	6,397	12,700	0.33	0.011	6,252	12,700	0.34
	47	10	0.145	6,427	12,759	0.33	0.011	6,278	12,759	0.34
	48	10	0.145	6,456	12,817	0.33	0.011	6,303	12,817	0.34
	49	10	0.145	6,485	12,874	0.33	0.011	6,328	12,874	0.34
	50	10	0.145	6,513	12,930	0.33	0.011	6,353	12,930	0.34
	51	10	0.145	6,541	12,985	0.33	0.012	6,378	12,985	0.34
	52	10	0.145	6,568	13,040	0.33	0.012	6,401	13,040	0.34

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Table 3.7A-4 (3 of 4)

Soil Type	Layer No.	Thick. (ft)	$\gamma^{(1)}$ (k/ft ³)	Low Strain			Strain-Compatible			
				Vs (ft/s)	Vp ⁽²⁾ (ft/s)	$\rho^{(3)}$	Damp.	Avg. Vs (ft/s)	Vp (ft/s)	ρ
Rock (cont.)	53	10	0.145	6,596	13,094	0.33	0.012	6,425	13,094	0.34
	54	10	0.145	6,622	13,147	0.33	0.012	6,449	13,147	0.34
	55	10	0.145	6,649	13,199	0.33	0.012	6,472	13,199	0.34
	56	10	0.145	6,674	13,250	0.33	0.012	6,494	13,250	0.34
	57	10	0.145	6,700	13,301	0.33	0.012	6,516	13,301	0.34
	58	10	0.145	6,725	13,351	0.33	0.012	6,538	13,351	0.34
	59	10	0.145	6,750	13,400	0.33	0.012	6,559	13,400	0.34
	60	10	0.145	6,774	13,448	0.33	0.012	6,580	13,448	0.34
	61	10	0.145	6,798	13,495	0.33	0.012	6,601	13,495	0.34
	62	10	0.145	6,821	13,542	0.33	0.012	6,621	13,542	0.34
	63	10	0.145	6,845	13,588	0.33	0.012	6,641	13,588	0.34
	64	10	0.145	6,867	13,633	0.33	0.012	6,661	13,633	0.34
	65	10	0.145	6,890	13,677	0.33	0.012	6,681	13,677	0.34
	66	10	0.145	6,911	13,721	0.33	0.012	6,700	13,721	0.34
	67	10	0.145	6,933	13,763	0.33	0.012	6,719	13,763	0.34
	68	10	0.145	6,954	13,805	0.33	0.012	6,737	13,805	0.34
	69	10	0.145	6,975	13,846	0.33	0.012	6,755	13,846	0.34
	70	10	0.145	6,995	13,887	0.33	0.012	6,773	13,887	0.34
	71	20	0.155	9,200	18,264	0.33	0.01	9,200	18,264	0.33
	72	20	0.155	9,200	18,264	0.33	0.01	9,200	18,264	0.33
	73	20	0.155	9,200	18,264	0.33	0.01	9,200	18,264	0.33
	74	20	0.155	9,200	18,264	0.33	0.01	9,200	18,264	0.33
	75	20	0.155	9,200	18,264	0.33	0.01	9,200	18,264	0.33
	76	20	0.155	9,200	18,264	0.33	0.01	9,200	18,264	0.33
	77	20	0.155	9,200	18,264	0.33	0.01	9,200	18,264	0.33
	78	20	0.155	9,200	18,264	0.33	0.01	9,200	18,264	0.33

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Table 3.7A-4 (4 of 4)

Soil Type	Layer No.	Thick. (ft)	$\gamma^{(1)}$ (k/ft ³)	Low Strain			Strain-Compatible			
				Vs (ft/s)	Vp ⁽²⁾ (ft/s)	$\rho^{(3)}$	Damp.	Avg. Vs (ft/s)	Vp (ft/s)	ρ
Rock (cont.)	79	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	80	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	81	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	82	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	83	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	84	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	85	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	86	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	87	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	88	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	89	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	90	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	91	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	92	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	93	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	94	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	95	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	96	—	0.155	9,200	18,264	0.33	0.004	9,200	18,264	0.33

(1) Unit weight density of soil/rock

(2) The values of compression wave velocity, Vp, are for unsaturated soil. If the soil is saturated, a minimum compression wave velocity of 1,463 m/sec (4,800 ft/sec) (speed of sound in water) is used.

(3) Poisson's Ratio

APR1400 DCD TIER 2

Table 3.7A-5 (1 of 4)

Soil Layers and Properties (Case 5)

Soil Type	Layer No.	Thick. (ft)	$\gamma^{(1)}$ (k/ft ³)	Low Strain			Strain-Compatible			
				Vs (ft/s)	Vp ⁽²⁾ (ft/s)	$\rho^{(3)}$	Damp.	Avg. Vs (ft/s)	Vp (ft/s)	ρ
Soft Rock	1	5	0.135	4,048	8,427	0.35	0.033	4,048	8,427	0.35
	2	5	0.135	4,071	8,474	0.35	0.033	4,071	8,474	0.35
	3	5	0.135	4,094	8,521	0.35	0.035	4,086	8,521	0.35
	4	5	0.135	4,116	8,568	0.35	0.036	4,103	8,568	0.35
	5	5	0.135	4,139	8,615	0.35	0.031	4,139	8,615	0.35
	6	5	0.135	4,161	8,662	0.35	0.031	4,161	8,662	0.35
	7	5	0.135	4,183	8,708	0.35	0.031	4,183	8,708	0.35
	8	5	0.135	4,205	8,754	0.35	0.031	4,205	8,754	0.35
	9	5	0.135	4,227	8,800	0.35	0.031	4,227	8,800	0.35
	10	5	0.135	4,249	8,846	0.35	0.032	4,249	8,846	0.35
	11	5	0.135	4,271	8,891	0.35	0.032	4,271	8,891	0.35
	12	5	0.135	4,293	8,936	0.35	0.032	4,293	8,936	0.35
	13	5	0.135	4,314	8,981	0.35	0.032	4,314	8,981	0.35
	14	5	0.135	4,336	9,026	0.35	0.032	4,336	9,026	0.35
	15	5	0.135	4,357	9,070	0.35	0.032	4,357	9,070	0.35
	16	5	0.135	4,378	9,114	0.35	0.032	4,378	9,114	0.35
	17	5	0.135	4,399	9,158	0.35	0.032	4,399	9,158	0.35
	18	5	0.135	4,420	9,202	0.35	0.032	4,420	9,202	0.35
	19	5	0.135	4,441	9,245	0.35	0.032	4,441	9,245	0.35
	20	5	0.135	4,462	9,288	0.35	0.032	4,462	9,288	0.35
Rock	21	5	0.145	6,783	13,465	0.33	0.009	6,719	13,465	0.33
	22	5	0.145	6,803	13,506	0.33	0.009	6,735	13,506	0.33
	23	5	0.145	6,824	13,546	0.33	0.009	6,751	13,546	0.33
	24	5	0.145	6,844	13,587	0.33	0.009	6,767	13,587	0.34
	25	5	0.145	6,864	13,627	0.33	0.009	6,783	13,627	0.34
	26	5	0.145	6,884	13,667	0.33	0.009	6,800	13,667	0.34

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Table 3.7A-5 (2 of 4)

Soil Type	Layer No.	Thick. (ft)	$\gamma^{(1)}$ (k/ft ³)	Low Strain			Strain-Compatible			
				Vs (ft/s)	Vp ⁽²⁾ (ft/s)	$\rho^{(3)}$	Damp.	Avg. Vs (ft/s)	Vp (ft/s)	ρ
Rock (cont.)	27	5	0.145	6,904	13,706	0.33	0.009	6,816	13,706	0.34
	28	5	0.145	6,924	13,746	0.33	0.010	6,832	13,746	0.34
	29	5	0.145	6,944	13,785	0.33	0.010	6,848	13,785	0.34
	30	5	0.145	6,963	13,824	0.33	0.010	6,864	13,824	0.34
	31	5	0.145	6,983	13,862	0.33	0.010	6,880	13,862	0.34
	32	5	0.145	7,002	13,901	0.33	0.010	6,896	13,901	0.34
	33	5	0.145	7,021	13,939	0.33	0.010	6,913	13,939	0.34
	34	5	0.145	7,041	13,977	0.33	0.010	6,929	13,977	0.34
	35	5	0.145	7,060	14,015	0.33	0.010	6,945	14,015	0.34
	36	5	0.145	7,079	14,053	0.33	0.010	6,961	14,053	0.34
	37	5	0.145	7,097	14,090	0.33	0.010	6,977	14,090	0.34
	38	5	0.145	7,116	14,127	0.33	0.010	6,993	14,127	0.34
	39	5	0.145	7,135	14,164	0.33	0.010	7,009	14,164	0.34
	40	5	0.145	7,153	14,200	0.33	0.010	7,025	14,200	0.34
	41	10	0.145	7,181	14,255	0.33	0.011	7,048	14,255	0.34
	42	10	0.145	7,217	14,327	0.33	0.011	7,080	14,327	0.34
	43	10	0.145	7,253	14,398	0.33	0.011	7,110	14,398	0.34
	44	10	0.145	7,288	14,468	0.33	0.011	7,141	14,468	0.34
	45	10	0.145	7,323	14,537	0.33	0.011	7,172	14,537	0.34
	46	10	0.145	7,357	14,605	0.33	0.011	7,202	14,605	0.34
	47	10	0.145	7,391	14,673	0.33	0.011	7,232	14,673	0.34
	48	10	0.145	7,424	14,739	0.33	0.011	7,261	14,739	0.34
	49	10	0.145	7,457	14,805	0.33	0.011	7,291	14,805	0.34
	50	10	0.145	7,490	14,869	0.33	0.011	7,319	14,869	0.34
	51	10	0.145	7,522	14,933	0.33	0.011	7,347	14,933	0.34
	52	10	0.145	7,554	14,996	0.33	0.012	7,375	14,996	0.34

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Table 3.7A-5 (3 of 4)

Soil Type	Layer No.	Thick. (ft)	$\gamma^{(1)}$ (k/ft ³)	Low Strain			Strain-Compatible			
				Vs (ft/s)	Vp ⁽²⁾ (ft/s)	$\rho^{(3)}$	Damp.	Avg. Vs (ft/s)	Vp (ft/s)	ρ
Rock (cont.)	53	10	0.145	7,585	15,058	0.33	0.012	7,402	15,058	0.34
	54	10	0.145	7,616	15,119	0.33	0.012	7,429	15,119	0.34
	55	10	0.145	7,646	15,179	0.33	0.012	7,456	15,179	0.34
	56	10	0.145	7,676	15,238	0.33	0.012	7,483	15,238	0.34
	57	10	0.145	7,705	15,296	0.33	0.012	7,508	15,296	0.34
	58	10	0.145	7,734	15,353	0.33	0.012	7,534	15,353	0.34
	59	10	0.145	7,762	15,410	0.33	0.012	7,559	15,410	0.34
	60	10	0.145	7,790	15,465	0.33	0.012	7,584	15,465	0.34
	61	10	0.145	7,818	15,520	0.33	0.012	7,608	15,520	0.34
	62	10	0.145	7,845	15,573	0.33	0.012	7,632	15,573	0.34
	63	10	0.145	7,871	15,626	0.33	0.012	7,656	15,626	0.34
	64	10	0.145	7,897	15,678	0.33	0.012	7,679	15,678	0.34
	65	10	0.145	7,923	15,729	0.33	0.012	7,702	15,729	0.34
	66	10	0.145	7,948	15,779	0.33	0.012	7,724	15,779	0.34
	67	10	0.145	7,973	15,828	0.33	0.012	7,746	15,828	0.34
	68	10	0.145	7,997	15,876	0.33	0.012	7,768	15,876	0.34
	69	10	0.145	8,021	15,923	0.33	0.012	7,789	15,923	0.34
	70	10	0.145	8,044	15,970	0.33	0.012	7,809	15,970	0.34
	71	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	72	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	73	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	74	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	75	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	76	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	77	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	78	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33

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Table 3.7A-5 (4 of 4)

Soil Type	Layer No.	Thick. (ft)	$\gamma^{(1)}$ (k/ft ³)	Low Strain			Strain-Compatible			
				Vs (ft/s)	Vp ⁽²⁾ (ft/s)	$\rho^{(3)}$	Damp.	Avg. Vs (ft/s)	Vp (ft/s)	ρ
Rock (cont.)	79	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	80	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	81	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	82	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	83	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	84	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	85	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	86	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	87	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	88	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	89	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	90	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	91	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	92	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	93	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	94	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	95	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	96	5	0.155	9,200	18,264	0.33	0.004	9,200	18,264	0.33

(1) Unit weight density of soil/rock

(2) The values of compression wave velocity, Vp, are for unsaturated soil. If the soil is saturated, a minimum compression wave velocity of 1,463 m/sec (4,800 ft/sec) (speed of sound in water) is used.

(3) Poisson's Ratio

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Table 3.7A-6 (1 of 4)

Soil Layers and Properties (Case 6)

Soil Type	Layer No.	Thick. (ft)	$\gamma^{(1)}$ (k/ft ³)	Low Strain			Strain-Compatible			
				Vs (ft/s)	Vp ⁽²⁾ (ft/s)	$\rho^{(3)}$	Damp.	Avg. Vs (ft/s)	Vp (ft/s)	ρ
Sand	1	5	0.130	2,093	4,757	0.38	0.015	2,090	4,800	0.38
	2	5	0.130	2,116	4,809	0.38	0.019	2,090	4,809	0.38
	3	5	0.130	2,139	4,861	0.38	0.023	2,081	4,861	0.39
	4	5	0.130	2,161	4,912	0.38	0.026	2,082	4,912	0.39
	5	5	0.130	2,184	4,963	0.38	0.021	2,126	4,963	0.39
	6	5	0.130	2,206	5,014	0.38	0.023	2,129	5,014	0.39
	7	5	0.130	2,228	5,065	0.38	0.025	2,130	5,065	0.39
	8	5	0.130	2,250	5,115	0.38	0.027	2,134	5,115	0.39
	9	5	0.130	2,272	5,165	0.38	0.028	2,140	5,165	0.40
	10	5	0.130	2,294	5,215	0.38	0.030	2,148	5,215	0.40
Soft Rock	11	5	0.135	4,271	8,891	0.35	0.032	4,271	8,891	0.35
	12	5	0.135	4,293	8,936	0.35	0.032	4,293	8,936	0.35
	13	5	0.135	4,314	8,981	0.35	0.032	4,314	8,981	0.35
	14	5	0.135	4,336	9,026	0.35	0.032	4,336	9,026	0.35
	15	5	0.135	4,357	9,070	0.35	0.032	4,357	9,070	0.35
	16	5	0.135	4,378	9,114	0.35	0.032	4,378	9,114	0.35
	17	5	0.135	4,399	9,158	0.35	0.032	4,399	9,158	0.35
	18	5	0.135	4,420	9,202	0.35	0.032	4,420	9,202	0.35
	19	5	0.135	4,441	9,245	0.35	0.032	4,441	9,245	0.35
	20	5	0.135	4,462	9,288	0.35	0.032	4,462	9,288	0.35
	21	5	0.135	4,483	9,331	0.35	0.032	4,483	9,331	0.35
	22	5	0.135	4,503	9,374	0.35	0.032	4,503	9,374	0.35
	23	5	0.135	4,524	9,417	0.35	0.032	4,524	9,417	0.35
	24	5	0.135	4,544	9,459	0.35	0.033	4,543	9,459	0.35
	25	5	0.135	4,564	9,501	0.35	0.033	4,561	9,501	0.35
	26	5	0.135	4,584	9,543	0.35	0.033	4,580	9,543	0.35

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Table 3.7A-6 (2 of 4)

Soil Type	Layer No.	Thick. (ft)	$\gamma^{(1)}$ (k/ft ³)	Low Strain			Strain-Compatible			
				Vs (ft/s)	Vp ⁽²⁾ (ft/s)	$\rho^{(3)}$	Damp.	Avg. Vs (ft/s)	Vp (ft/s)	ρ
Soft Rock (cont.)	27	5	0.135	4,604	9,584	0.35	0.033	4,598	9,584	0.35
	28	5	0.135	4,624	9,626	0.35	0.033	4,617	9,626	0.35
	29	5	0.135	4,644	9,667	0.35	0.034	4,634	9,667	0.35
	30	5	0.135	4,663	9,707	0.35	0.034	4,651	9,707	0.35
	31	5	0.135	4,683	9,748	0.35	0.034	4,668	9,748	0.35
	32	5	0.135	4,702	9,788	0.35	0.034	4,685	9,788	0.35
	33	5	0.135	4,721	9,828	0.35	0.034	4,702	9,828	0.35
	34	5	0.135	4,741	9,868	0.35	0.034	4,719	9,868	0.35
	35	5	0.135	4,760	9,908	0.35	0.035	4,736	9,908	0.35
	36	5	0.135	4,779	9,947	0.35	0.035	4,753	9,947	0.35
	37	5	0.135	4,797	9,986	0.35	0.035	4,770	9,986	0.35
	38	5	0.135	4,816	10,025	0.35	0.035	4,786	10,025	0.35
	39	5	0.135	4,835	10,064	0.35	0.035	4,803	10,064	0.35
	40	5	0.135	4,853	10,102	0.35	0.035	4,820	10,102	0.35
Rock	41	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	42	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	43	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	44	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	45	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	46	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	47	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	48	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	49	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	50	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	51	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	52	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33

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Table 3.7A-6 (3 of 4)

Soil Type	Layer No.	Thick. (ft)	$\gamma^{(1)}$ (k/ft ³)	Low Strain			Strain-Compatible			
				Vs (ft/s)	Vp ⁽²⁾ (ft/s)	$\rho^{(3)}$	Damp.	Avg. Vs (ft/s)	Vp (ft/s)	ρ
Rock (cont.)	53	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	54	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	55	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	56	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	57	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	58	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	59	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	60	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	61	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	62	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	63	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	64	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	65	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	66	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	67	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	68	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	69	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	70	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	71	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	72	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	73	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	74	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	75	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	76	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	77	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	78	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33

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Table 3.7A-6 (4 of 4)

Soil Type	Layer No.	Thick. (ft)	$\gamma^{(1)}$ (k/ft ³)	Low Strain			Strain-Compatible			
				Vs (ft/s)	Vp ⁽²⁾ (ft/s)	$\rho^{(3)}$	Damp.	Avg. Vs (ft/s)	Vp (ft/s)	ρ
Rock (cont.)	79	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	80	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	81	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	82	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	83	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	84	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	85	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	86	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	87	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	88	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	89	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	90	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	91	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	92	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	93	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	94	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	95	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	96	—	0.155	9,200	18,264	0.33	0.004	9,200	18,264	0.33

(1) Unit weight density of soil/rock

(2) The values of compression wave velocity, Vp, are for unsaturated soil. If the soil is saturated, a minimum compression wave velocity of 1,463 m/sec (4,800 ft/sec) (speed of sound in water) is used.

(3) Poisson's Ratio

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Table 3.7A-7 (1 of 4)

Soil Layers and Properties (Case 7)

Soil Type	Layer No.	Thick. (ft)	$\gamma^{(1)}$ (k/ft ³)	Low Strain			Strain-Compatible			
				Vs (ft/s)	Vp ⁽²⁾ (ft/s)	$\rho^{(3)}$	Damp.	Avg. Vs (ft/s)	Vp (ft/s)	ρ
Sand	1	5	0.130	1,820	4,137	0.38	0.016	1,813	4,800	0.42
	2	5	0.130	1,840	4,182	0.38	0.021	1,802	4,800	0.42
	3	5	0.130	1,860	4,227	0.38	0.026	1,794	4,800	0.42
	4	5	0.130	1,879	4,272	0.38	0.029	1,790	4,800	0.42
	5	5	0.130	1,899	4,316	0.38	0.025	1,820	4,800	0.42
	6	5	0.130	1,918	4,360	0.38	0.027	1,817	4,800	0.42
	7	5	0.130	1,938	4,404	0.38	0.029	1,818	4,800	0.42
	8	5	0.130	1,957	4,448	0.38	0.031	1,820	4,800	0.42
	9	5	0.130	1,976	4,491	0.38	0.033	1,826	4,800	0.42
	10	5	0.130	1,995	4,535	0.38	0.034	1,832	4,800	0.41
Soft Rock	11	5	0.135	3,714	7,731	0.35	0.032	3,714	7,731	0.35
	12	5	0.135	3,733	7,770	0.35	0.032	3,733	7,770	0.35
	13	5	0.135	3,752	7,810	0.35	0.032	3,752	7,810	0.35
	14	5	0.135	3,770	7,848	0.35	0.032	3,770	7,848	0.35
	15	5	0.135	3,789	7,887	0.35	0.032	3,789	7,887	0.35
	16	5	0.135	3,807	7,925	0.35	0.032	3,807	7,925	0.35
	17	5	0.135	3,826	7,964	0.35	0.033	3,825	7,964	0.35
	18	5	0.135	3,844	8,002	0.35	0.033	3,841	8,002	0.35
	19	5	0.135	3,862	8,039	0.35	0.033	3,858	8,039	0.35
	20	5	0.135	3,880	8,077	0.35	0.033	3,874	8,077	0.35
Rock	21	5	0.145	5,898	11,709	0.33	0.009	5,826	11,709	0.34
	22	5	0.145	5,916	11,744	0.33	0.010	5,839	11,744	0.34
	23	5	0.145	5,934	11,780	0.33	0.010	5,853	11,780	0.34
	24	5	0.145	5,951	11,815	0.33	0.010	5,866	11,815	0.34
	25	5	0.145	5,969	11,849	0.33	0.010	5,880	11,849	0.34
	26	5	0.145	5,986	11,884	0.33	0.010	5,894	11,884	0.34

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Table 3.7A-7 (2 of 4)

Soil Type	Layer No.	Thick. (ft)	$\gamma^{(1)}$ (k/ft ³)	Low Strain			Strain-Compatible			
				Vs (ft/s)	Vp ⁽²⁾ (ft/s)	$\rho^{(3)}$	Damp.	Avg. Vs (ft/s)	Vp (ft/s)	ρ
Rock (cont.)	27	5	0.145	6,004	11,919	0.33	0.010	5,907	11,919	0.34
	28	5	0.145	6,021	11,953	0.33	0.010	5,921	11,953	0.34
	29	5	0.145	6,038	11,987	0.33	0.010	5,935	11,987	0.34
	30	5	0.145	6,055	12,021	0.33	0.010	5,949	12,021	0.34
	31	5	0.145	6,072	12,054	0.33	0.010	5,962	12,054	0.34
	32	5	0.145	6,089	12,088	0.33	0.011	5,976	12,088	0.34
	33	5	0.145	6,106	12,121	0.33	0.011	5,990	12,121	0.34
	34	5	0.145	6,122	12,154	0.33	0.011	6,004	12,154	0.34
	35	5	0.145	6,139	12,187	0.33	0.011	6,018	12,187	0.34
	36	5	0.145	6,155	12,220	0.33	0.011	6,031	12,220	0.34
	37	5	0.145	6,172	12,252	0.33	0.011	6,045	12,252	0.34
	38	5	0.145	6,188	12,284	0.33	0.011	6,059	12,284	0.34
	39	5	0.145	6,204	12,316	0.33	0.011	6,073	12,316	0.34
	40	5	0.145	6,220	12,348	0.33	0.011	6,086	12,348	0.34
	41	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	42	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	43	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	44	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	45	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	46	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	47	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	48	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	49	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	50	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	51	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	52	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33

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Table 3.7A-7 (3 of 4)

Soil Type	Layer No.	Thick. (ft)	$\gamma^{(1)}$ (k/ft ³)	Low Strain			Strain-Compatible			
				Vs (ft/s)	Vp ⁽²⁾ (ft/s)	$\rho^{(3)}$	Damp.	Avg. Vs (ft/s)	Vp (ft/s)	ρ
Rock (cont.)	53	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	54	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	55	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	56	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	57	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	58	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	59	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	60	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	61	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	62	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	63	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	64	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	65	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	66	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	67	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	68	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	69	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	70	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	71	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	72	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	73	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	74	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	75	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	76	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	77	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	78	20	0.155	9200	18,264	0.33	0.010	9,200	18,264	0.33

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Table 3.7A-7 (4 of 4)

Soil Type	Layer No.	Thick. (ft)	$\gamma^{(1)}$ (k/ft ³)	Low Strain			Strain-Compatible			
				Vs (ft/s)	Vp ⁽²⁾ (ft/s)	$\rho^{(3)}$	Damp.	Avg. Vs (ft/s)	Vp (ft/s)	ρ
Rock (cont.)	79	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	80	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	81	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	82	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	83	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	84	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	85	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	86	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	87	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	88	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	89	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	90	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	91	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	92	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	93	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	94	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	95	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	96	—	0.155	9,200	18,264	0.33	0.004	9,200	18,264	0.33

(1) Unit weight density of soil/rock

(2) The values of compression wave velocity, Vp, are for unsaturated soil. If the soil is saturated, a minimum compression wave velocity of 1,463 m/sec (4,800 ft/sec) (speed of sound in water) is used.

(3) Poisson's Ratio

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Table 3.7A-8 (1 of 4)

Soil Layers and Properties (Case 8)

Soil Type	Layer No.	Thick. (ft)	$\gamma^{(1)}$ (k/ft ³)	Low Strain			Strain-Compatible			
				Vs (ft/s)	Vp ⁽²⁾ (ft/s)	$\rho^{(3)}$	Damp.	Avg. Vs (ft/s)	Vp (ft/s)	ρ
Rock	1	5	0.145	6,348	12,602	0.33	0.002	6,348	12,602	0.33
	2	5	0.145	6,371	12,648	0.33	0.004	6,371	12,648	0.33
	3	5	0.145	6,394	12,693	0.33	0.005	6,394	12,693	0.33
	4	5	0.145	6,416	12,738	0.33	0.006	6,416	12,738	0.33
	5	5	0.145	6,439	12,782	0.33	0.006	6,435	12,782	0.33
	6	5	0.145	6,461	12,827	0.33	0.006	6,450	12,827	0.33
	7	5	0.145	6,483	12,871	0.33	0.007	6,467	12,871	0.33
	8	5	0.145	6,505	12,915	0.33	0.007	6,485	12,915	0.33
	9	5	0.145	6,527	12,958	0.33	0.007	6,503	12,958	0.33
	10	5	0.145	6,549	13,002	0.33	0.007	6,521	13,002	0.33
	11	5	0.145	6,571	13,045	0.33	0.008	6,540	13,045	0.33
	12	5	0.145	6,593	13,088	0.33	0.008	6,559	13,088	0.33
	13	5	0.145	6,614	13,131	0.33	0.008	6,578	13,131	0.33
	14	5	0.145	6,636	13,174	0.33	0.008	6,597	13,174	0.33
	15	5	0.145	6,657	13,216	0.33	0.008	6,616	13,216	0.33
	16	5	0.145	6,678	13,258	0.33	0.008	6,631	13,258	0.33
	17	5	0.145	6,699	13,300	0.33	0.008	6,646	13,300	0.33
	18	5	0.145	6,720	13,342	0.33	0.009	6,662	13,342	0.33
	19	5	0.145	6,741	13,383	0.33	0.009	6,677	13,383	0.33
	20	5	0.145	6,762	13,424	0.33	0.009	6,692	13,424	0.33
	21	5	0.145	6,783	13,465	0.33	0.009	6,708	13,465	0.33
	22	5	0.145	6,803	13,506	0.33	0.009	6,724	13,506	0.34
	23	5	0.145	6,824	13,546	0.33	0.009	6,740	13,546	0.34
	24	5	0.145	6,844	13,587	0.33	0.009	6,756	13,587	0.34
	25	5	0.145	6,864	13,627	0.33	0.009	6,773	13,627	0.34
	26	5	0.145	6,884	13,667	0.33	0.010	6,788	13,667	0.34

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Table 3.7A-8 (2 of 4)

Soil Type	Layer No.	Thick. (ft)	$\gamma^{(1)}$ (k/ft ³)	Low Strain			Strain-Compatible			
				Vs (ft/s)	Vp ⁽²⁾ (ft/s)	$\rho^{(3)}$	Damp.	Avg. Vs (ft/s)	Vp (ft/s)	ρ
Rock (cont.)	27	5	0.145	6,904	13,706	0.33	0.010	6,805	13,706	0.34
	28	5	0.145	6,924	13,746	0.33	0.010	6,821	13,746	0.34
	29	5	0.145	6,944	13,785	0.33	0.010	6,837	13,785	0.34
	30	5	0.145	6,963	13,824	0.33	0.010	6,854	13,824	0.34
	31	5	0.145	6,983	13,862	0.33	0.010	6,869	13,862	0.34
	32	5	0.145	7,002	13,901	0.33	0.010	6,886	13,901	0.34
	33	5	0.145	7,021	13,939	0.33	0.010	6,902	13,939	0.34
	34	5	0.145	7,041	13,977	0.33	0.010	6,918	13,977	0.34
	35	5	0.145	7,060	14,015	0.33	0.010	6,935	14,015	0.34
	36	5	0.145	7,079	14,053	0.33	0.010	6,951	14,053	0.34
	37	5	0.145	7,097	14,090	0.33	0.010	6,967	14,090	0.34
	38	5	0.145	7,116	14,127	0.33	0.010	6,983	14,127	0.34
	39	5	0.145	7,135	14,164	0.33	0.011	7,000	14,164	0.34
	40	5	0.145	7,153	14,200	0.33	0.011	7,015	14,200	0.34
	41	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	42	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	43	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	44	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	45	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	46	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	47	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	48	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	49	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	50	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	51	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	52	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33

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Table 3.7A-8 (3 of 4)

Soil Type	Layer No.	Thick. (ft)	$\gamma^{(1)}$ (k/ft ³)	Low Strain			Strain-Compatible			
				Vs (ft/s)	Vp ⁽²⁾ (ft/s)	$\rho^{(3)}$	Damp.	Avg. Vs (ft/s)	Vp (ft/s)	ρ
Rock (cont.)	53	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	54	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	55	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	56	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	57	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	58	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	59	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	60	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	61	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	62	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	63	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	64	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	65	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	66	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	67	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	68	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	69	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	70	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	71	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	72	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	73	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	74	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	75	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	76	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	77	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	78	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33

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Table 3.7A-8 (4 of 4)

Soil Type	Layer No.	Thick. (ft)	$\gamma^{(1)}$ (k/ft ³)	Low Strain			Strain-Compatible			
				Vs (ft/s)	Vp ⁽²⁾ (ft/s)	$\rho^{(3)}$	Damp.	Avg. Vs (ft/s)	Vp (ft/s)	ρ
Rock (cont.)	79	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	80	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	81	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	82	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	83	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	84	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	85	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	86	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	87	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	88	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	89	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	90	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	91	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	92	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	93	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	94	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	95	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	96	20	0.155	9,200	18,264	0.33	0.004	9,200	18,264	0.33

(1) Unit weight density of soil/rock

(2) The values of compression wave velocity, Vp, are for unsaturated soil. If the soil is saturated, a minimum compression wave velocity of 1,463 m/sec (4,800 ft/sec) (speed of sound in water) is used.

(3) Poisson's Ratio

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Table 3.7A-9 (1 of 4)

Soil Layers and Properties (Case 9)

Soil Type	Layer No.	Thick. (ft)	$\gamma^{(1)}$ (k/ft ³)	Low Strain			Strain-Compatible			
				Vs (ft/s)	Vp ⁽²⁾ (ft/s)	$\rho^{(3)}$	Damp.	Avg. Vs (ft/s)	Vp (ft/s)	ρ
Rock	1	5	0.145	4,692	9,315	0.33	0.003	4,692	9,315	0.33
	2	5	0.145	4,709	9,348	0.33	0.005	4,709	9,348	0.33
	3	5	0.145	4,726	9,382	0.33	0.006	4,722	9,382	0.33
	4	5	0.145	4,742	9,415	0.33	0.007	4,730	9,415	0.33
	5	5	0.145	4,759	9,448	0.33	0.007	4,741	9,448	0.33
	6	5	0.145	4,776	9,481	0.33	0.008	4,753	9,481	0.33
	7	5	0.145	4,792	9,513	0.33	0.008	4,765	9,513	0.33
	8	5	0.145	4,808	9,546	0.33	0.008	4,778	9,546	0.33
	9	5	0.145	4,825	9,578	0.33	0.008	4,785	9,578	0.33
	10	5	0.145	4,841	9,610	0.33	0.009	4,793	9,610	0.33
	11	5	0.145	4,857	9,642	0.33	0.009	4,802	9,642	0.34
	12	5	0.145	4,873	9,674	0.33	0.009	4,811	9,674	0.34
	13	5	0.145	4,889	9,706	0.33	0.009	4,821	9,706	0.34
	14	5	0.145	4,905	9,737	0.33	0.010	4,832	9,737	0.34
	15	5	0.145	4,920	9,768	0.33	0.010	4,842	9,768	0.34
	16	5	0.145	4,936	9,799	0.33	0.010	4,853	9,799	0.34
	17	5	0.145	4,952	9,830	0.33	0.010	4,864	9,830	0.34
	18	5	0.145	4,967	9,861	0.33	0.010	4,875	9,861	0.34
	19	5	0.145	4,983	9,892	0.33	0.011	4,886	9,892	0.34
	20	5	0.145	4,998	9,922	0.33	0.011	4,897	9,922	0.34
	21	5	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	22	5	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	23	5	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	24	5	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	25	5	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	26	5	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33

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Table 3.7A-9 (2 of 4)

Soil Type	Layer No.	Thick. (ft)	$\gamma^{(1)}$ (k/ft ³)	Low Strain			Strain-Compatible			
				Vs (ft/s)	Vp ⁽²⁾ (ft/s)	$\rho^{(3)}$	Damp.	Avg. Vs (ft/s)	Vp (ft/s)	ρ
Rock (cont.)	27	5	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	28	5	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	29	5	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	30	5	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	31	5	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	32	5	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	33	5	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	34	5	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	35	5	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	36	5	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	37	5	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	38	5	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	39	5	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	40	5	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	41	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	42	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	43	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	44	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	45	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	46	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	47	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	48	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	49	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	50	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	51	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	52	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33

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Table 3.7A-9 (3 of 4)

Soil Type	Layer No.	Thick. (ft)	$\gamma^{(1)}$ (k/ft ³)	Low Strain			Strain-Compatible			
				Vs (ft/s)	Vp ⁽²⁾ (ft/s)	$\rho^{(3)}$	Damp.	Avg. Vs (ft/s)	Vp (ft/s)	ρ
Rock (cont.)	53	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	54	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	55	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	56	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	57	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	58	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	59	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	60	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	61	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	62	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	63	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	64	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	65	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	66	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	67	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	68	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	69	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	70	10	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	71	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	72	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	73	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	74	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	75	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	76	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	77	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	78	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33

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Table 3.7A-9 (4 of 4)

Soil Type	Layer No.	Thick. (ft)	$\gamma^{(1)}$ (k/ft ³)	Low Strain			Strain-Compatible			
				Vs (ft/s)	Vp ⁽²⁾ (ft/s)	$\rho^{(3)}$	Damp.	Avg. Vs (ft/s)	Vp (ft/s)	ρ
Rock (cont.)	79	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	80	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	81	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	82	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	83	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	84	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	85	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	86	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	87	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	88	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	89	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	90	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	91	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	92	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	93	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	94	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	95	20	0.155	9,200	18,264	0.33	0.010	9,200	18,264	0.33
	96	—	0.155	9,200	18,264	0.33	0.004	9,200	18,264	0.33

(1) Unit weight density of soil/rock

(2) The values of compression wave velocity, Vp, are for unsaturated soil. If the soil is saturated, a minimum compression wave velocity of 1,463 m/sec (4,800 ft/sec) (speed of sound in water) is used.

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Table 3.7A-10

SSI Analysis Cases and Cut-off Frequencies

Layer	S01	S02	S03	S04	S05	S06	S07	S08	S09	S10
Above Basemat ⁽¹⁾	22	19	40	34	77	40	34	121	90	381
Below Basemat ⁽²⁾	50	42	90	77	173	173	150	263	193	800

(1) Top of soil profile, min. with upper nuclear island basemat

(2) General profile under nuclear island basemat

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Table 3.7A-11

Output Locations

Structures	Elevation	Remarks
Reactor Containment Building Internal Structure	78'-0"	Basemat elevation
	100'-0"	Support elevation of major equipments
	156'-0"	Operation floor elevation
	191'-0"	Top of internal structure
Reactor Containment Building Containment Structure	104'-0"	Ground floor elevation
	160'-0"	Operation floor elevation
	332'-0"	Top of dome
Auxiliary Building	55'-0"	Basemat elevation
	100'-0"	Ground floor elevation
	156'-0"	Main control room floor elevation
	213'-0"	Roof of auxiliary building (1)
	216'-9"	Roof of auxiliary building (2)
Emergency Diesel Generator Building	100'-0"	Foundation basemat
	135'-0"	Roof slab elevation
Diesel Fuel Oil Storage Tank Room	63'-0"	Foundation basemat
	100'-0"	Roof slab elevation

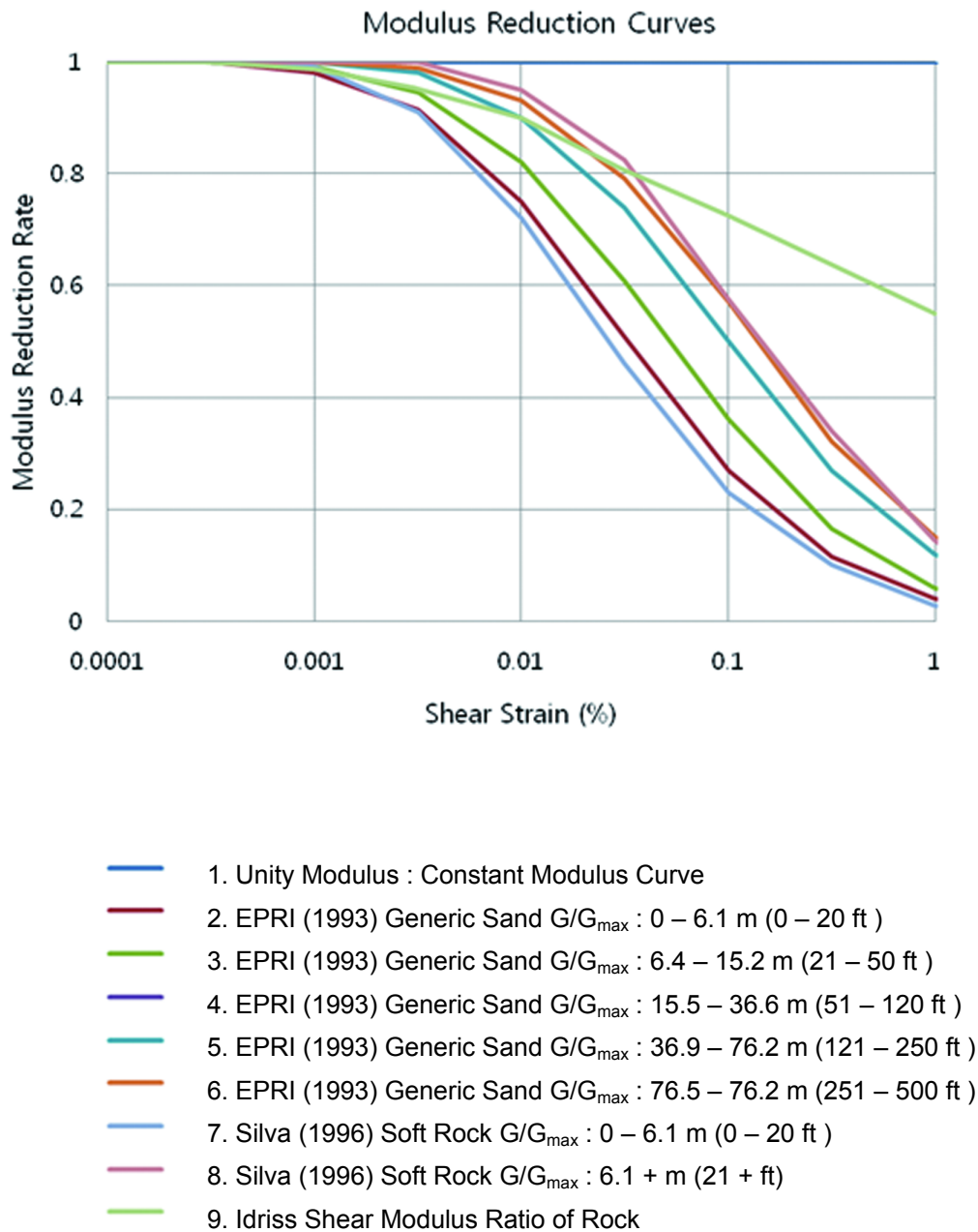


Figure 3.7A-1 Shear Modulus with Shear Strain

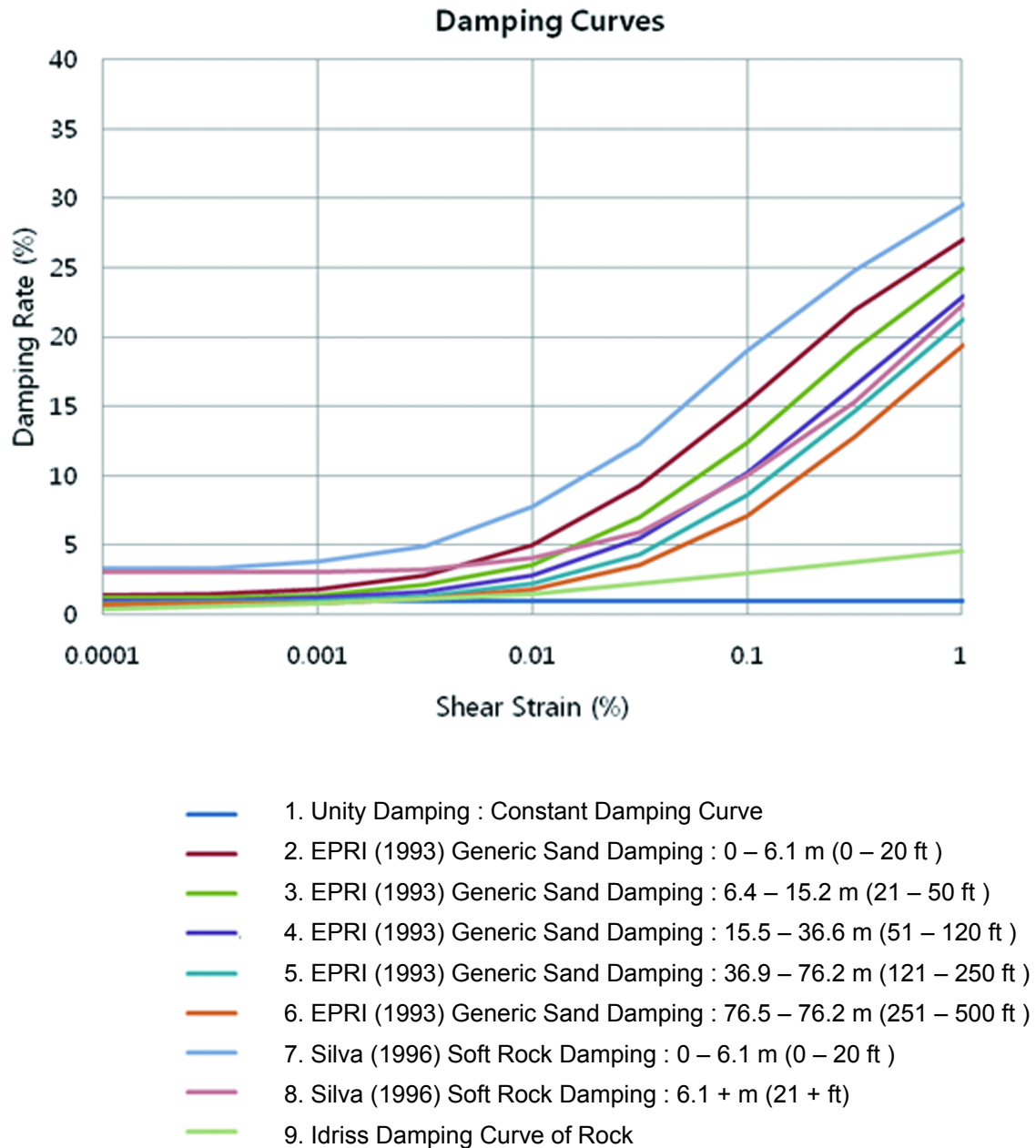


Figure 3.7A-2 Variation of Damping in the Soil with Shear Strain

APR1400 DCD TIER 2

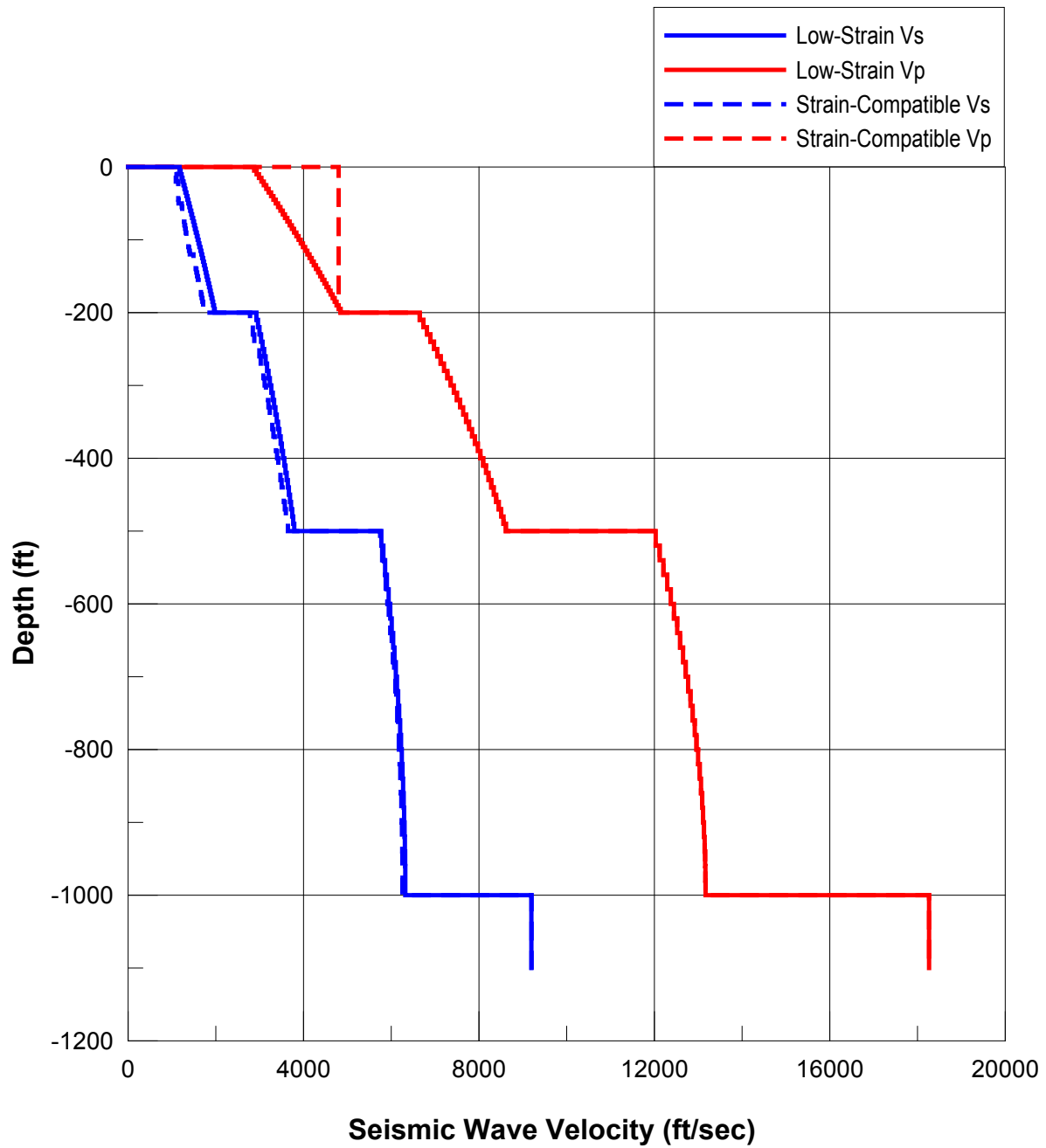


Figure 3.7A-3 Shear and Compression Wave Velocity Profiles for Case 1

APR1400 DCD TIER 2

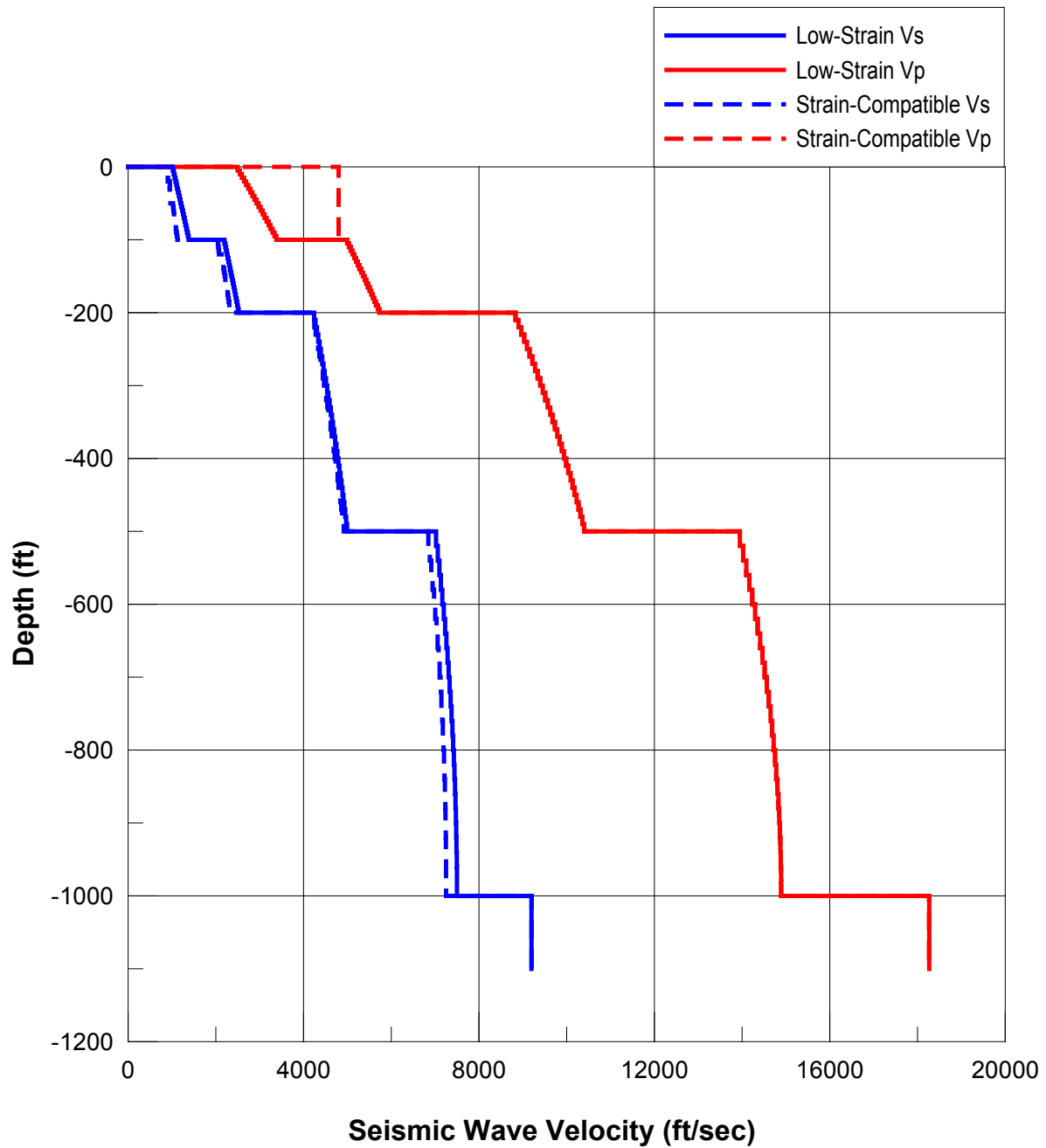


Figure 3.7A-4 Shear and Compression Wave Velocity Profiles for Case 2

APR1400 DCD TIER 2

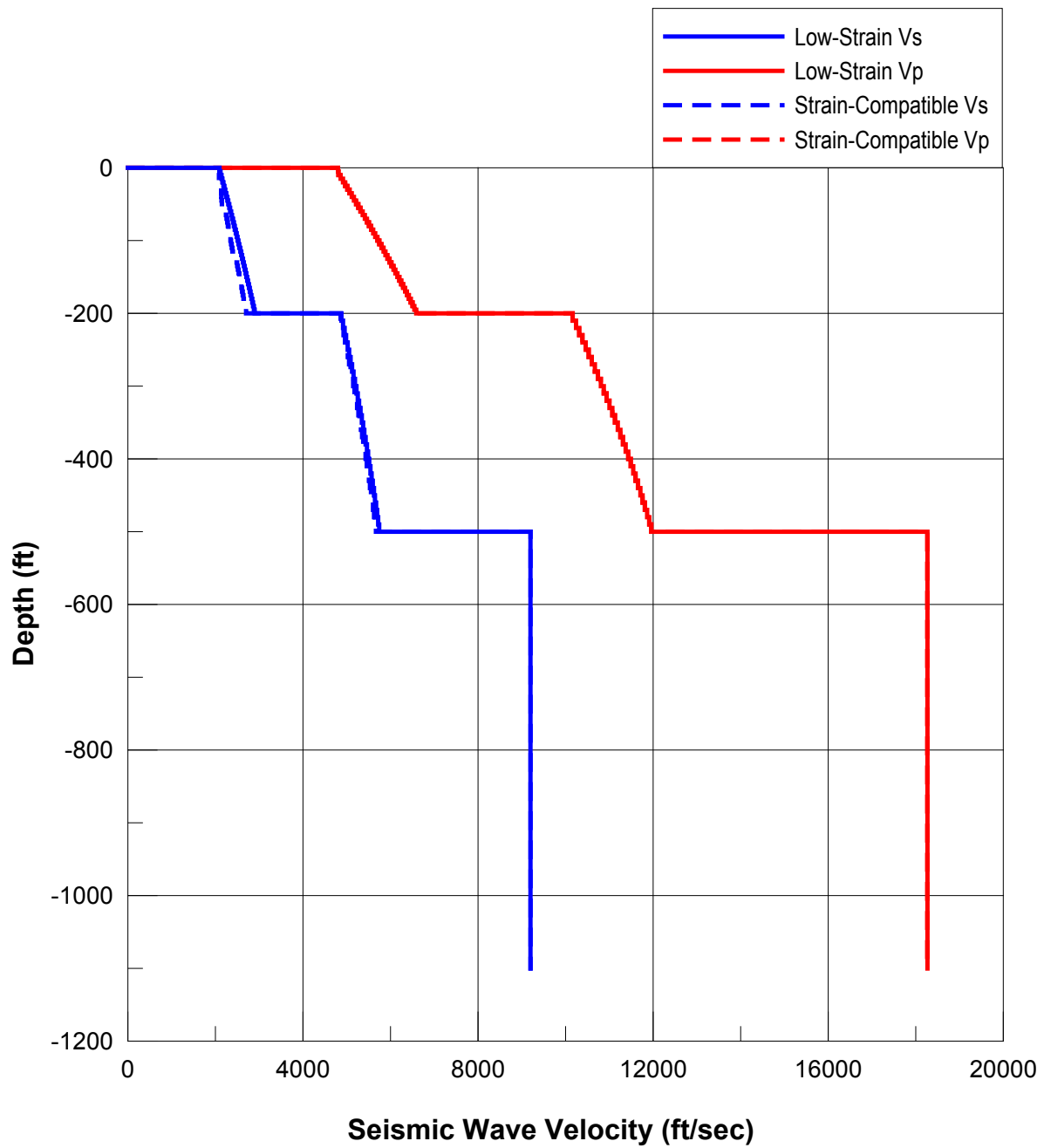


Figure 3.7A-5 Shear and Compression Wave Velocity Profiles for Case 3

APR1400 DCD TIER 2

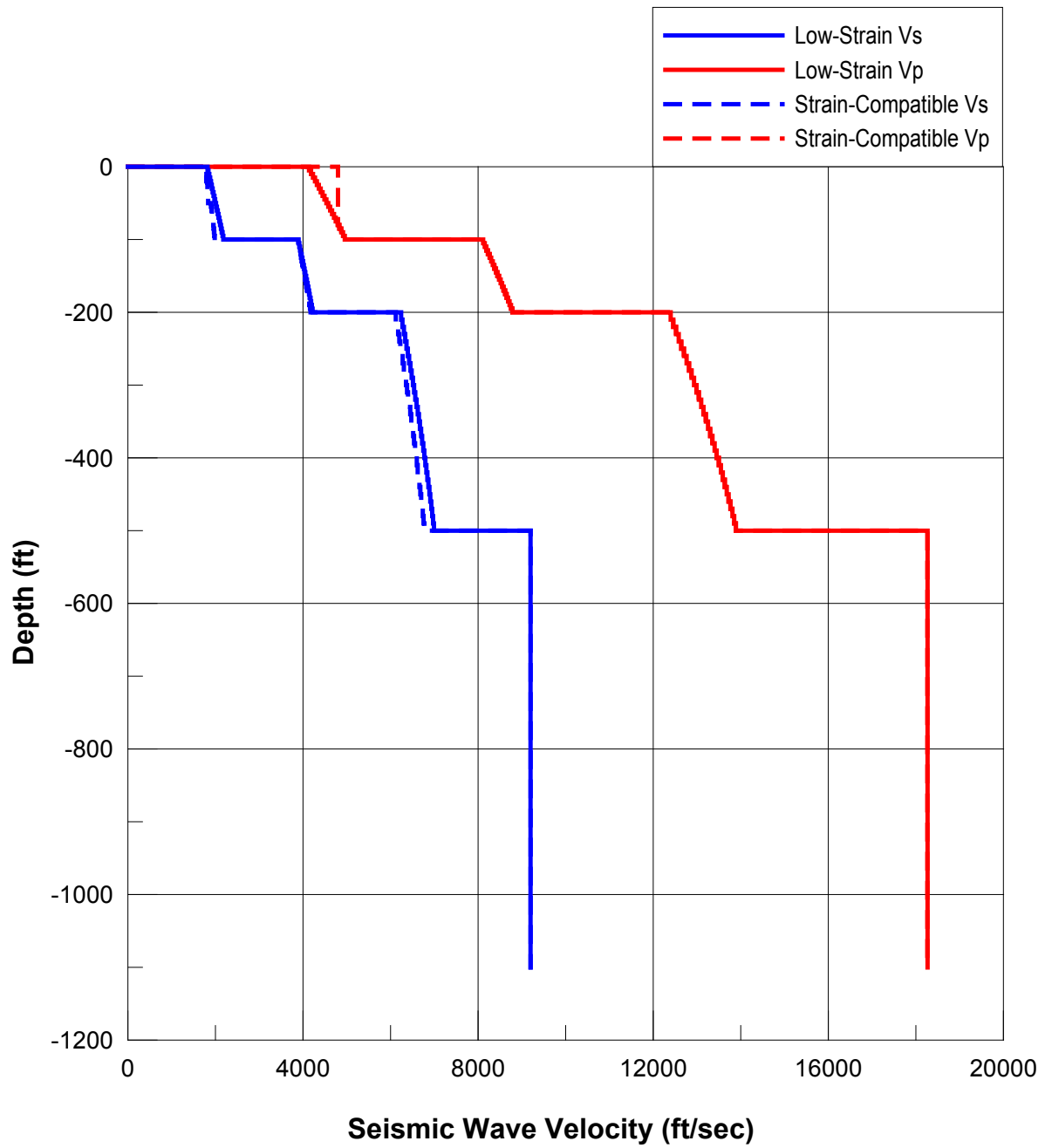


Figure 3.7A-6 Shear and Compression Wave Velocity Profiles for Case 4

APR1400 DCD TIER 2

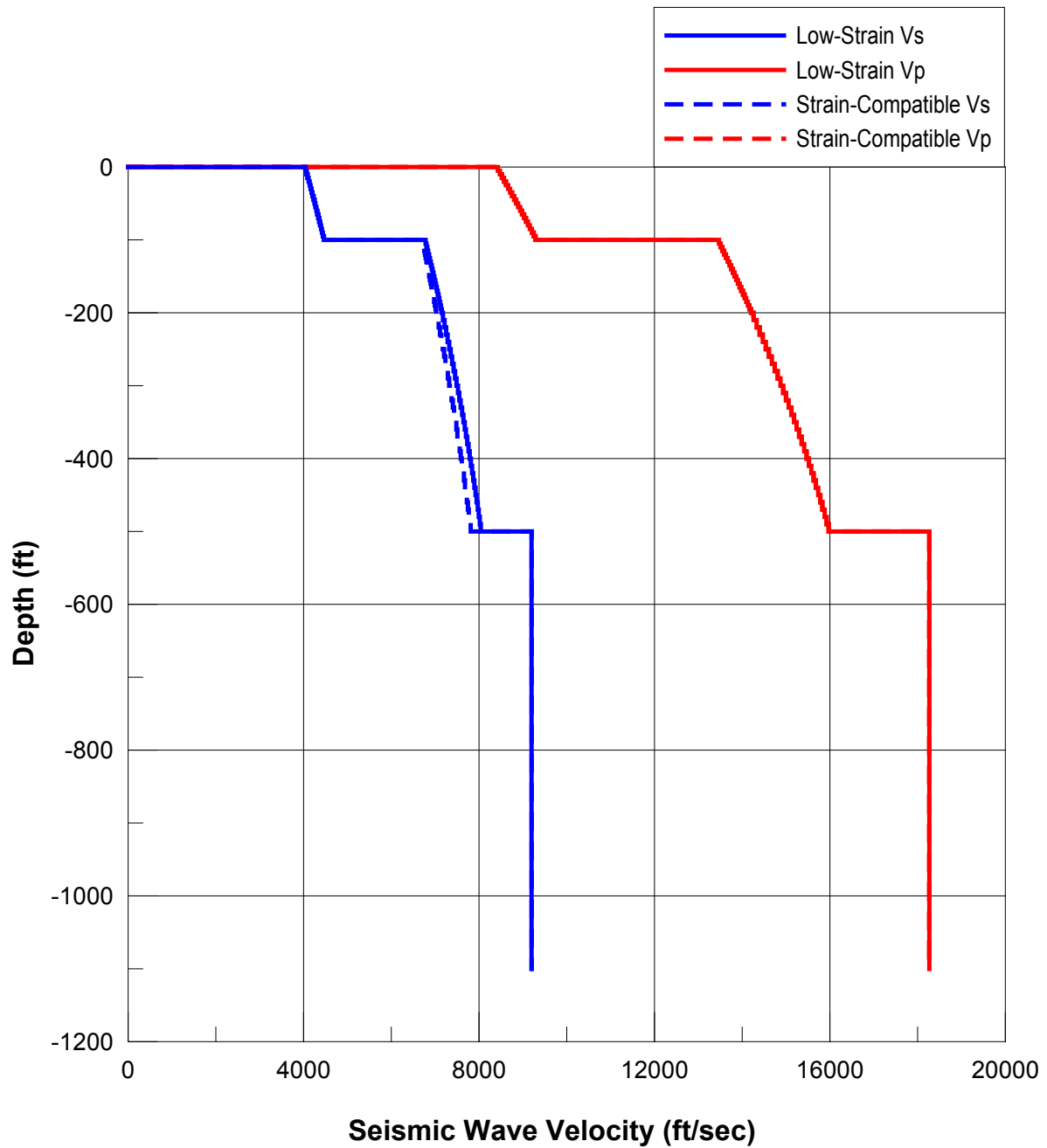


Figure 3.7A-7 Shear and Compression Wave Velocity Profiles for Case 5

APR1400 DCD TIER 2

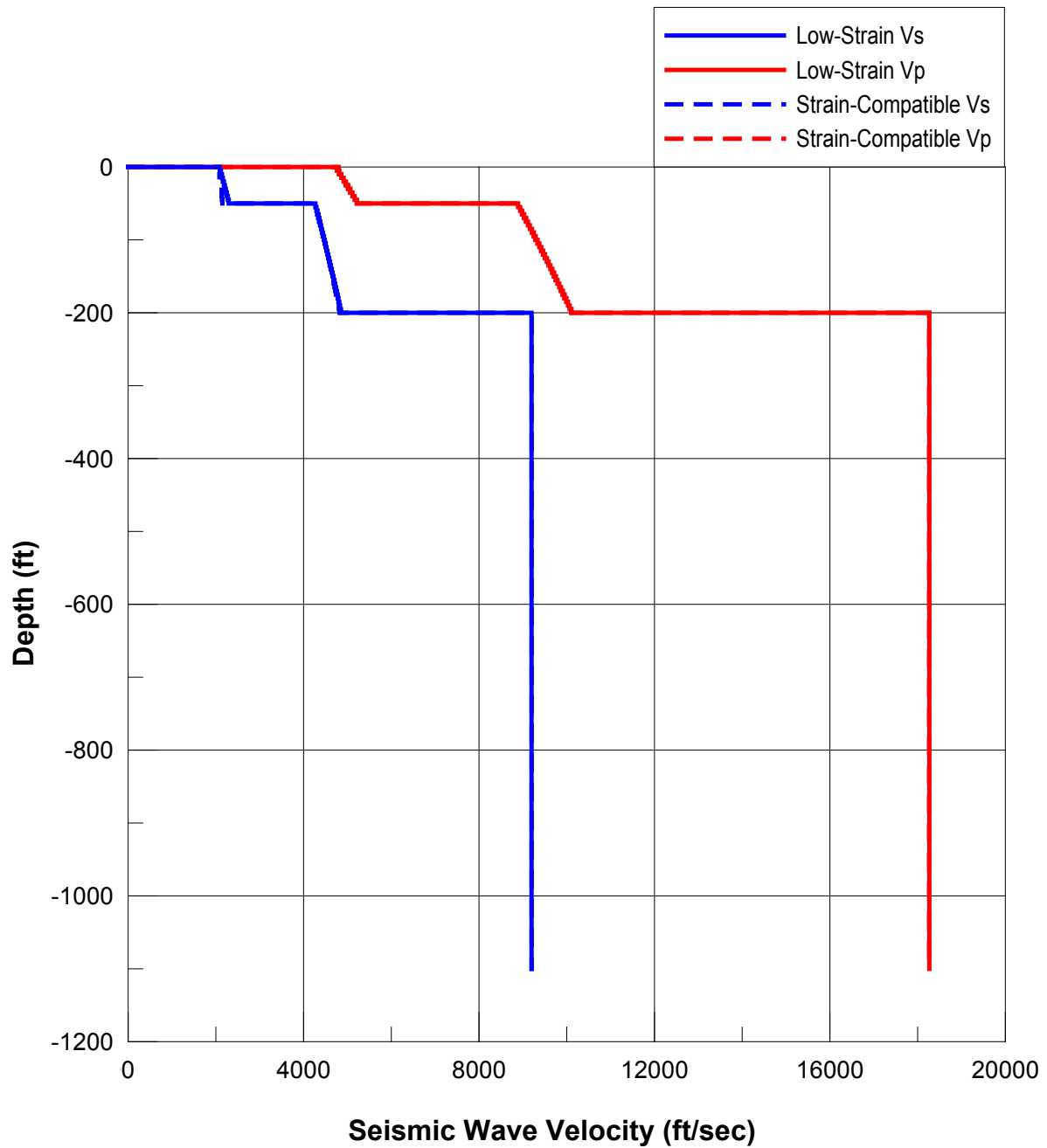


Figure 3.7A-8 Shear and Compression Wave Velocity Profiles for Case 6

APR1400 DCD TIER 2

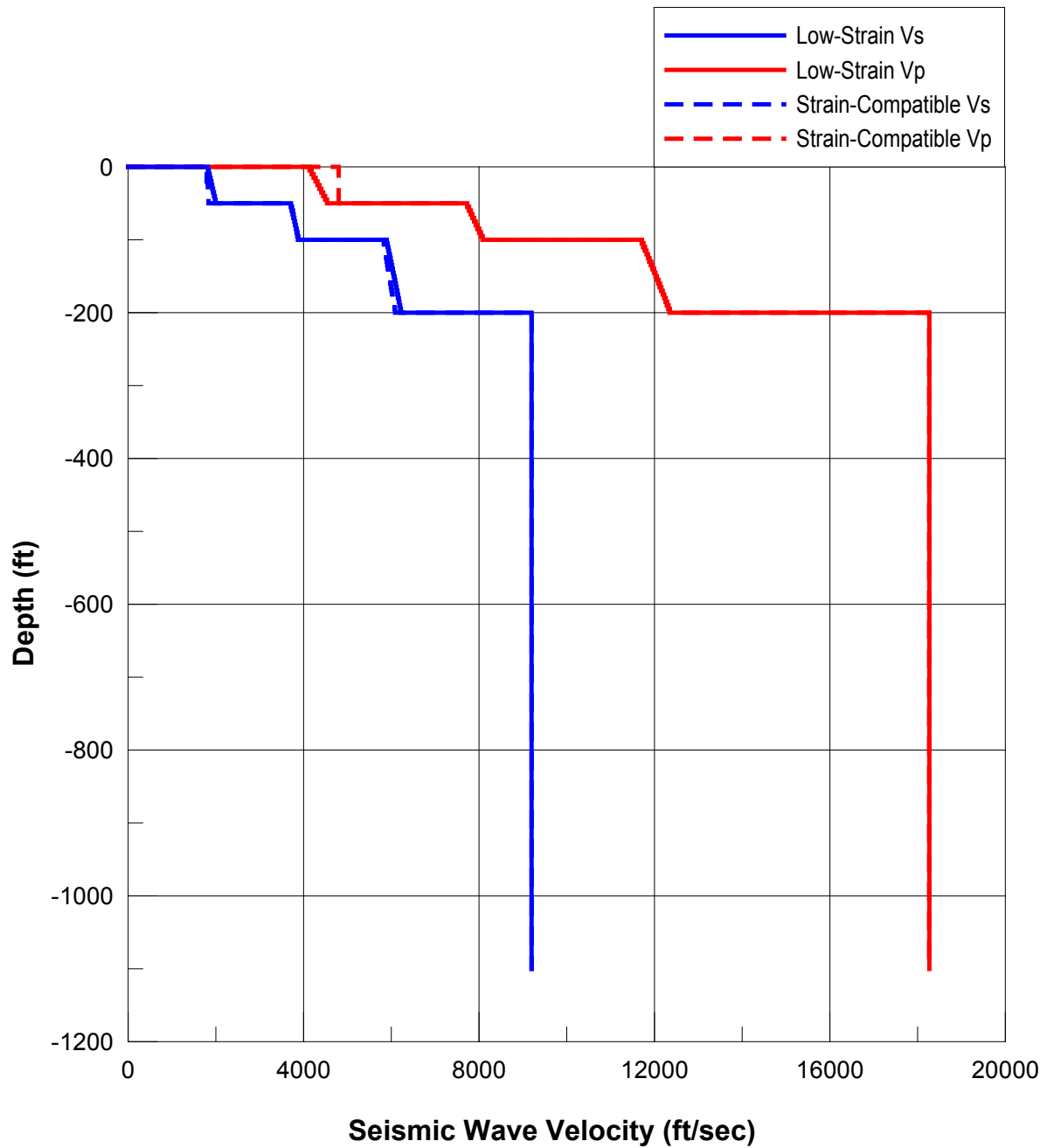


Figure 3.7A-9 Shear and Compression Wave Velocity Profiles for Case 7

APR1400 DCD TIER 2

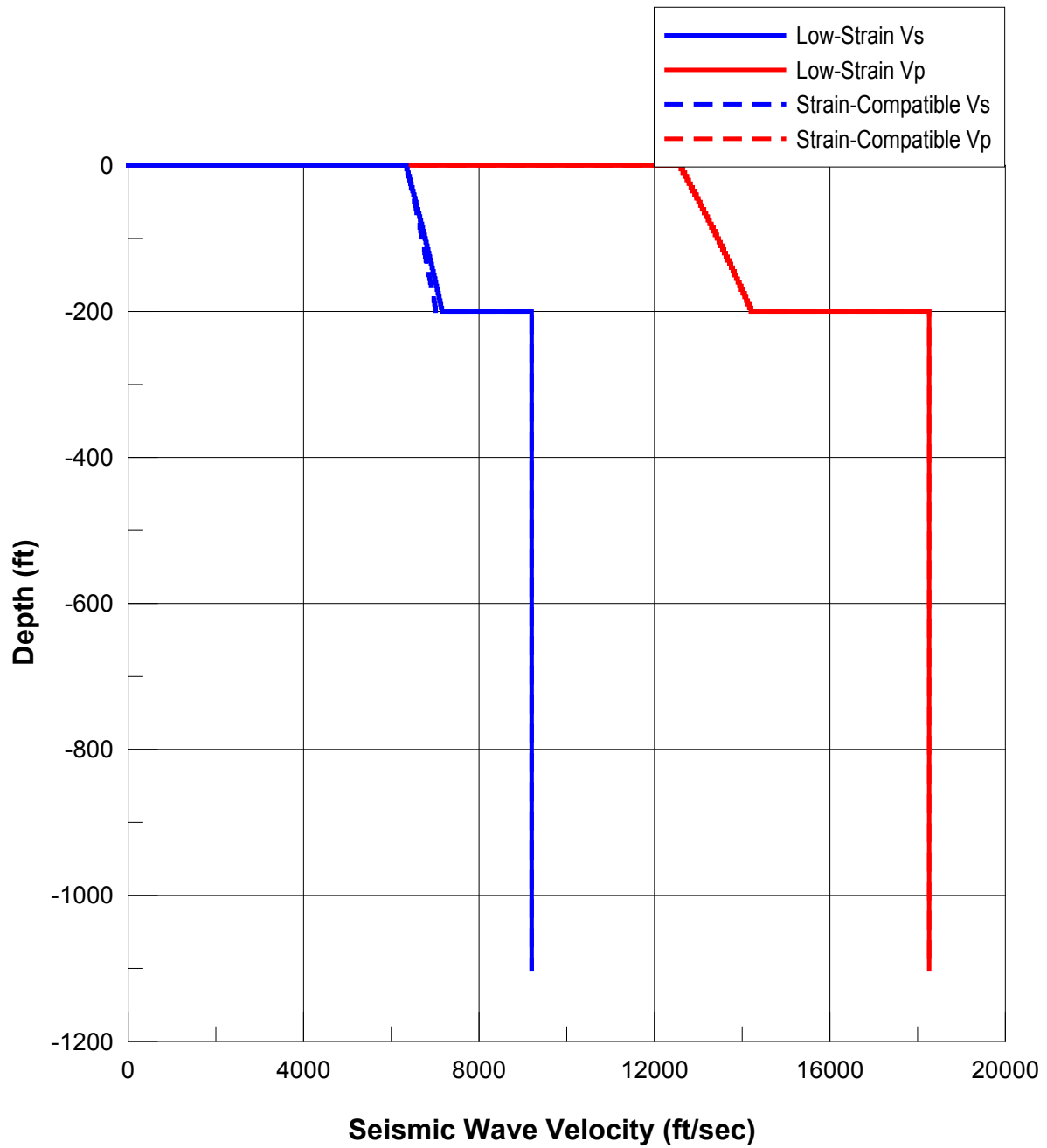


Figure 3.7A-10 Shear and Compression Wave Velocity Profiles for Case 8

APR1400 DCD TIER 2

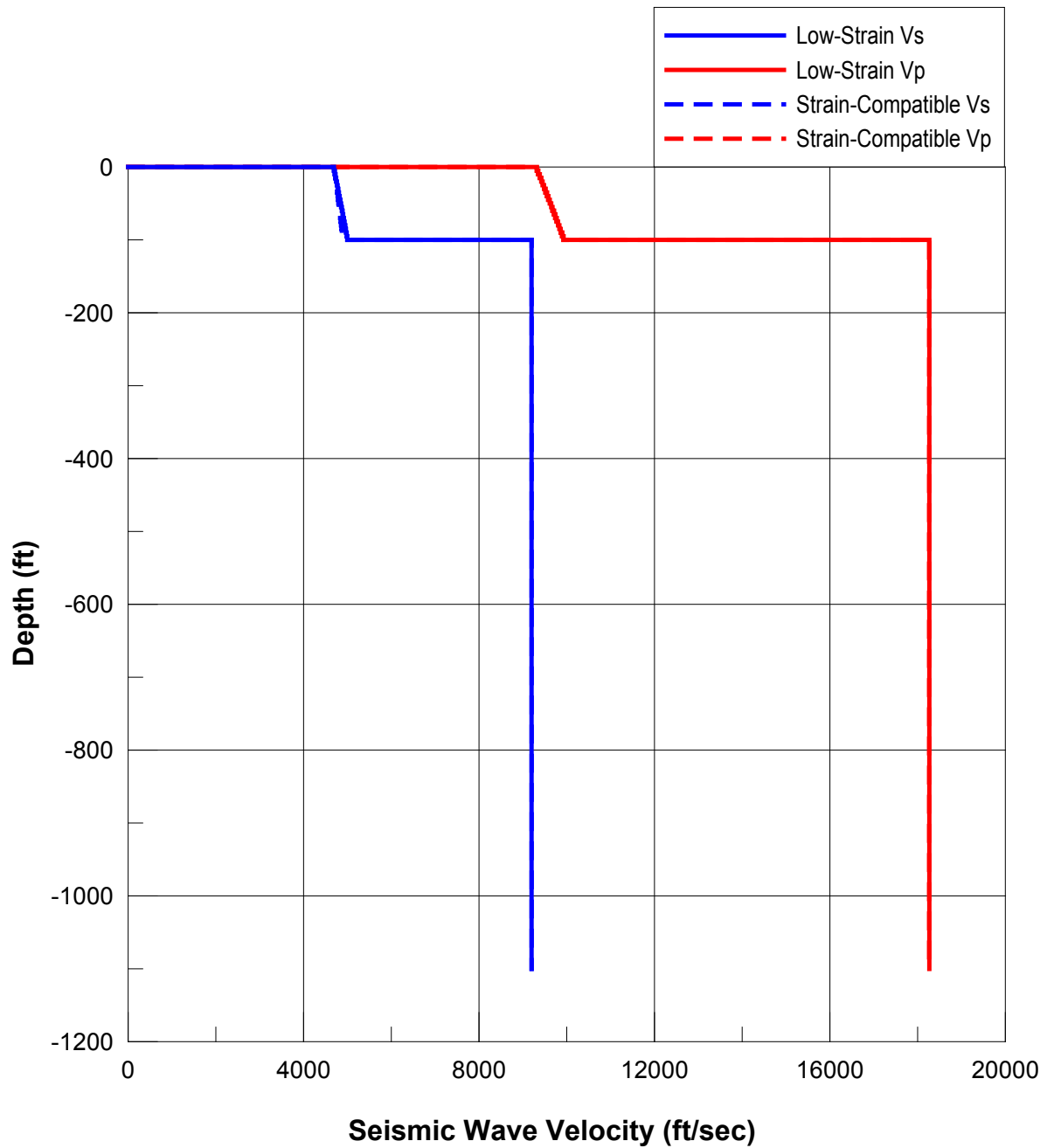


Figure 3.7A-11 Shear and Compression Wave Velocity Profiles for Case 9

APR1400 DCD TIER 2

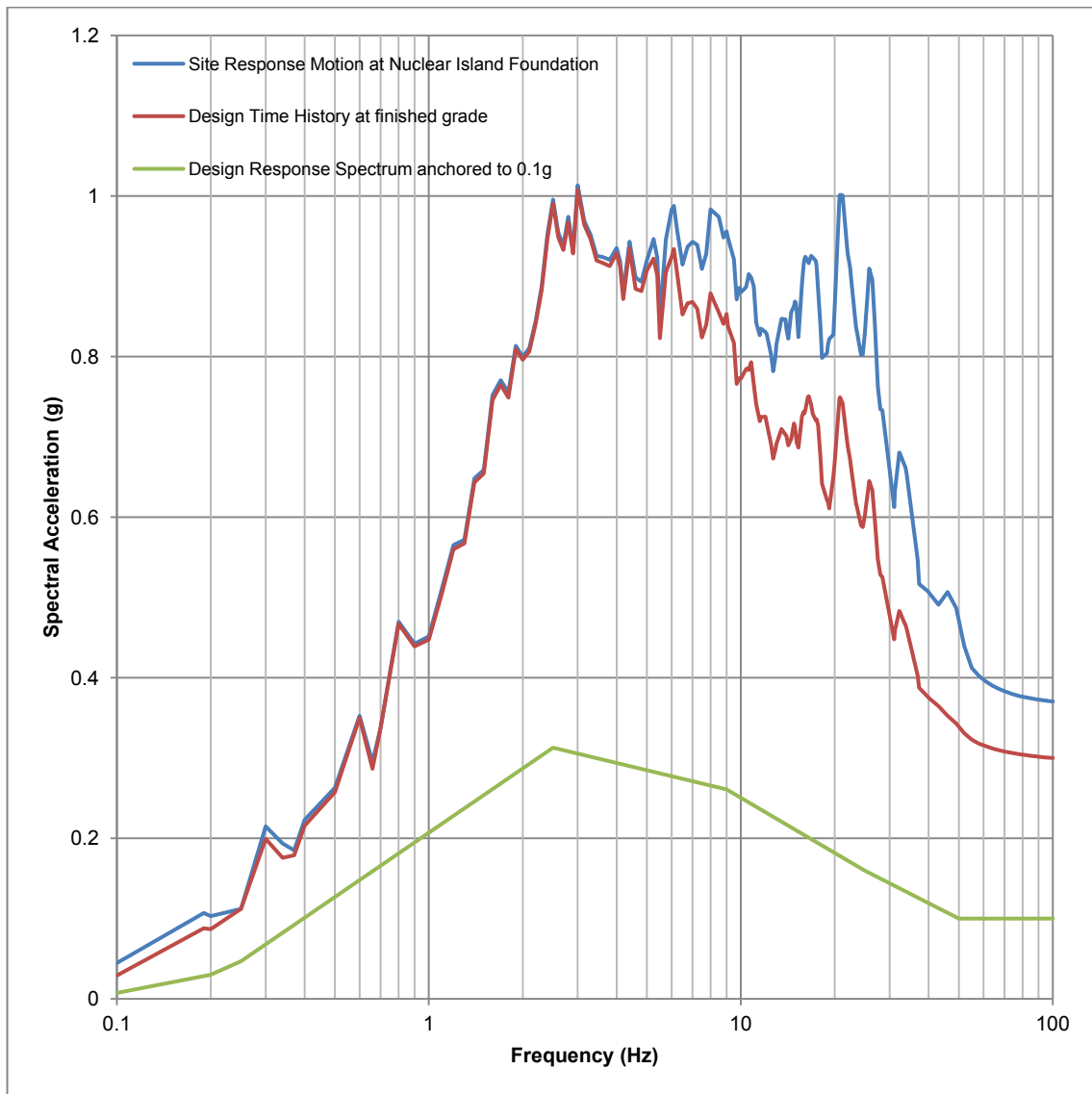


Figure 3.7A-12 Comparison of Design Time History Compatible with CSDRS with Site Response Motion at EL. 45'-0", E-W Motion, 5% damping

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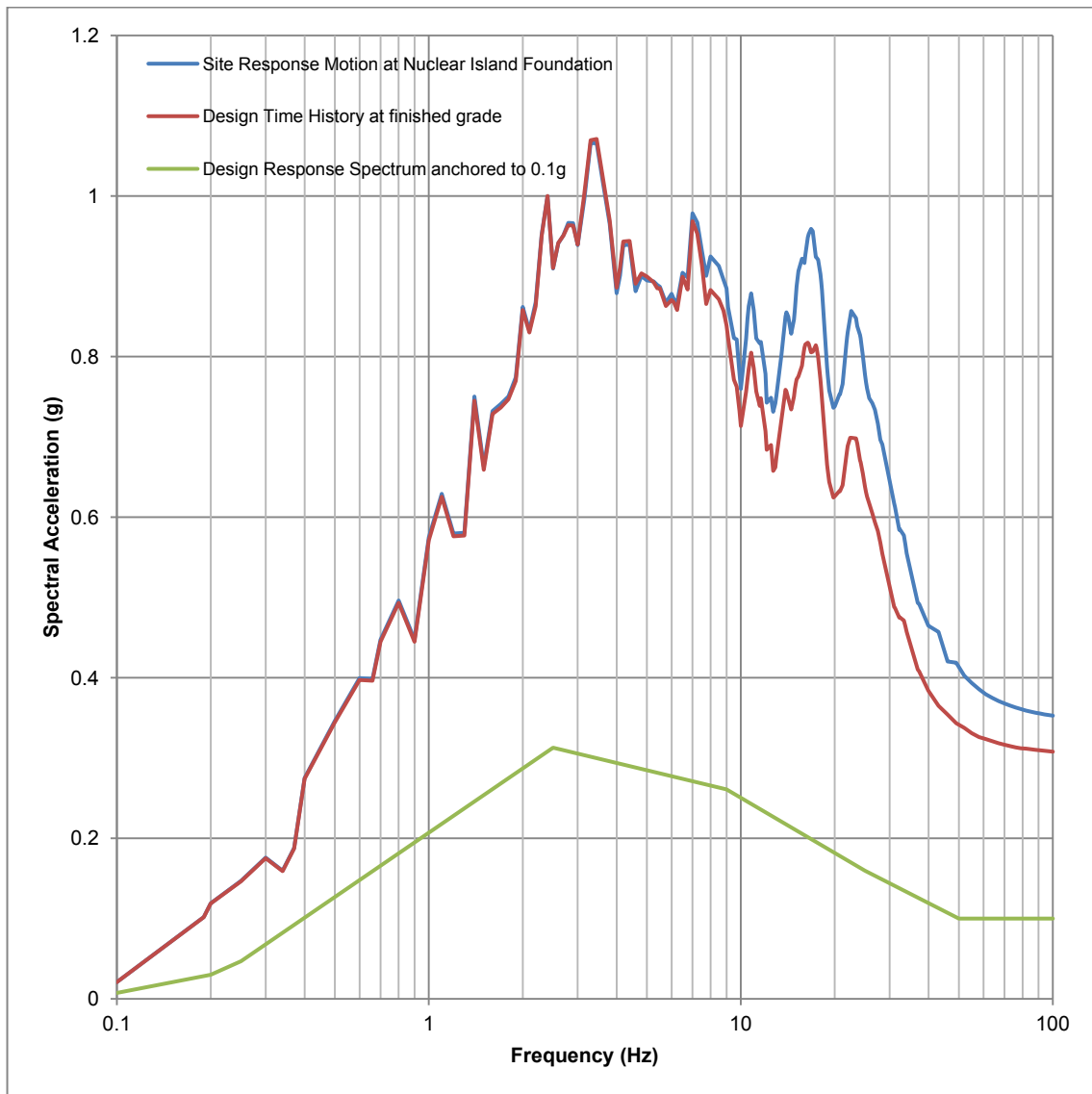


Figure 3.7A-13 Comparison of Design Time History Compatible with CSDRS with Site Response Motion at EL. 45'-0", N-S Motion, 5% damping

APR1400 DCD TIER 2

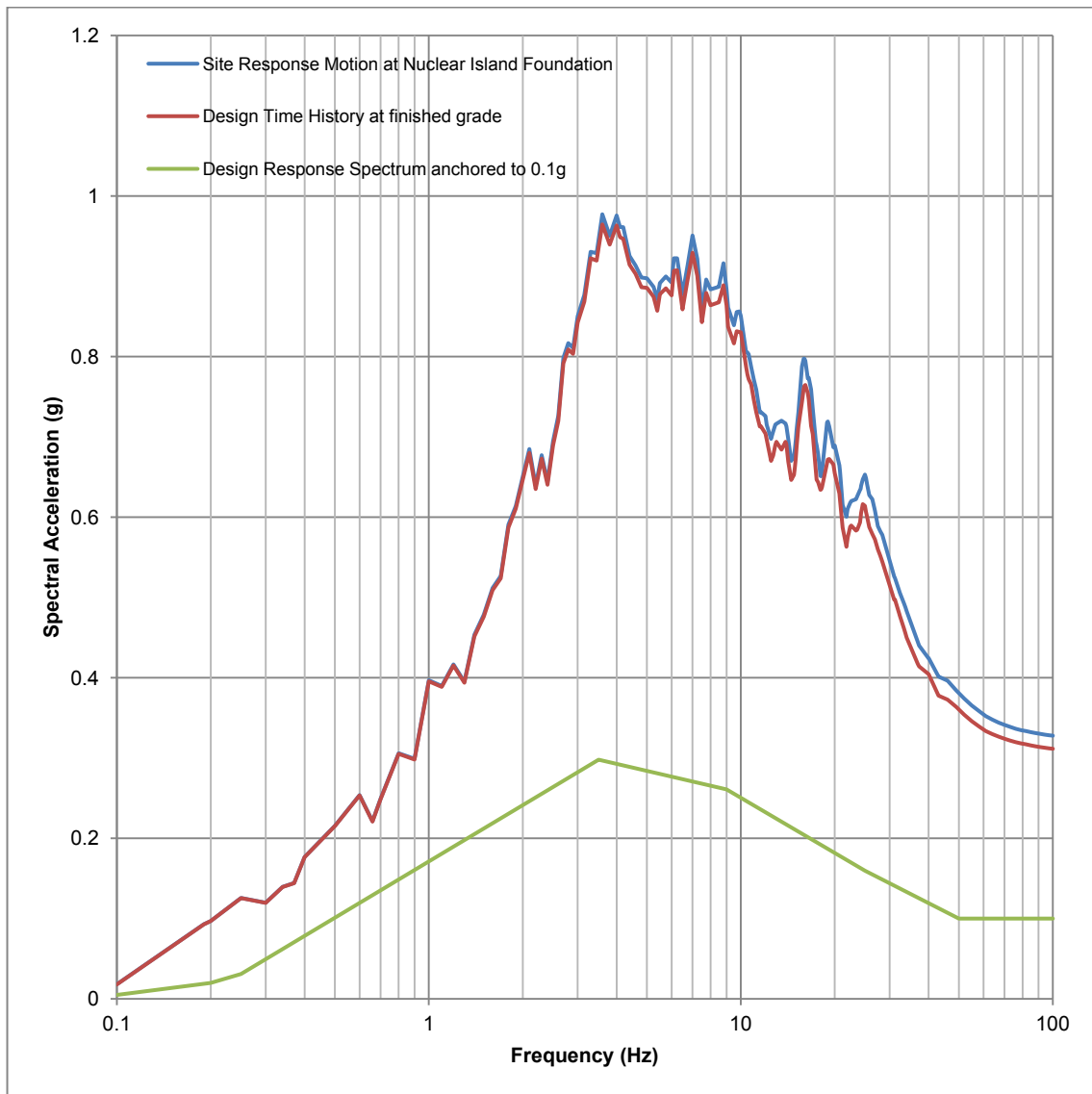


Figure 3.7A-14 Comparison of Design Time History Compatible with CSDRS with Site Response Motion at EL. 45'-0", Vertical Motion, 5% damping

APR1400 DCD TIER 2

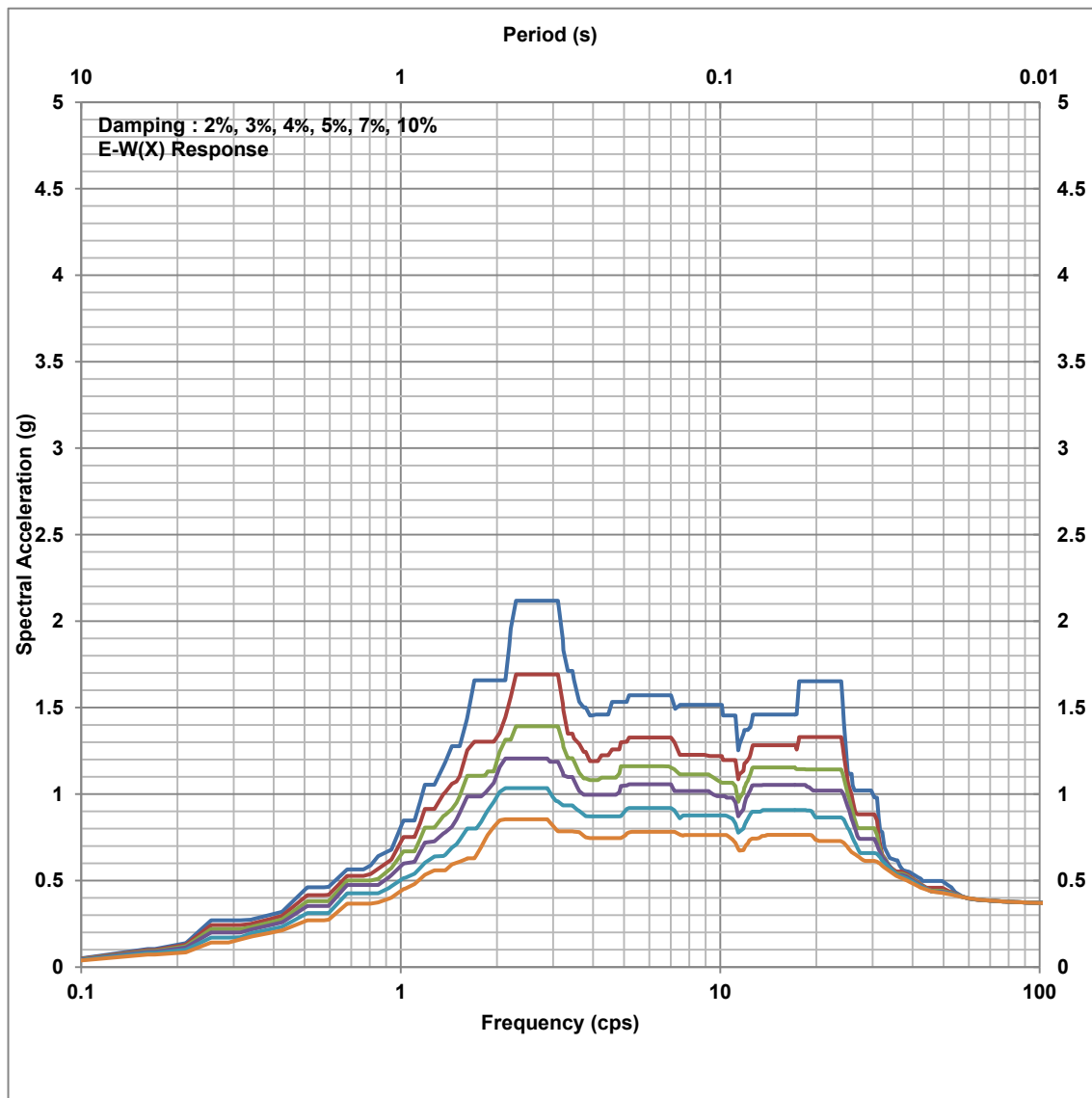


Figure 3.7A-15 Enveloped ISRS for SSE, Reactor Containment Building PSW
at EL.78'-0", E-W Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

APR1400 DCD TIER 2

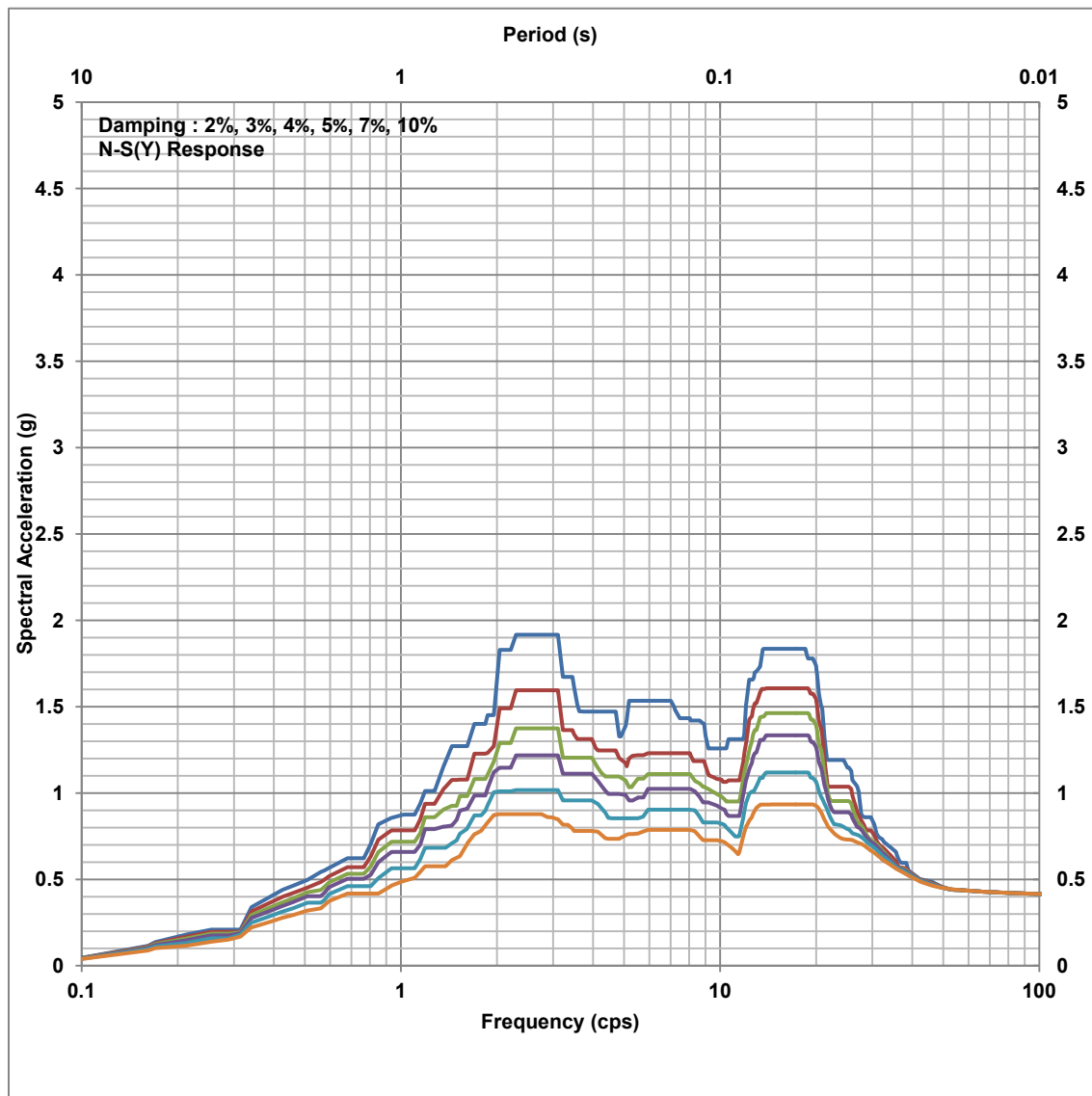


Figure 3.7A-16 Enveloped ISRS for SSE, Reactor Containment Building PSW
at EL.78'-0", N-S Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

APR1400 DCD TIER 2

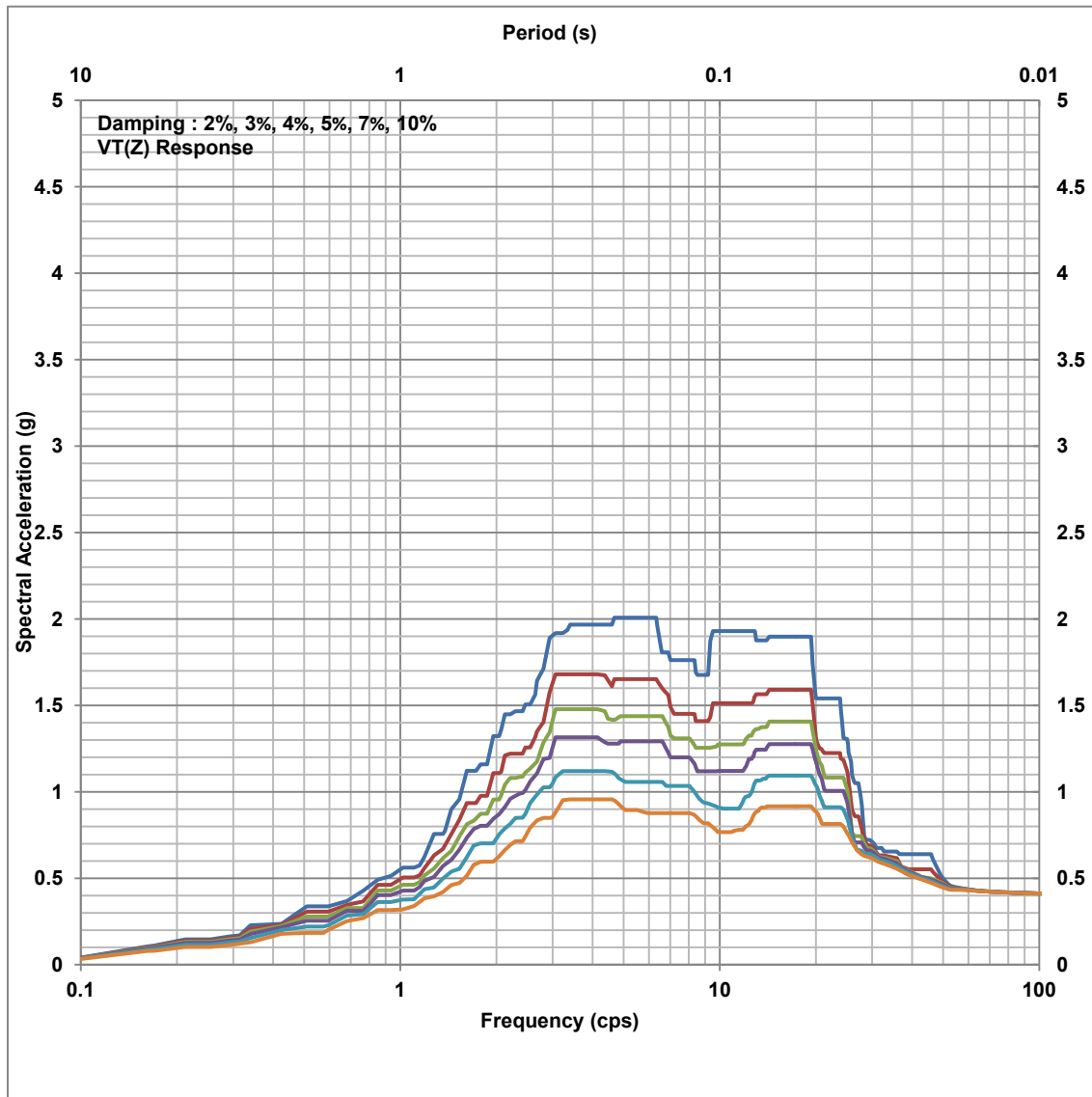


Figure 3.7A-17 Enveloped ISRS for SSE, Reactor Containment Building PSW
at EL.78'-0", Vertical, Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

APR1400 DCD TIER 2

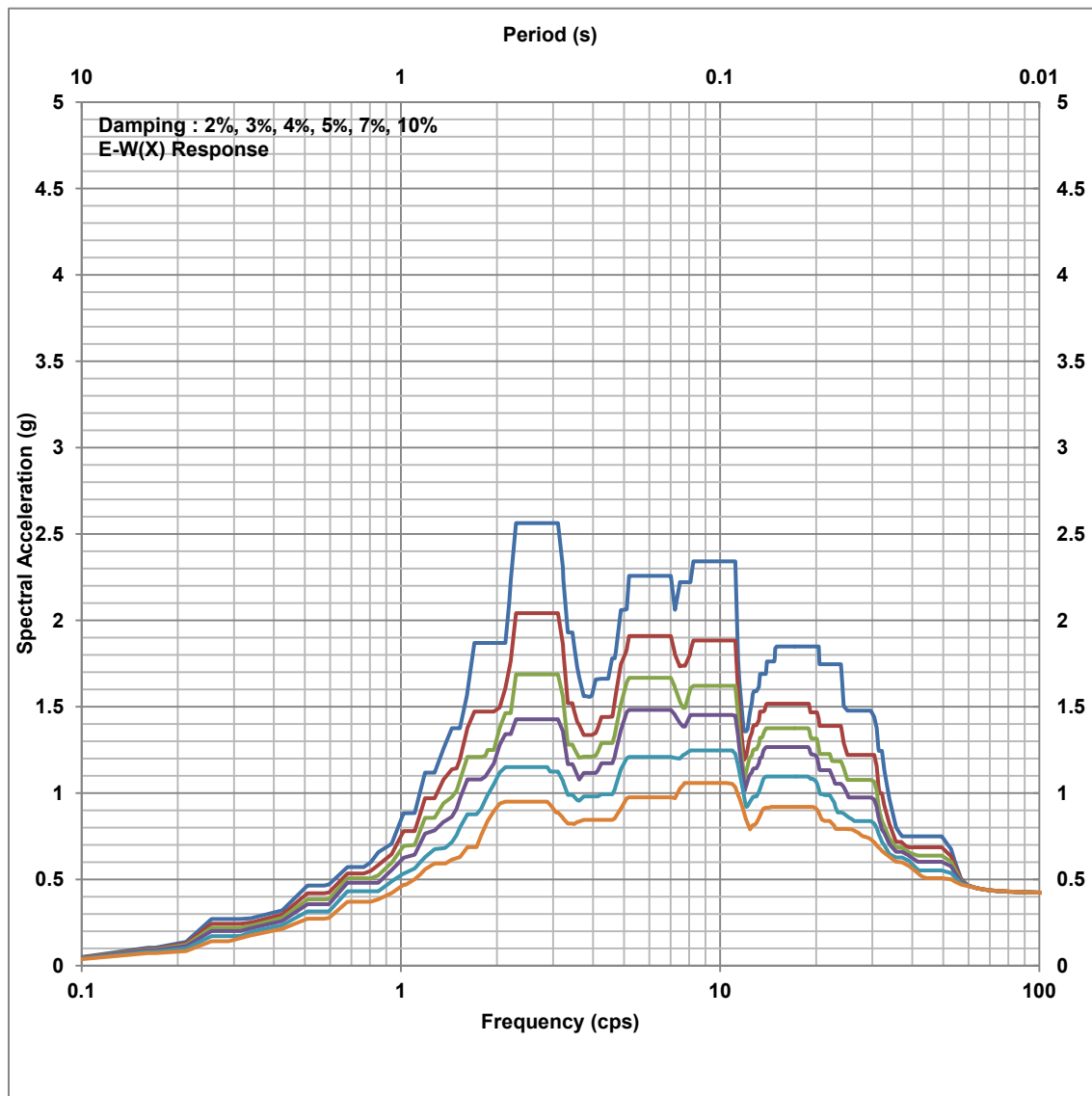


Figure 3.7A-18 Enveloped ISRS for SSE, Reactor Containment Building PSW
at EL.100'-0", E-W, Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

APR1400 DCD TIER 2

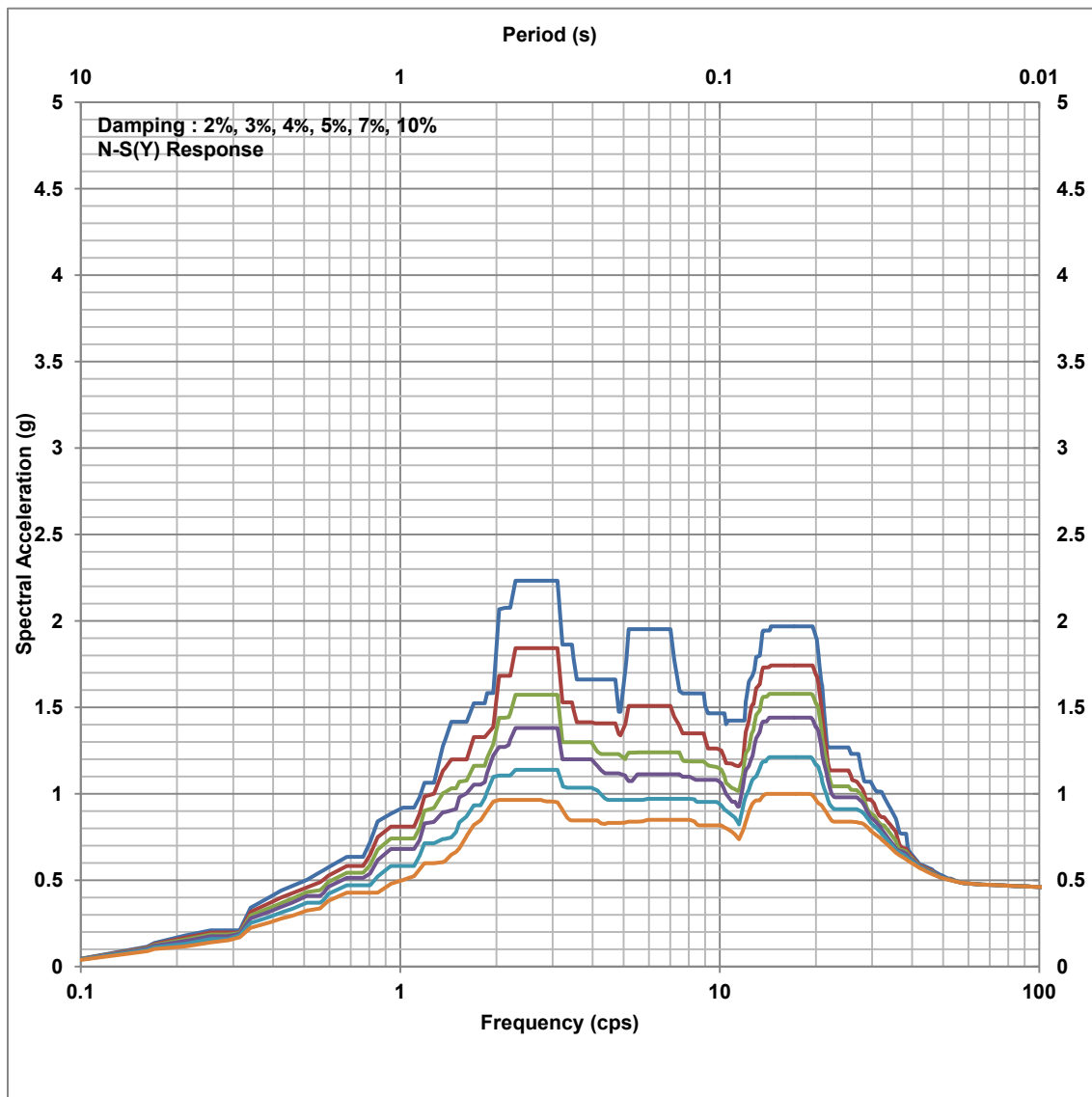


Figure 3.7A-19 Enveloped ISRS for SSE, Reactor Containment Building PSW
at EL.100'-0", N-S, Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

APR1400 DCD TIER 2

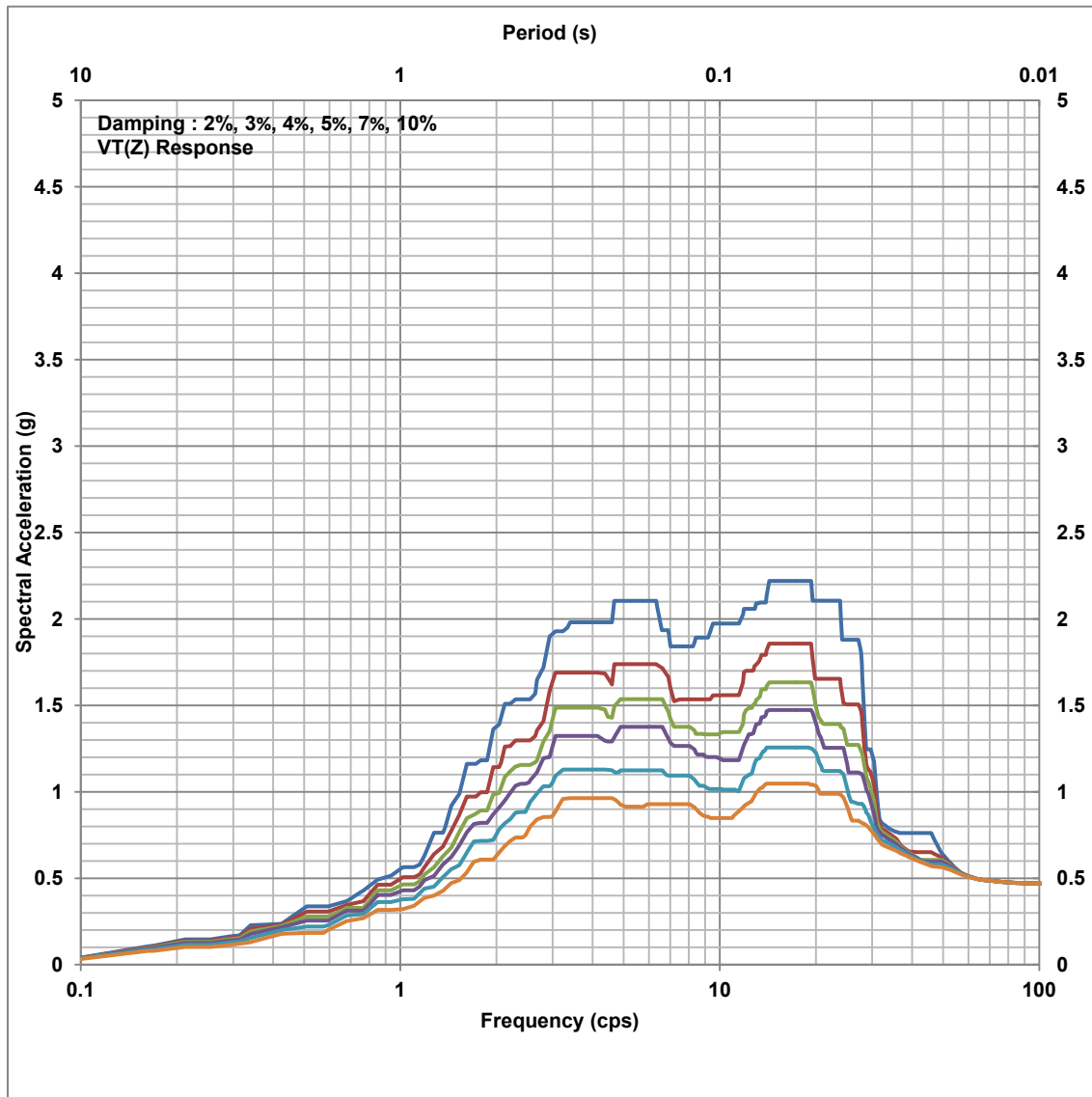


Figure 3.7A-20 Enveloped ISRS for SSE, Reactor Containment Building PSW
at EL.100'-0", Vertical, Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

APR1400 DCD TIER 2

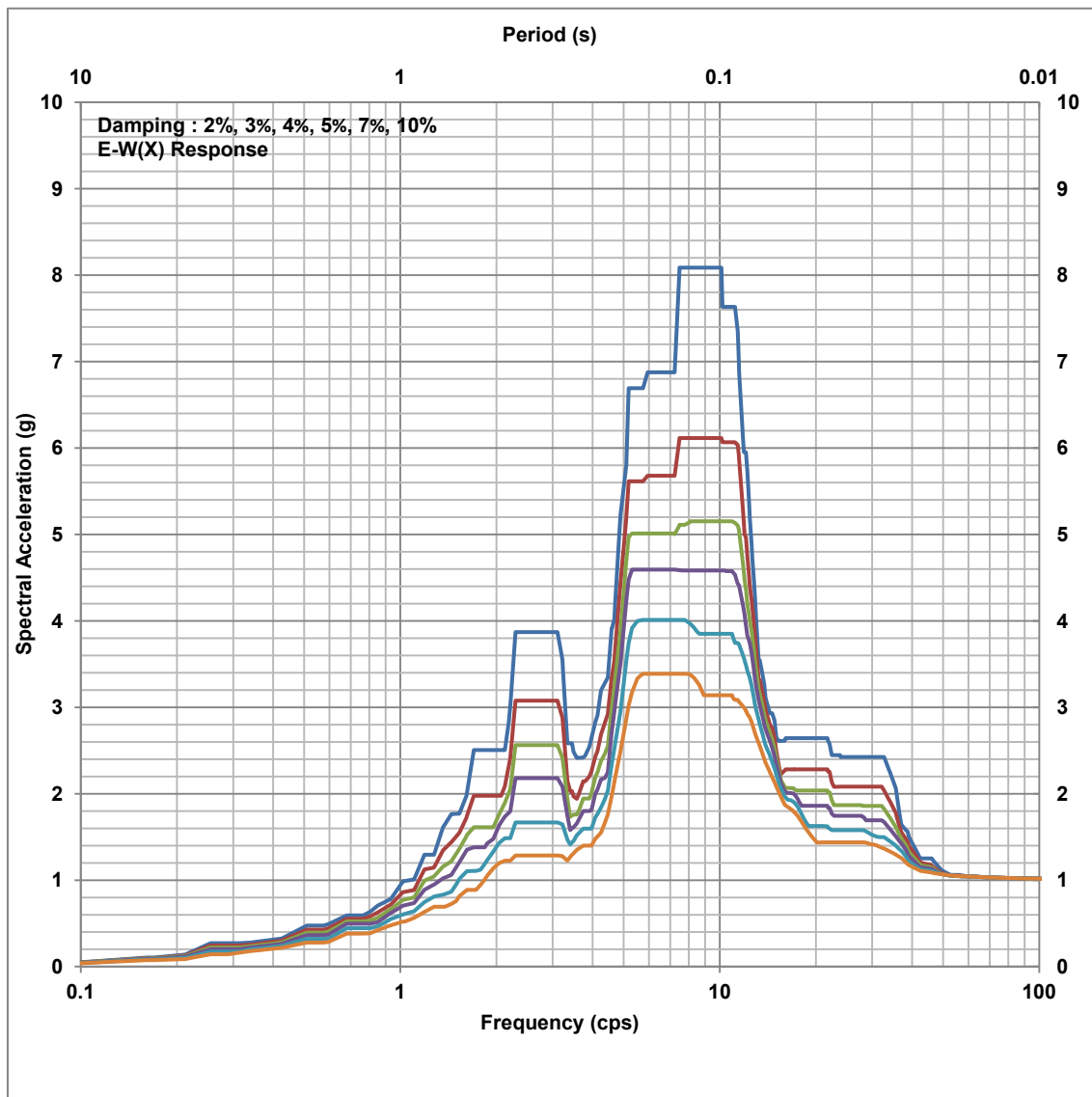


Figure 3.7A-21 Enveloped ISRS for SSE, Reactor Containment Building PSW
at EL.156'-0", E-W, Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

APR1400 DCD TIER 2

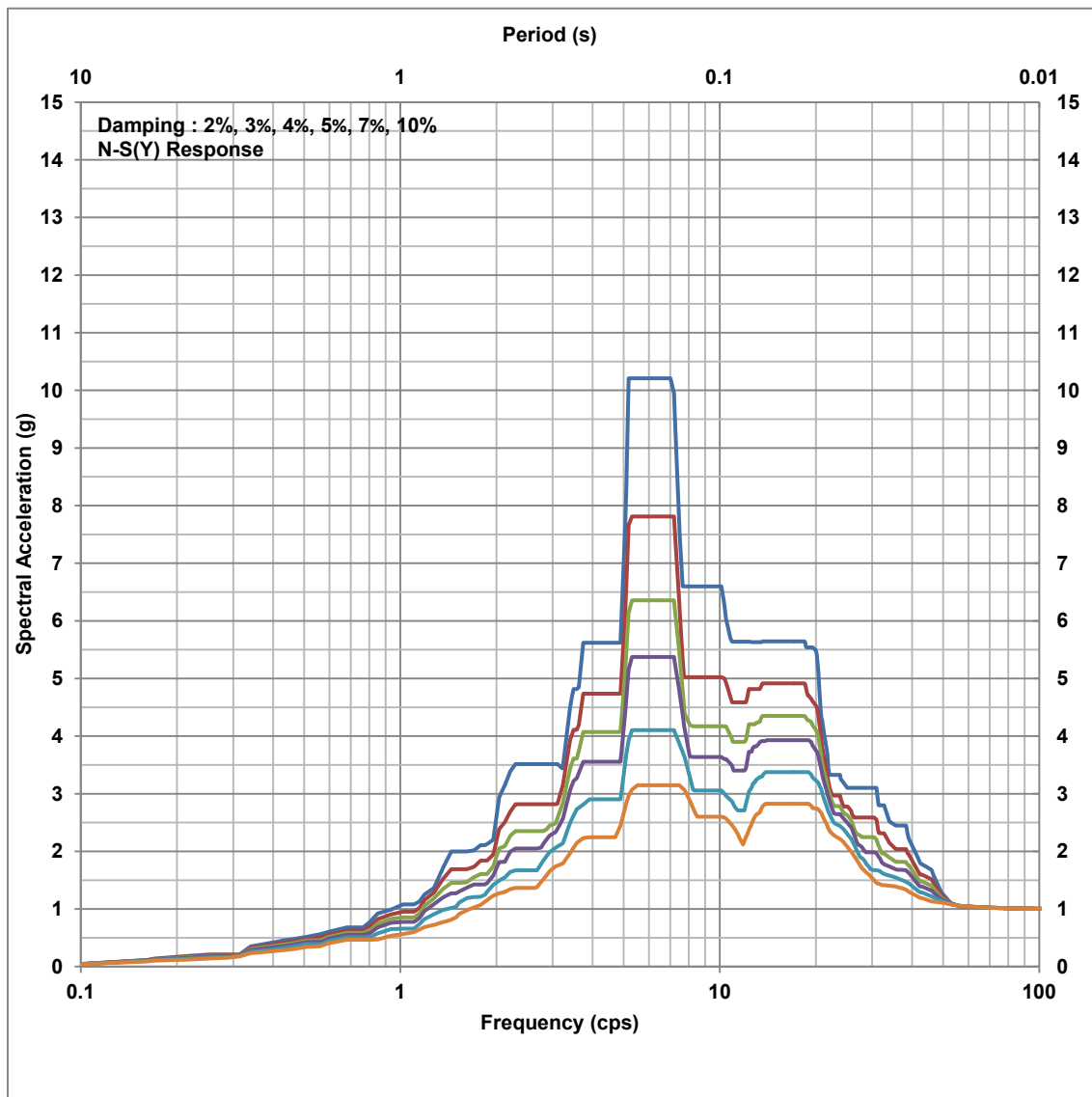


Figure 3.7A-22 Enveloped ISRS for SSE, Reactor Containment Building PSW at EL.156'-0", N-S, Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

APR1400 DCD TIER 2

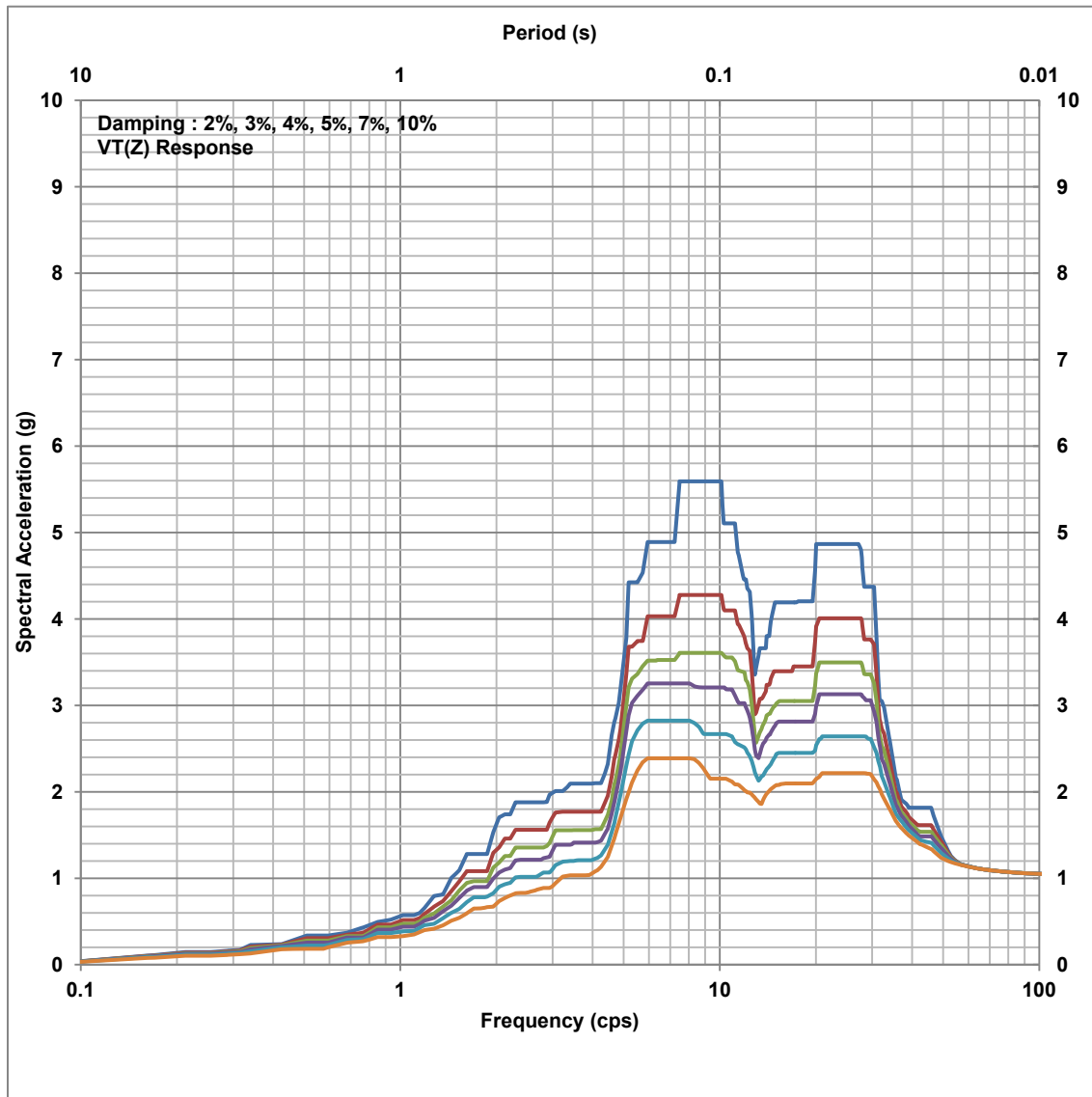


Figure 3.7A-23 Enveloped ISRS for SSE, Reactor Containment Building PSW
at EL.156'-0", Vertical, Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

APR1400 DCD TIER 2

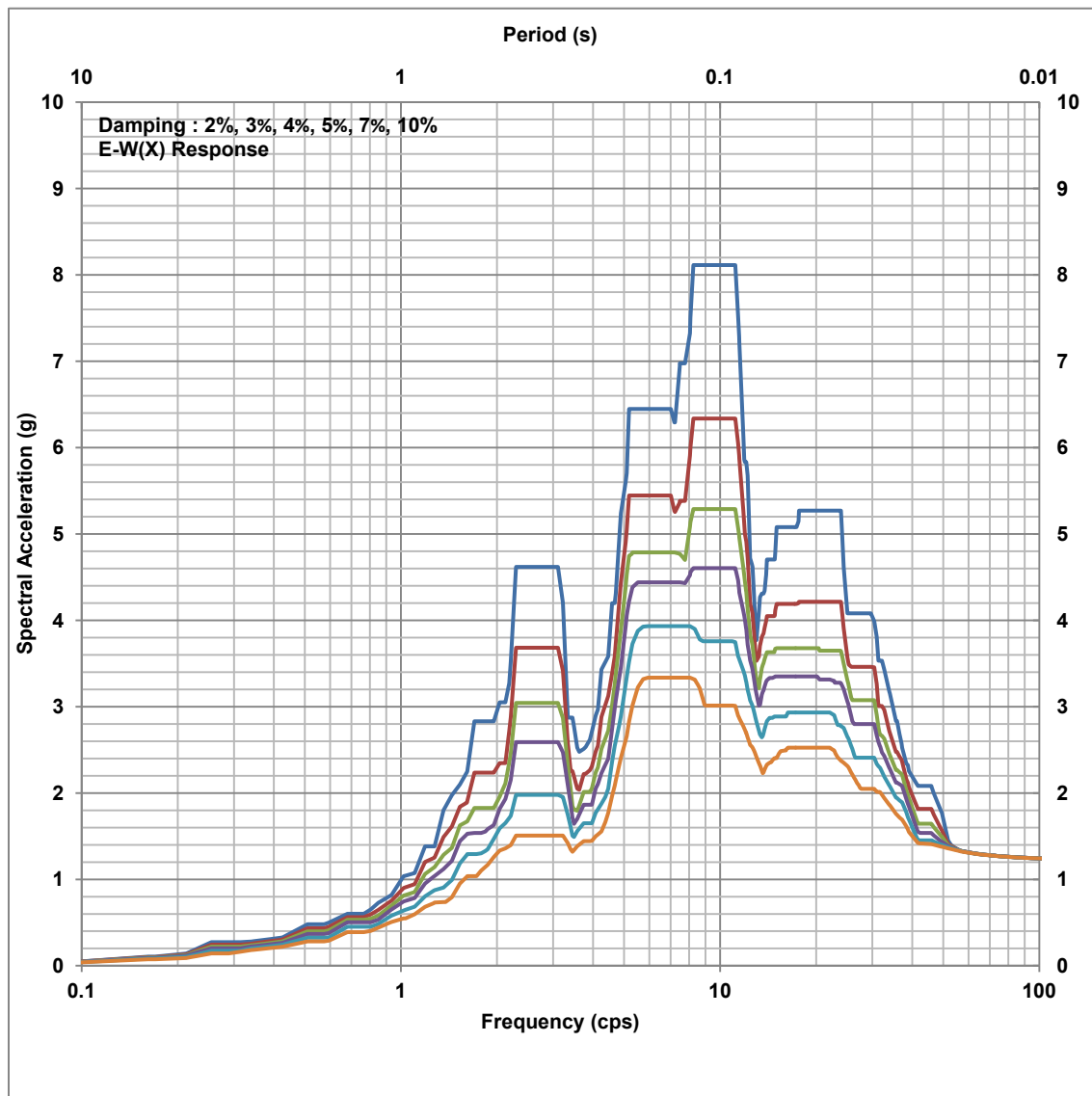


Figure 3.7A-24 Enveloped ISRS for SSE, Reactor Containment Building PSW at EL.191'-0" (General), E-W, Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

APR1400 DCD TIER 2

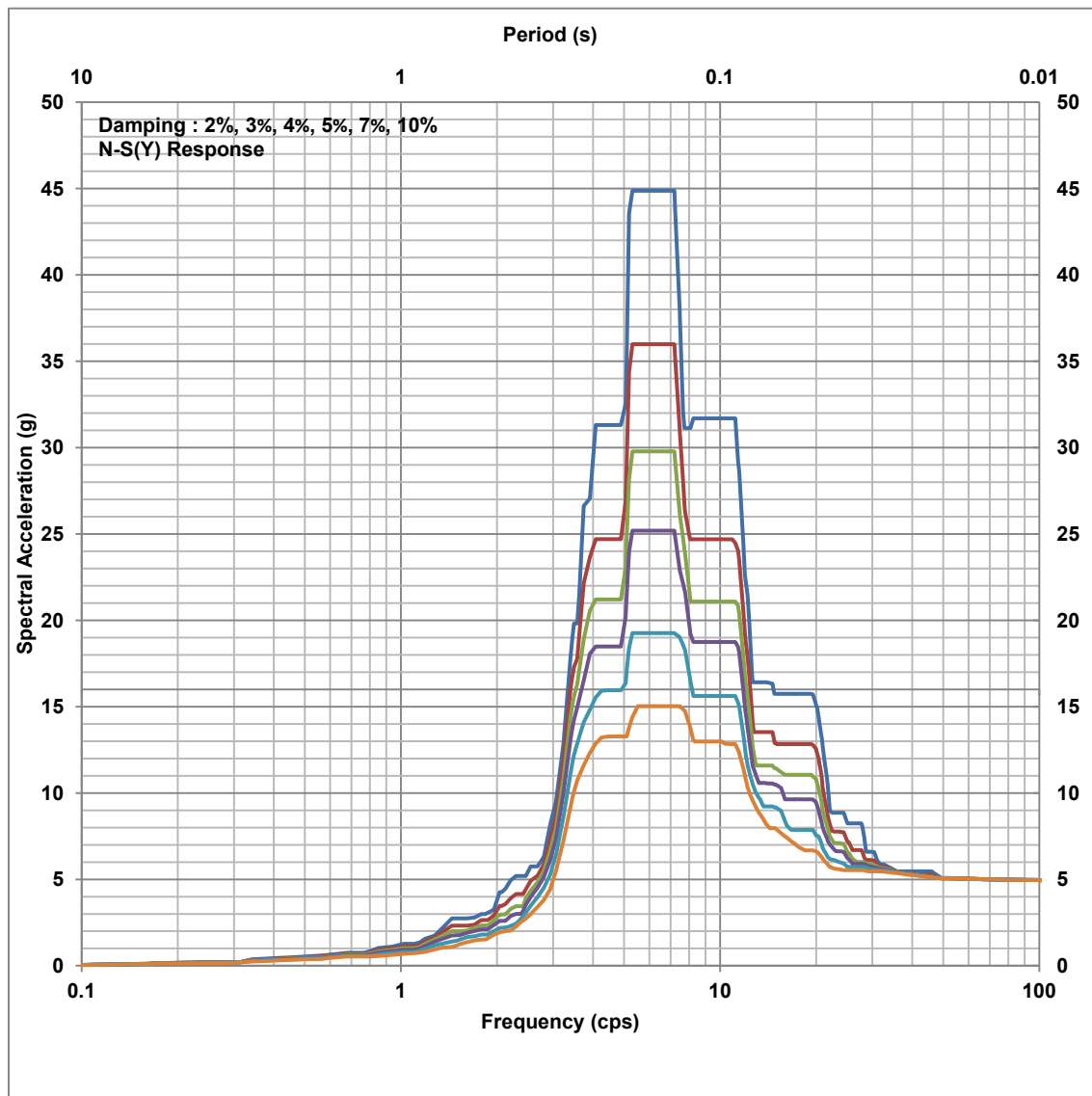


Figure 3.7A-25 Enveloped ISRS for SSE, Reactor Containment Building PSW at EL.191'-0" (General), N-S, Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

APR1400 DCD TIER 2

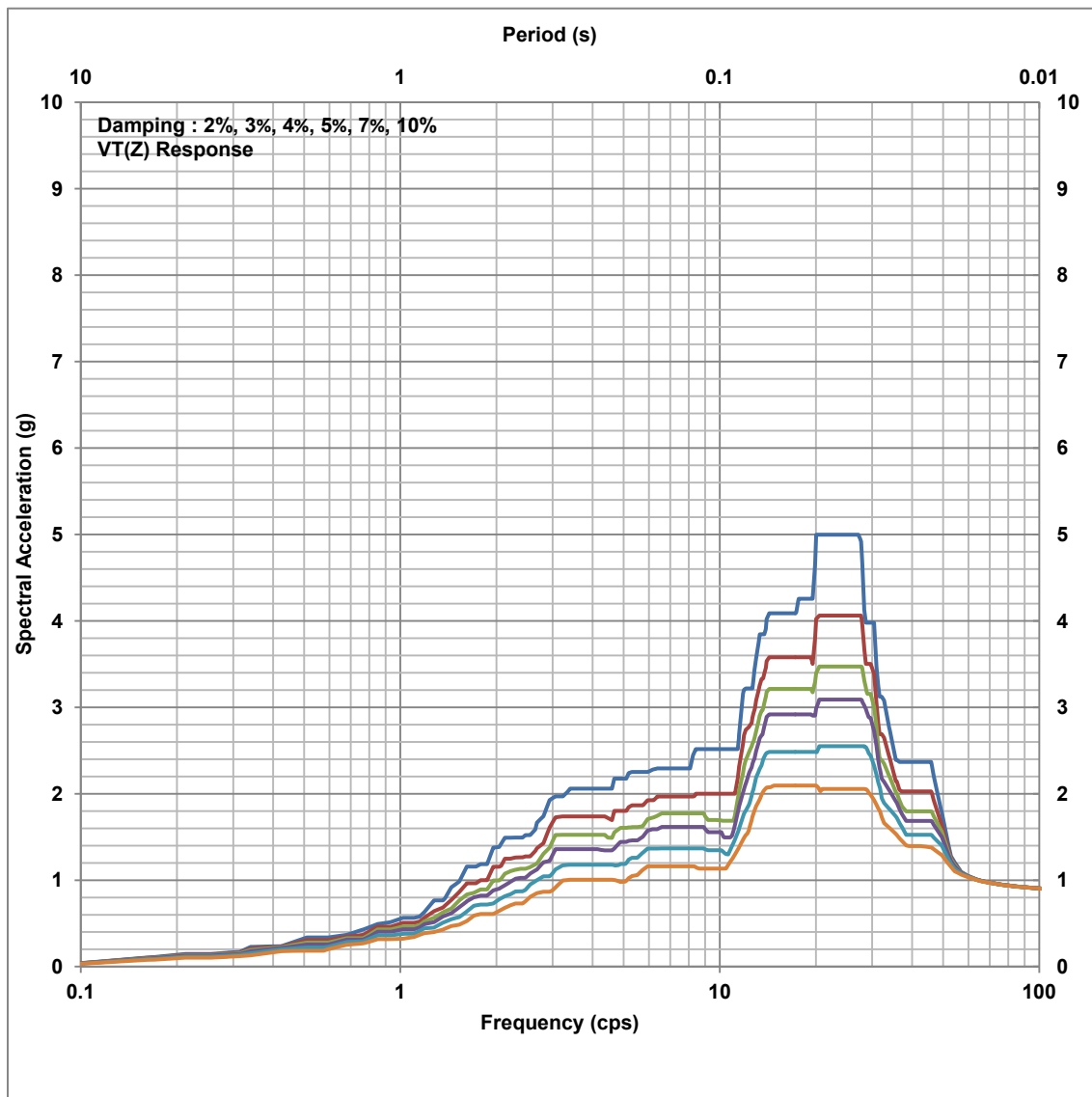


Figure 3.7A-26 Enveloped ISRS for SSE, Reactor Containment Building PSW at EL.191'-0" (General), Vertical, Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

APR1400 DCD TIER 2

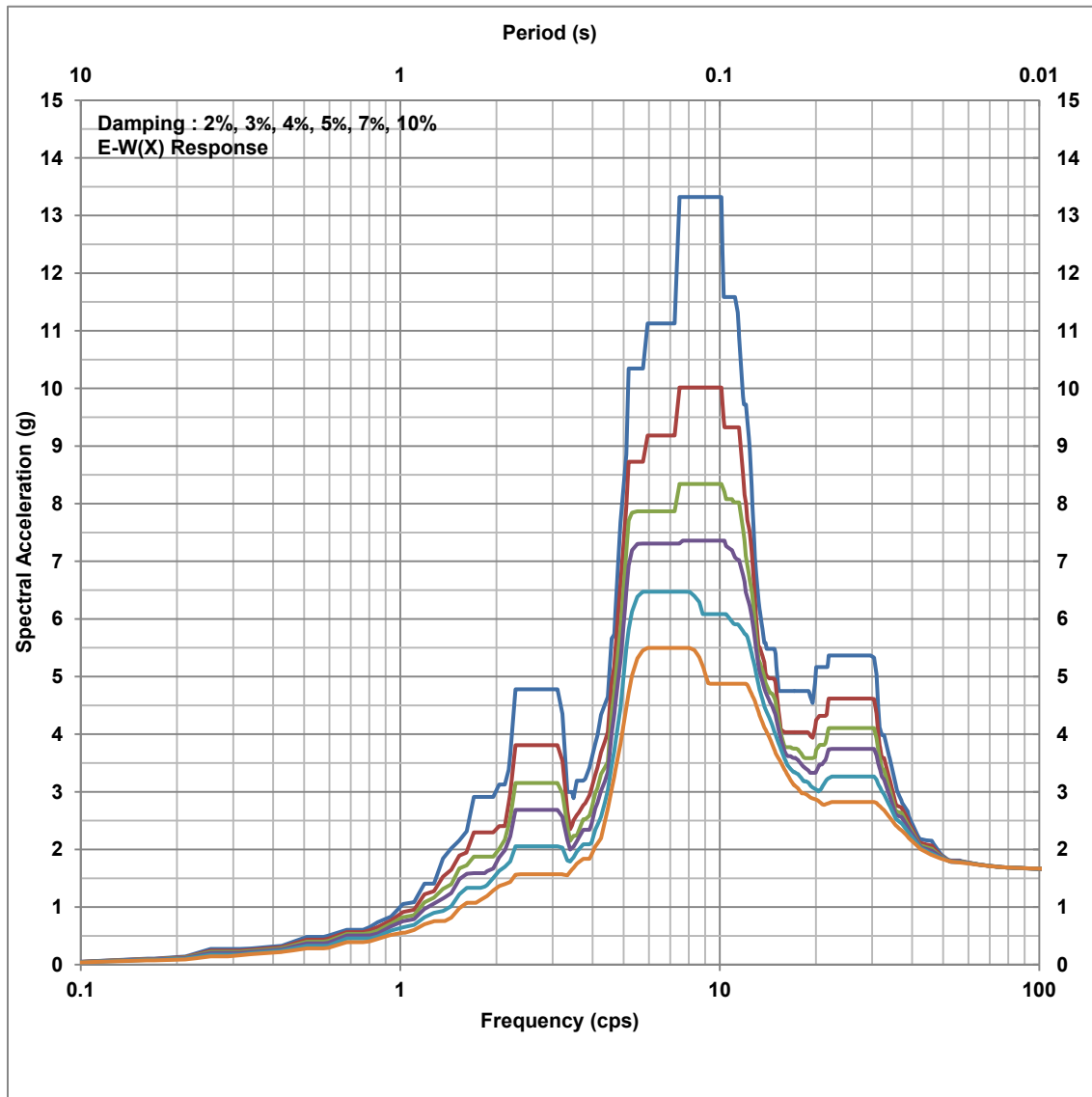


Figure 3.7A-27 Enveloped ISRS for SSE, Reactor Containment Building PSW at EL.191'-0" (Pressurizer Corners), E-W, Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

APR1400 DCD TIER 2

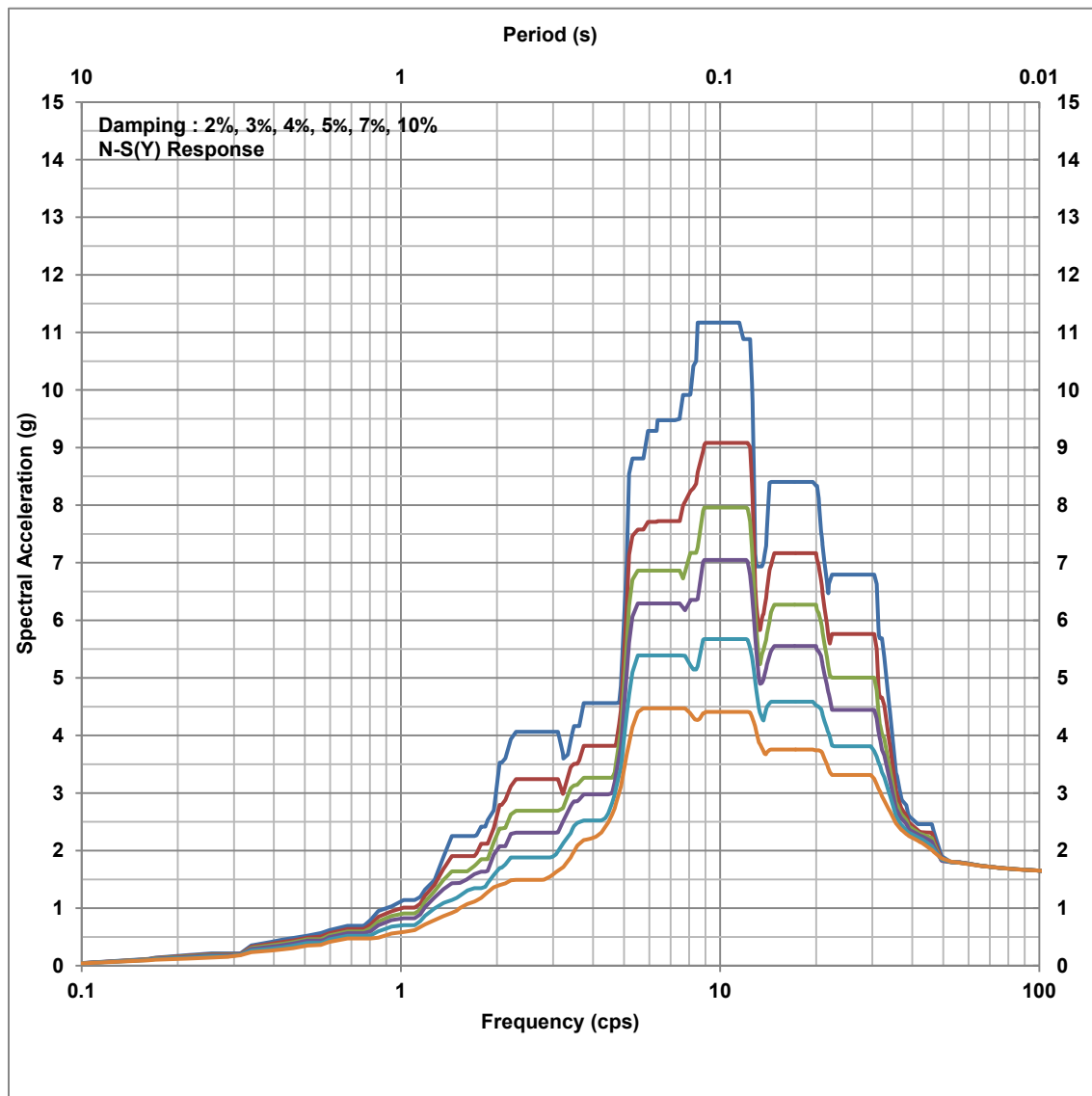


Figure 3.7A-28 Enveloped ISRS for SSE, Reactor Containment Building PSW at EL.191'-0" (Pressurizer Corners), N-S, Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

APR1400 DCD TIER 2

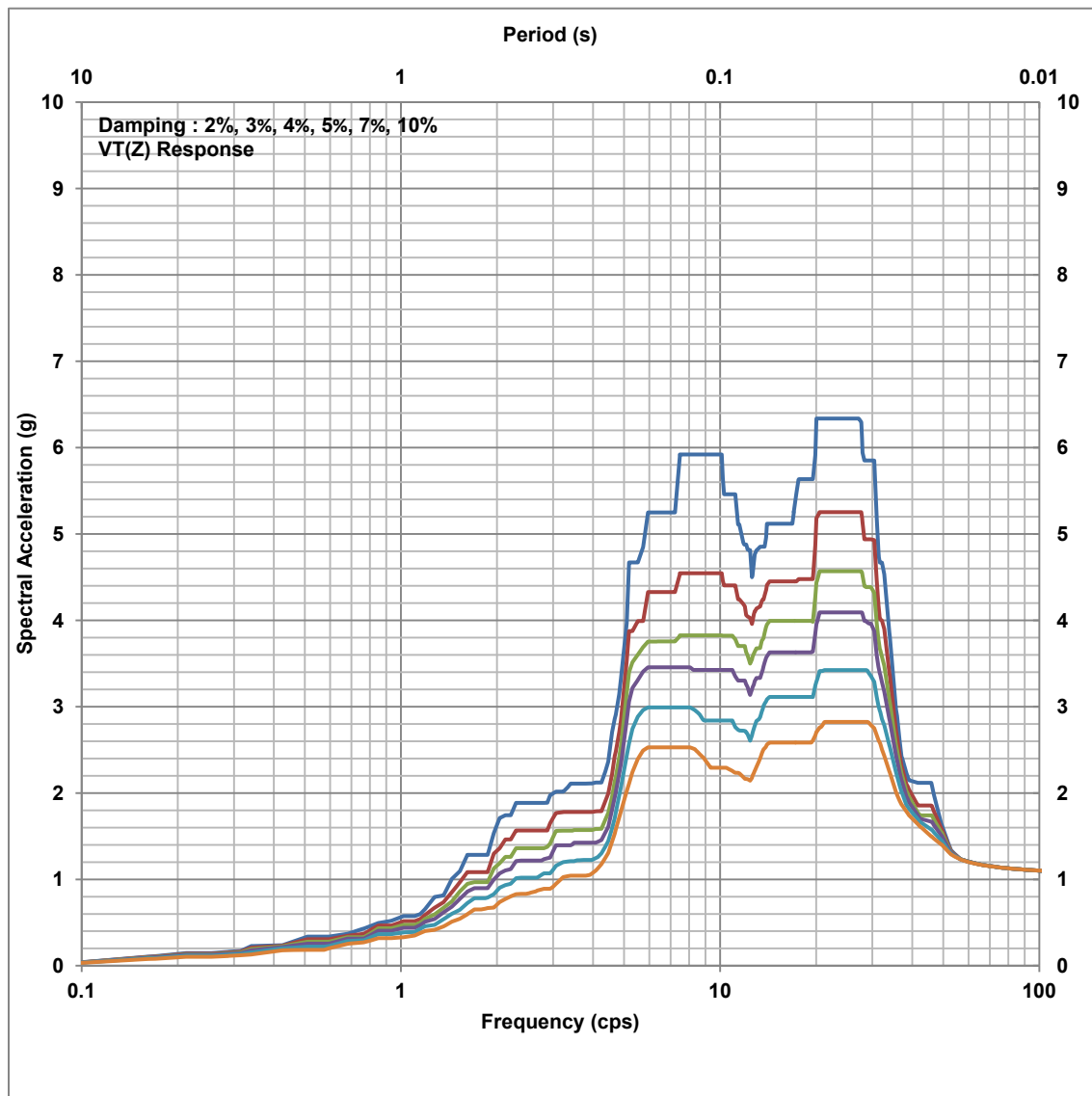


Figure 3.7A-29 Enveloped ISRS for SSE, Reactor Containment Building PSW at EL.191'-0" (Pressurizer Corners), Vertical, Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

APR1400 DCD TIER 2

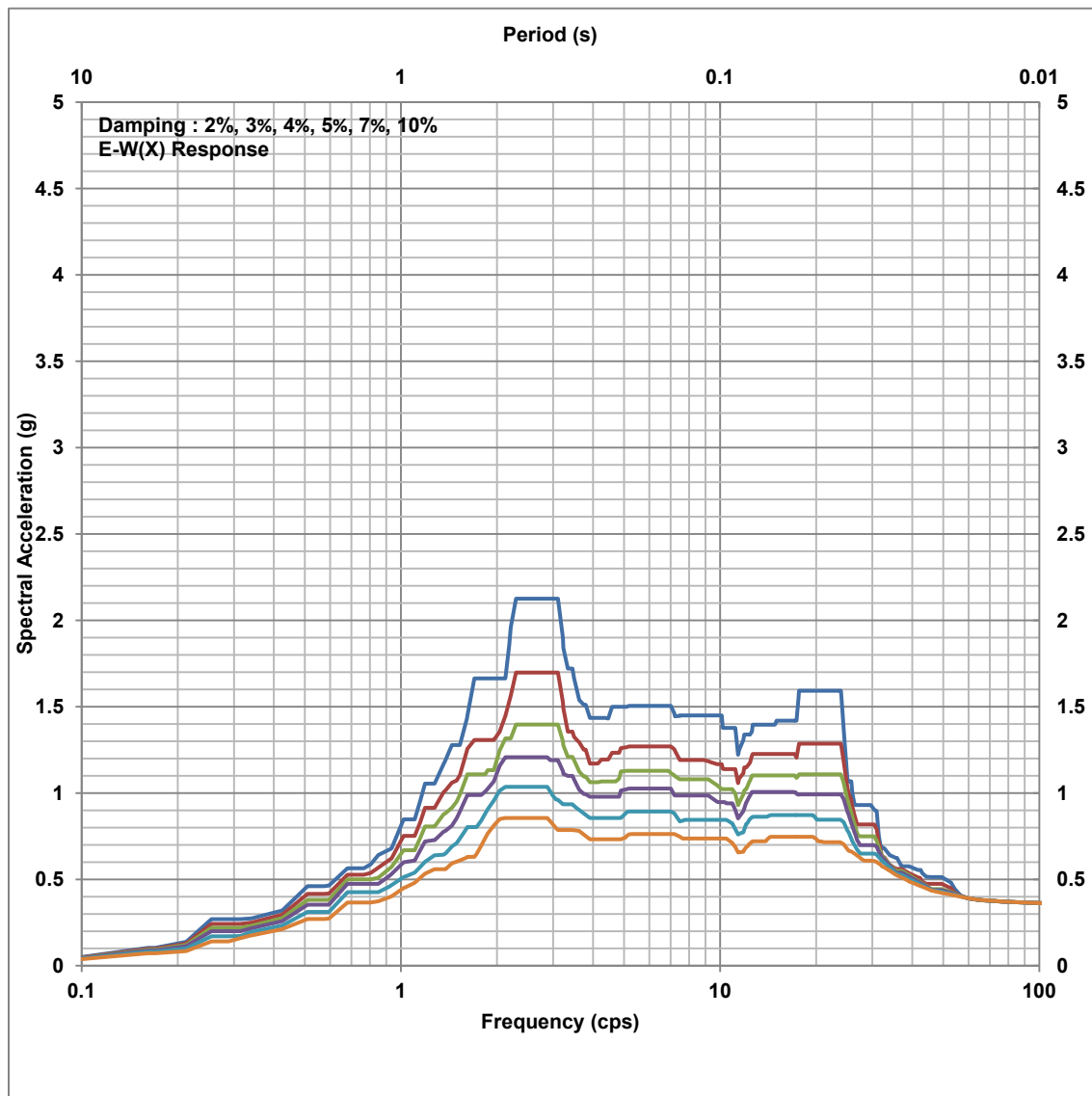


Figure 3.7A-30 Enveloped ISRS for SSE, Reactor Containment Building SSW at EL.78'-0", E-W, Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

APR1400 DCD TIER 2

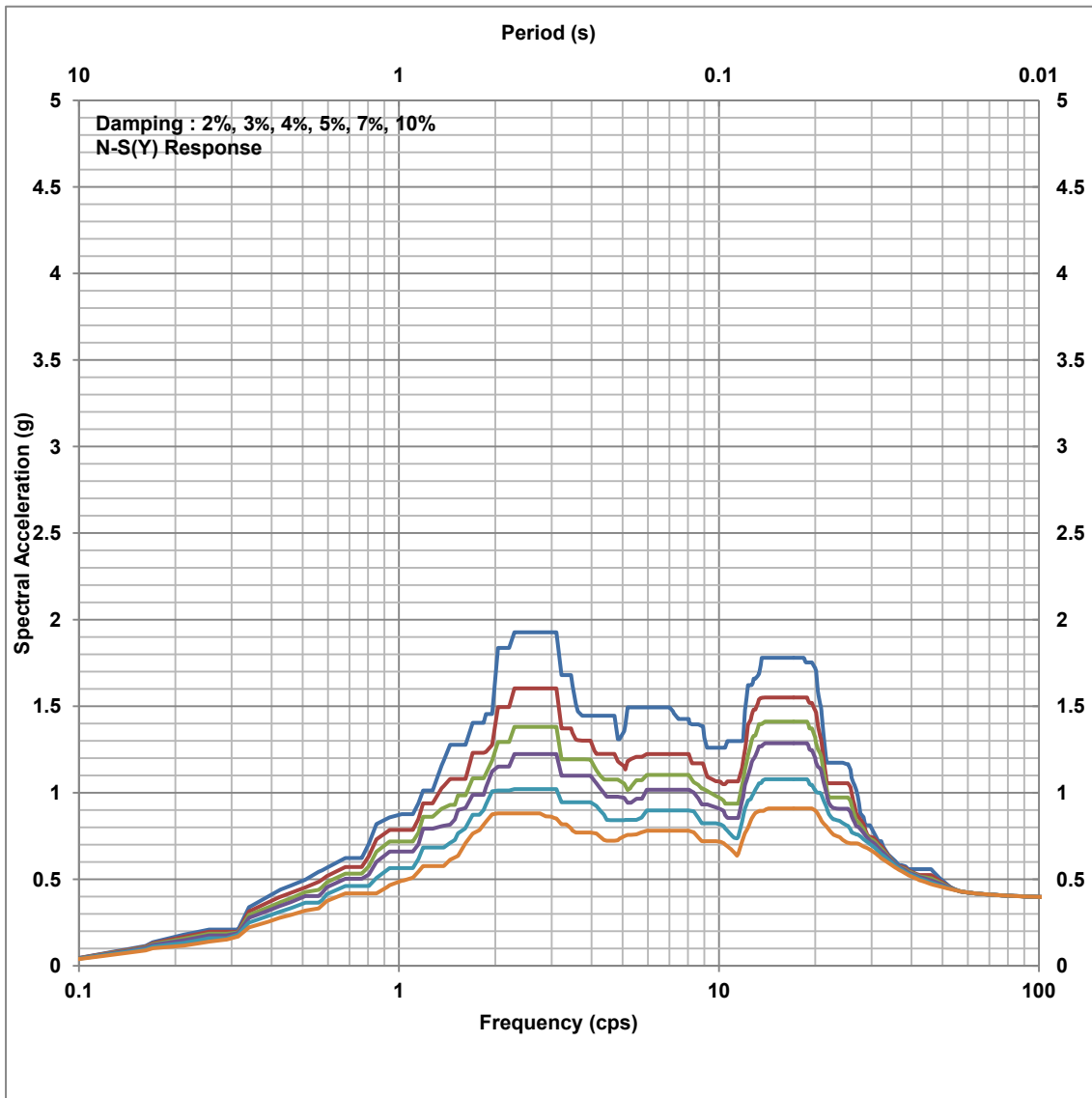


Figure 3.7A-31 Enveloped ISRS for SSE, Reactor Containment Building SSW
at EL.78'-0", N-S, Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

APR1400 DCD TIER 2

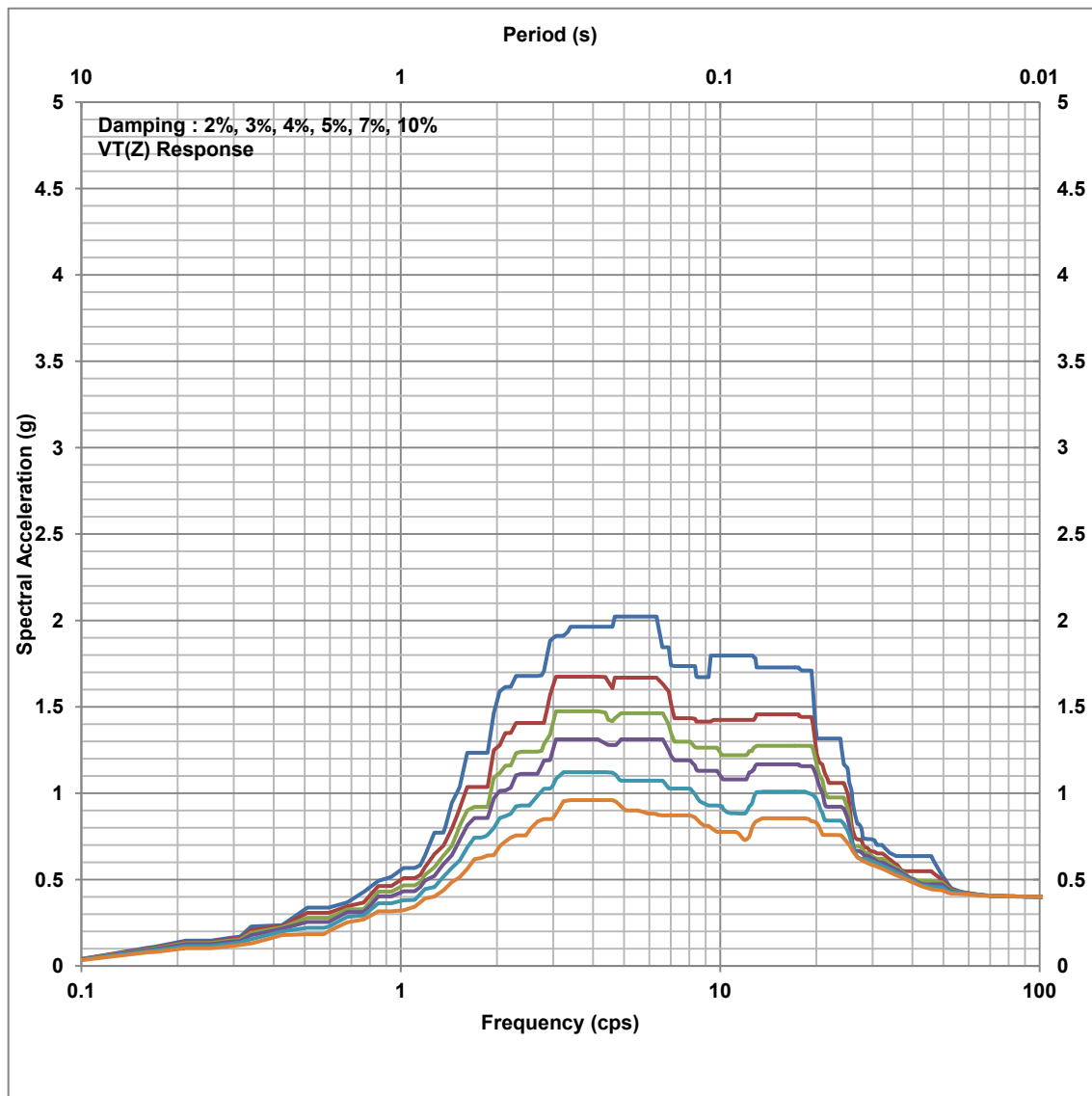


Figure 3.7A-32 Enveloped ISRS for SSE, Reactor Containment Building SSW at EL.78'-0", Vertical, Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

APR1400 DCD TIER 2

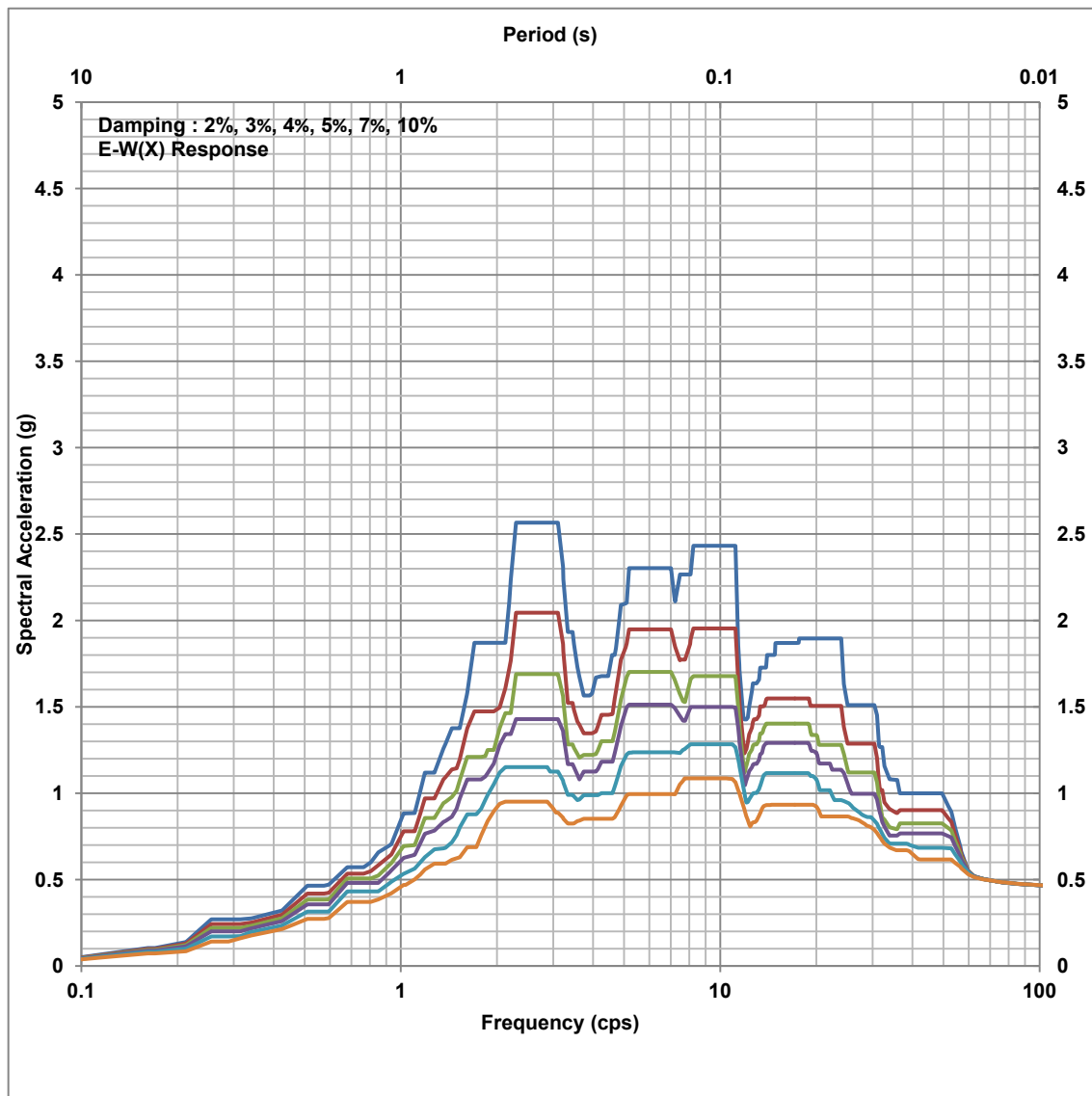


Figure 3.7A-33 Enveloped ISRS for SSE, Reactor Containment Building SSW at EL.100'-0" (General), E-W, Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

APR1400 DCD TIER 2

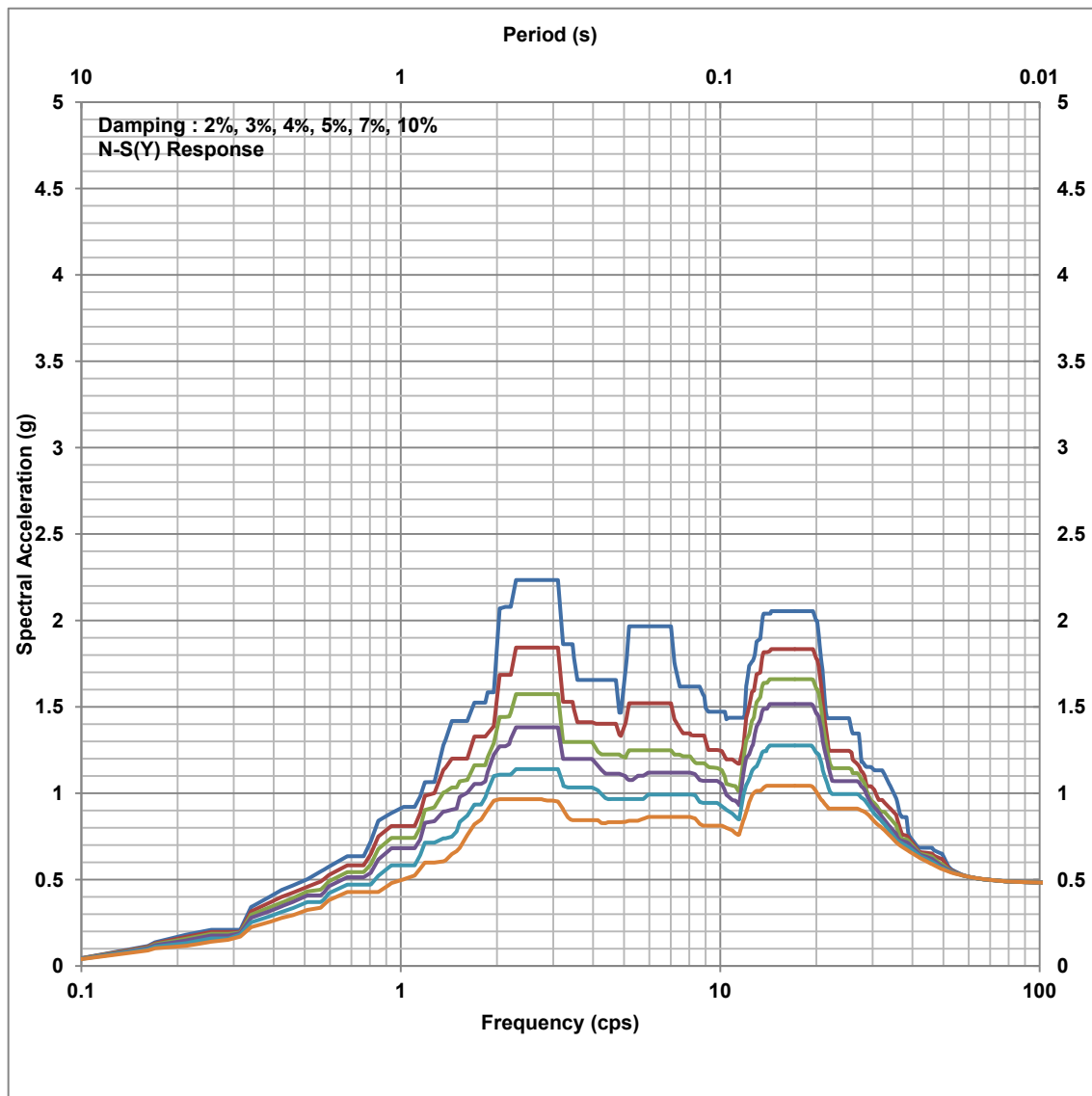


Figure 3.7A-34 Enveloped ISRS for SSE, Reactor Containment Building SSW at EL.100'-0" (General), N-S, Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

APR1400 DCD TIER 2

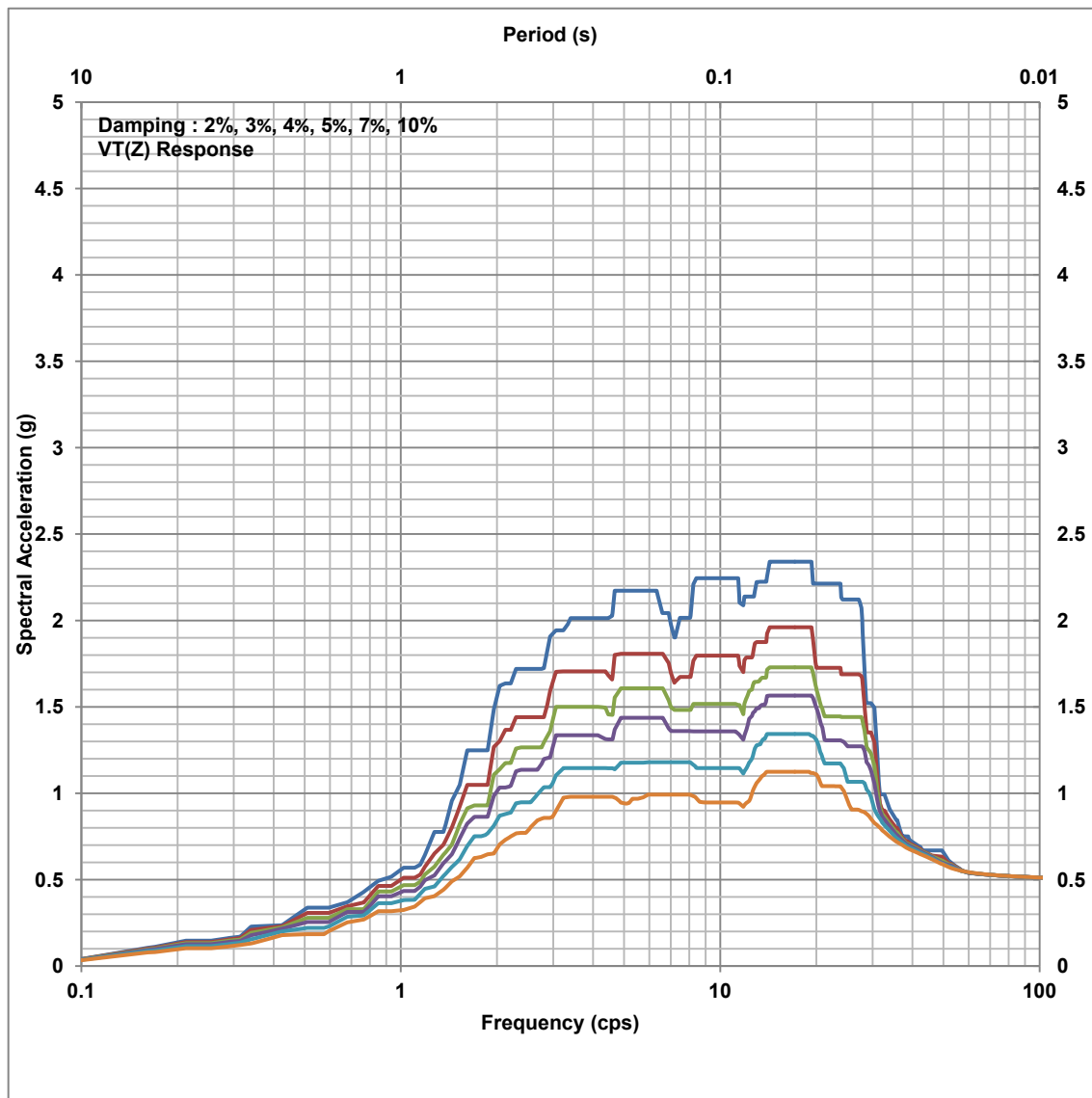


Figure 3.7A-35 Enveloped ISRS for SSE, Reactor Containment Building SSW at EL.100'-0" (General), Vertical, Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

APR1400 DCD TIER 2

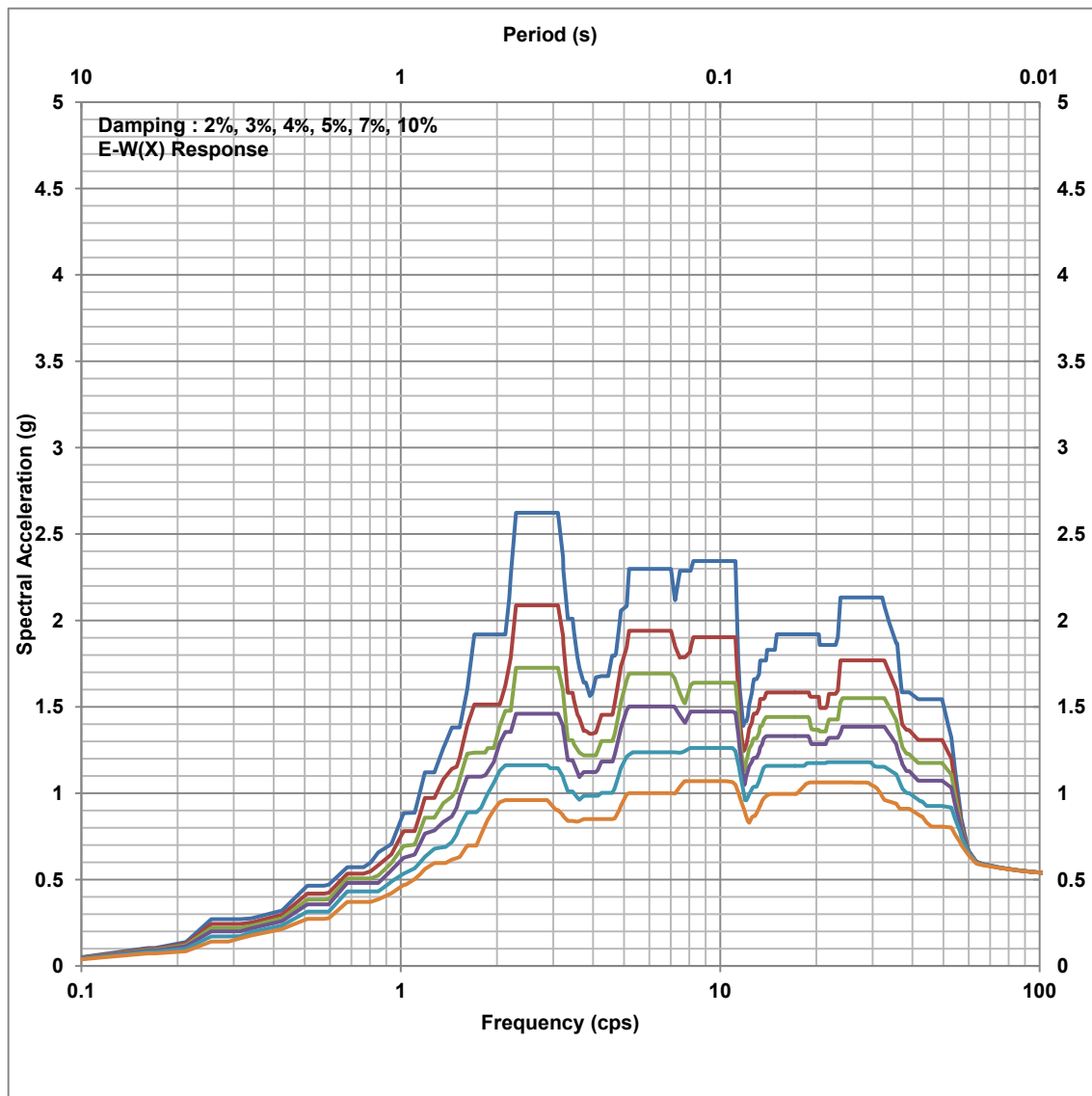


Figure 3.7A-36 Enveloped ISRS for SSE, Reactor Containment Building SSW at EL.100'-0" (IRWST Walls), E-W, Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

APR1400 DCD TIER 2

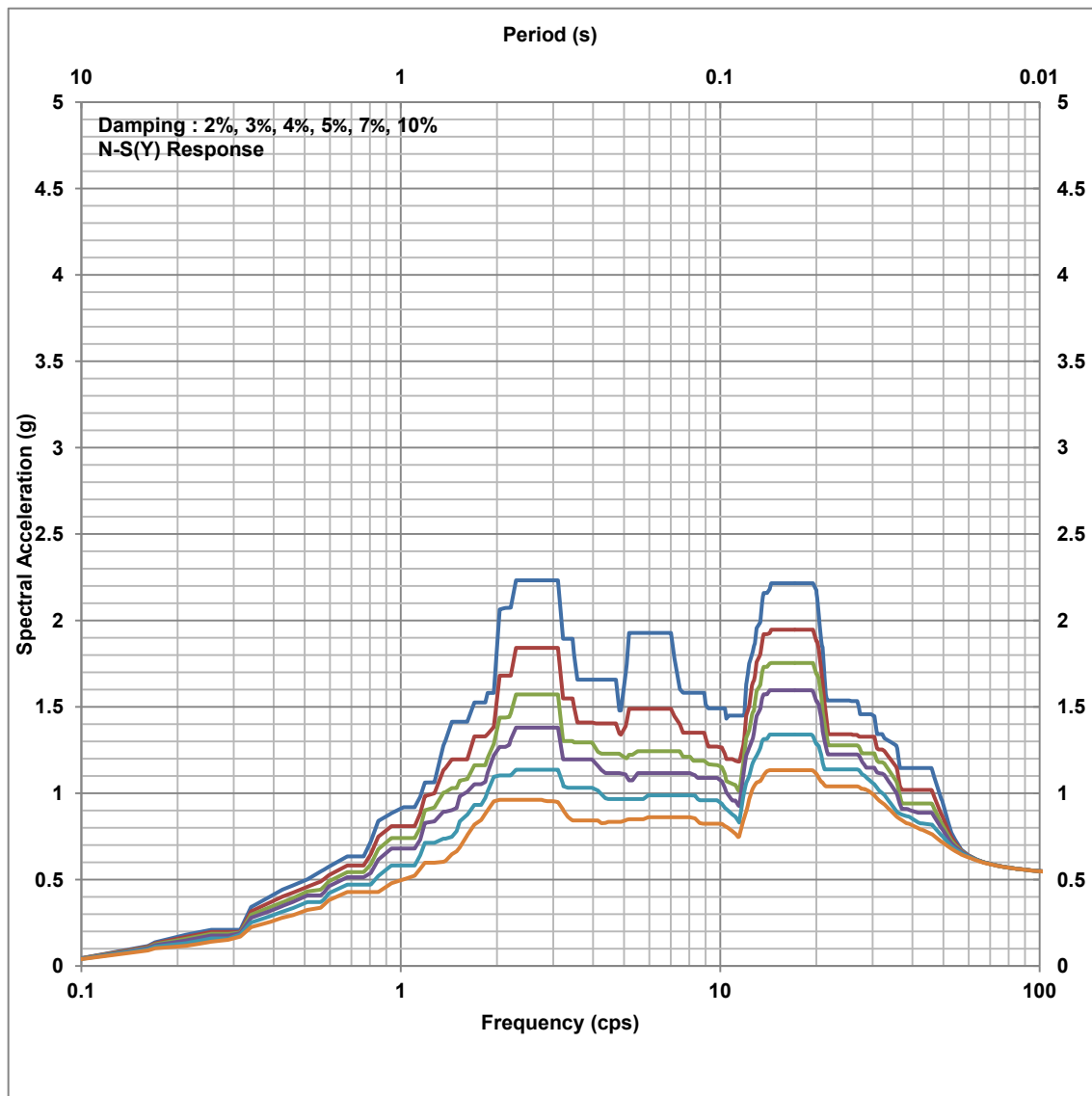


Figure 3.7A-37 Enveloped ISRS for SSE, Reactor Containment Building SSW at EL.100'-0" (IRWST Walls), N-S, Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

APR1400 DCD TIER 2

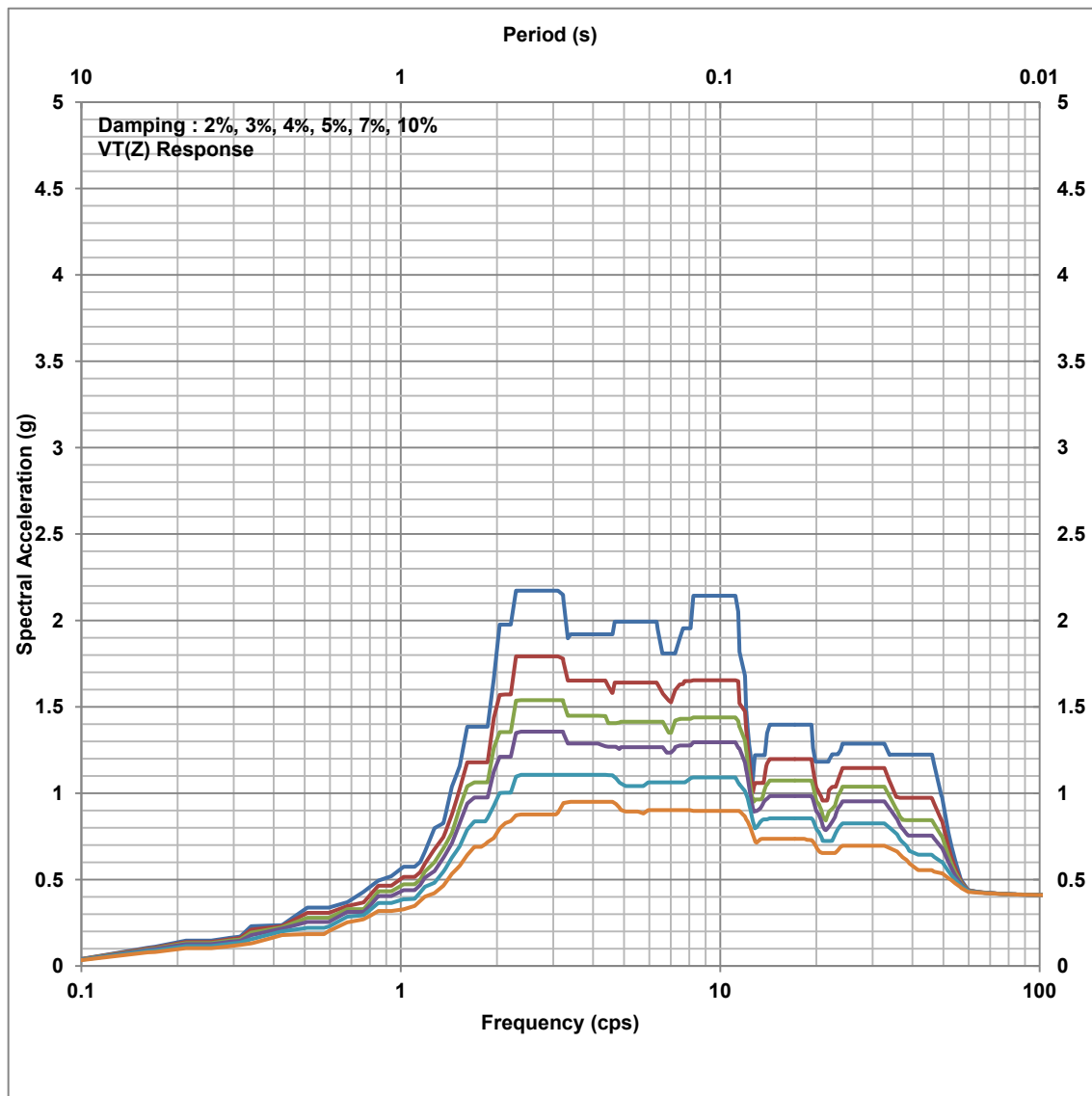


Figure 3.7A-38 Enveloped ISRS for SSE, Reactor Containment Building SSW at EL.100'-0" (IRWST Walls), Vertical, Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

APR1400 DCD TIER 2

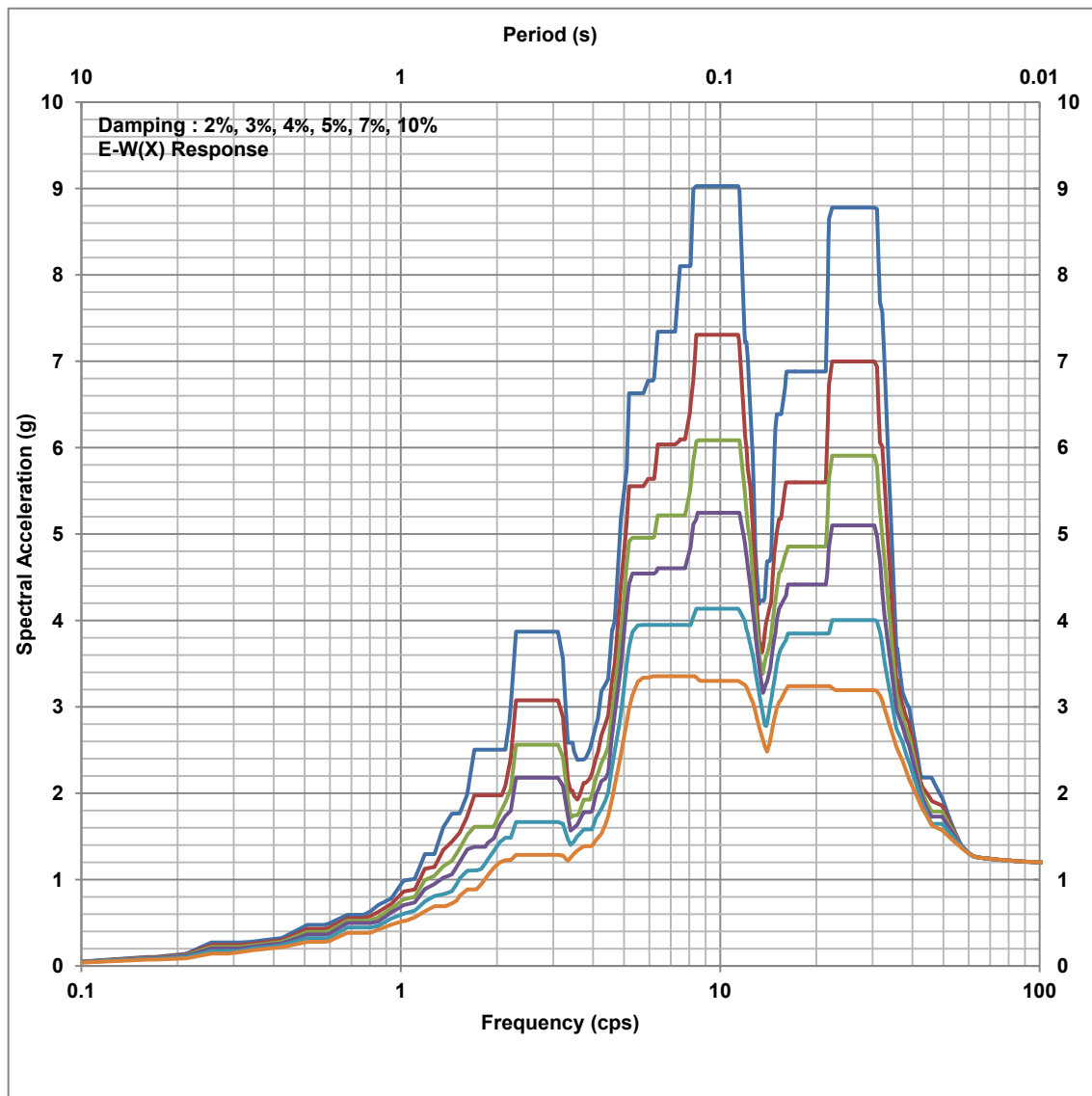


Figure 3.7A-39 Enveloped ISRS for SSE, Reactor Containment Building SSW at EL.156'-0", E-W, Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

APR1400 DCD TIER 2

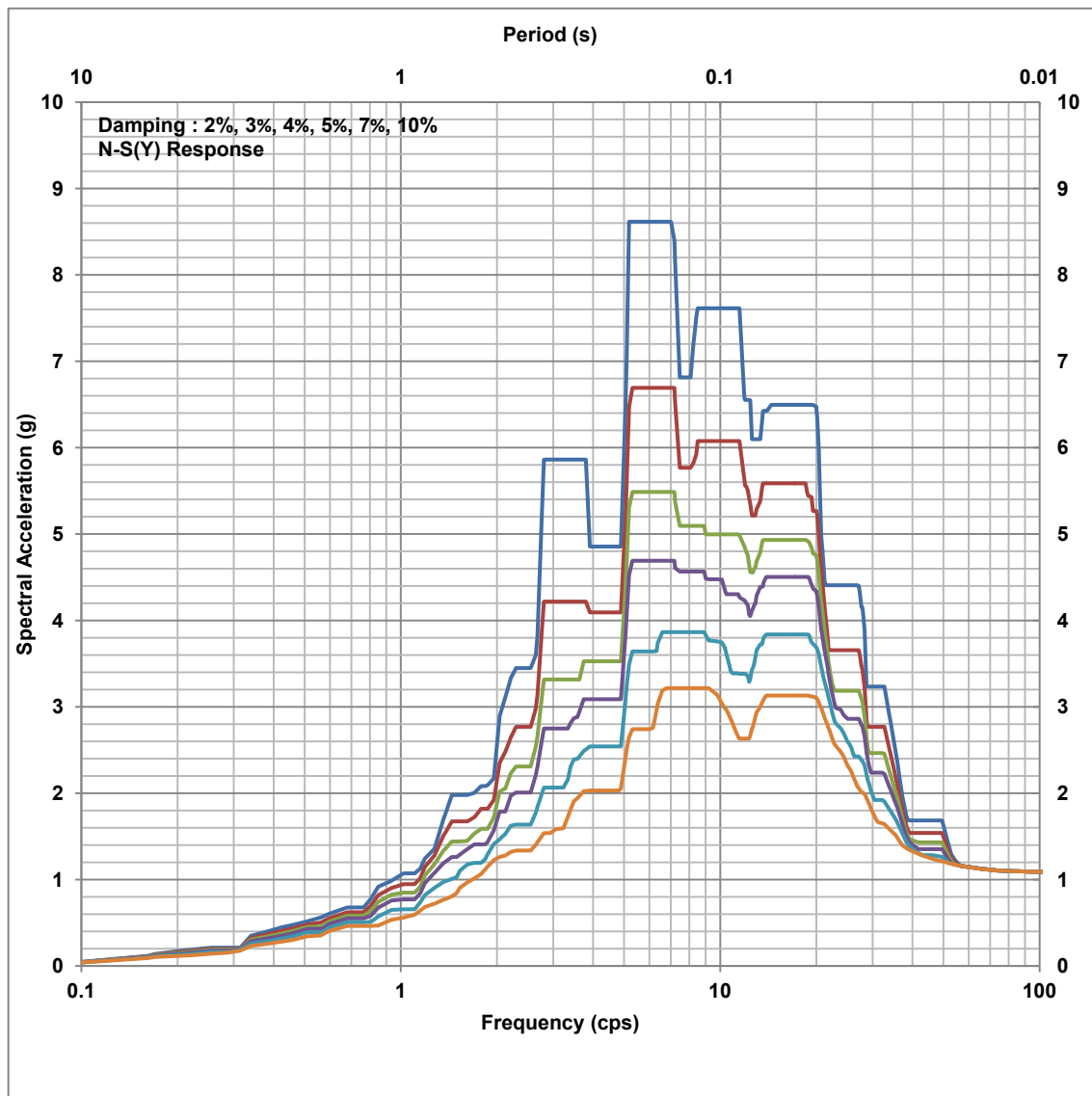


Figure 3.7A-40 Enveloped ISRS for SSE, Reactor Containment Building SSW at EL.156'-0", N-S, Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

APR1400 DCD TIER 2

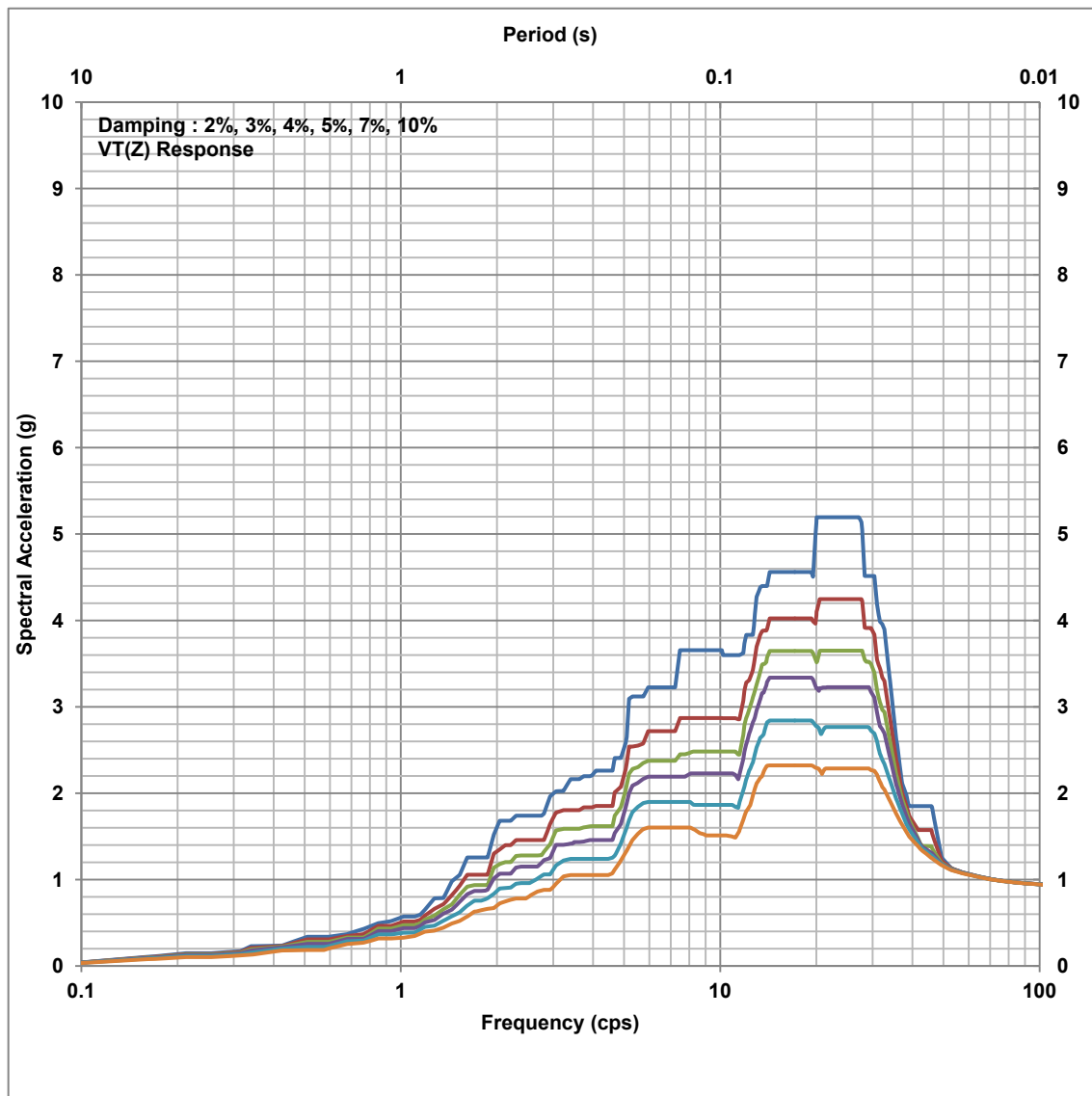


Figure 3.7A-41 Enveloped ISRS for SSE, Reactor Containment Building SSW at EL.156'-0", Vertical, Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

APR1400 DCD TIER 2

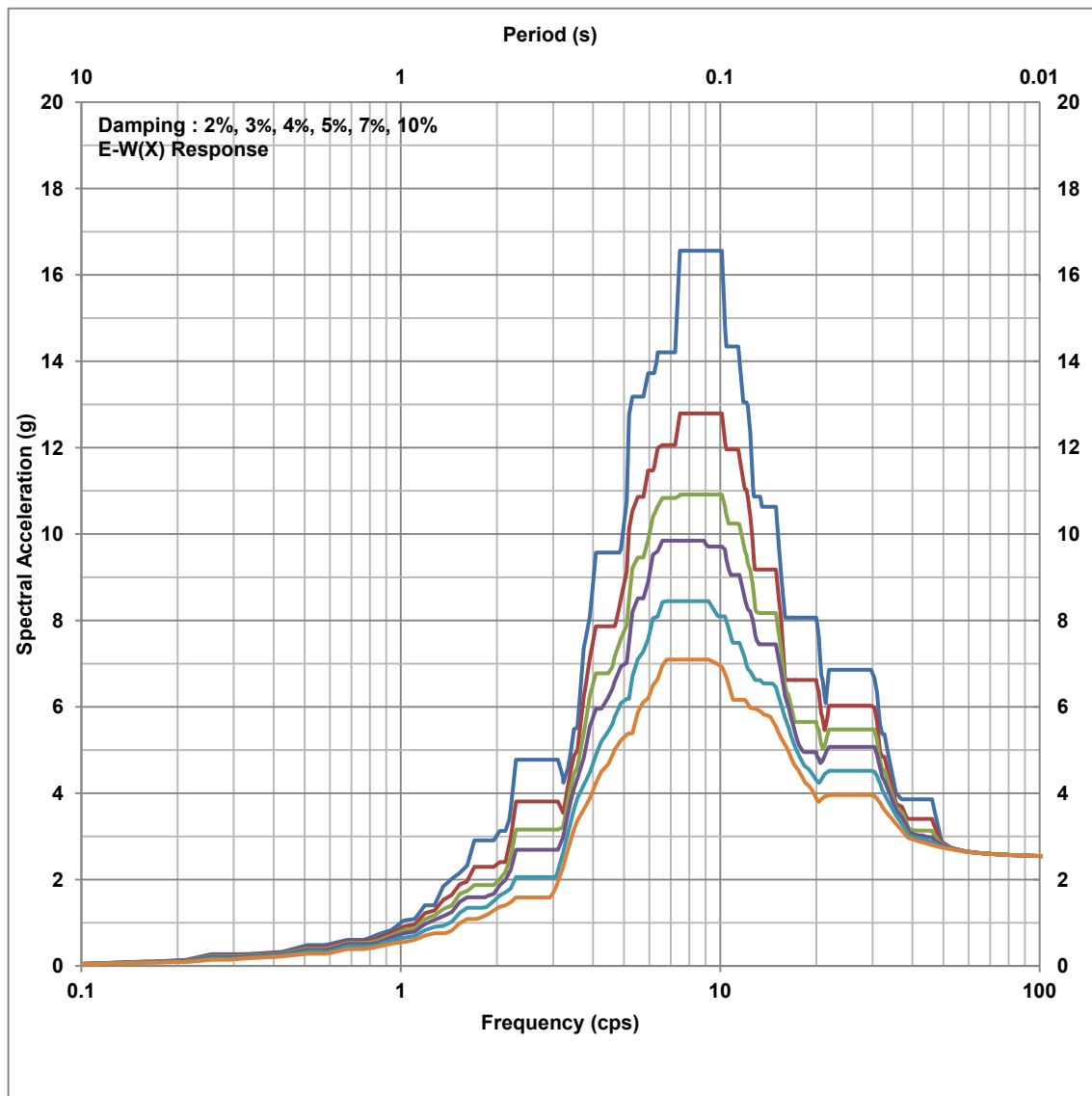


Figure 3.7A-42 Enveloped ISRS for SSE, Reactor Containment Building SSW at EL.191'-0", E-W, Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

APR1400 DCD TIER 2

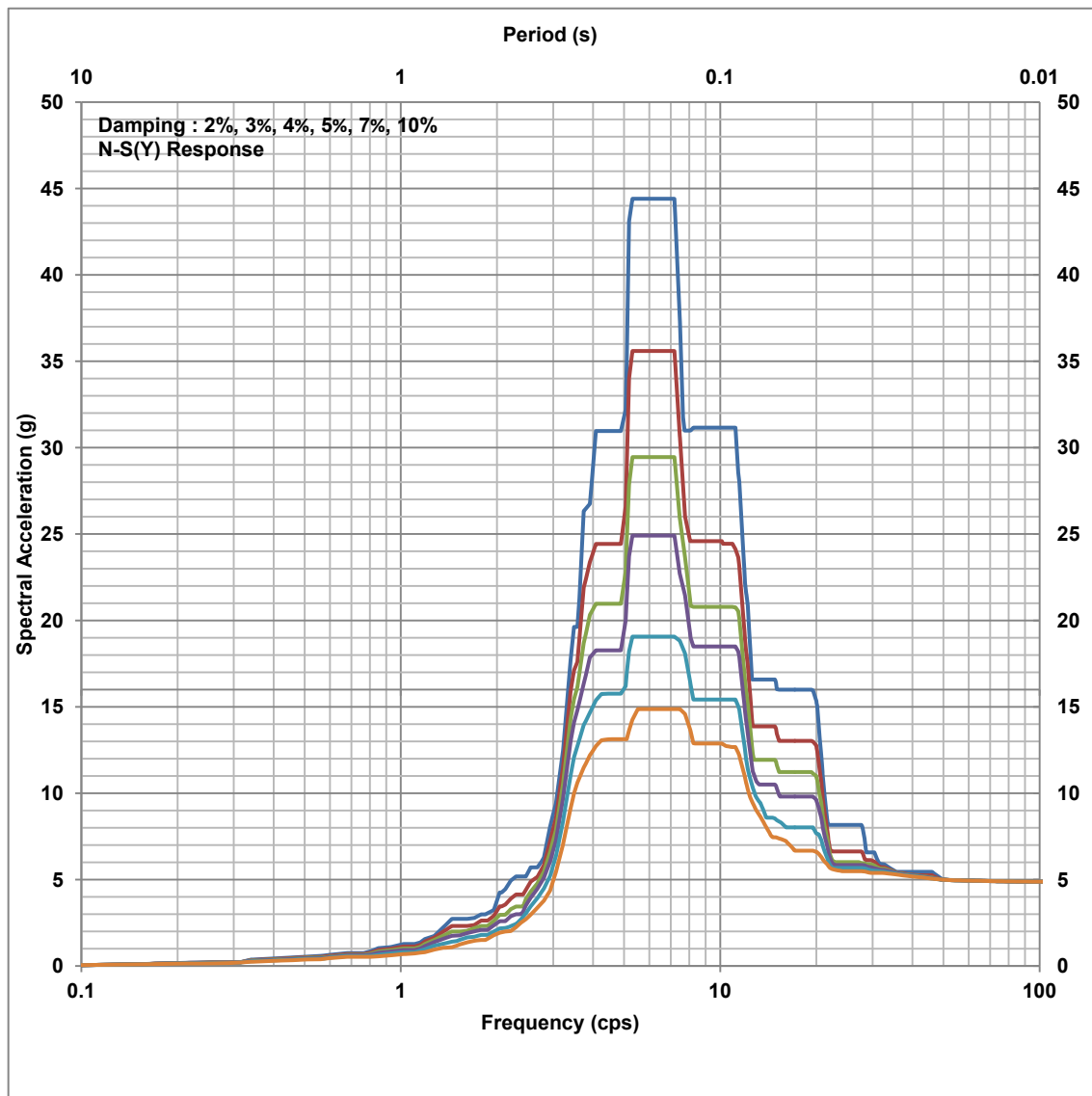


Figure 3.7A-43 Enveloped ISRS for SSE, Reactor Containment Building SSW at EL.191'-0", N-S, Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

APR1400 DCD TIER 2

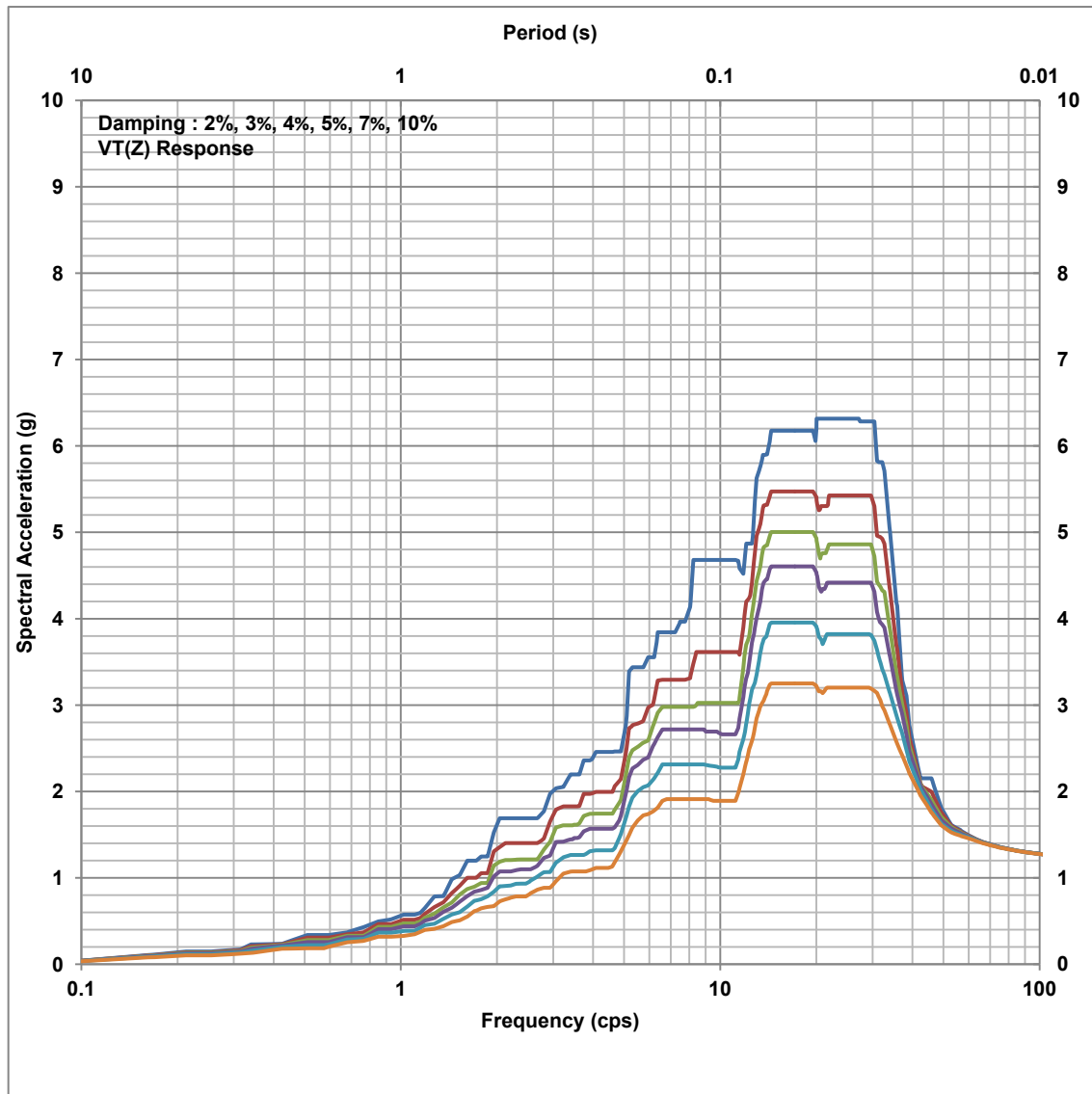


Figure 3.7A-44 Enveloped ISRS for SSE, Reactor Containment Building SSW at EL.191'-0", Vertical, Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

APR1400 DCD TIER 2

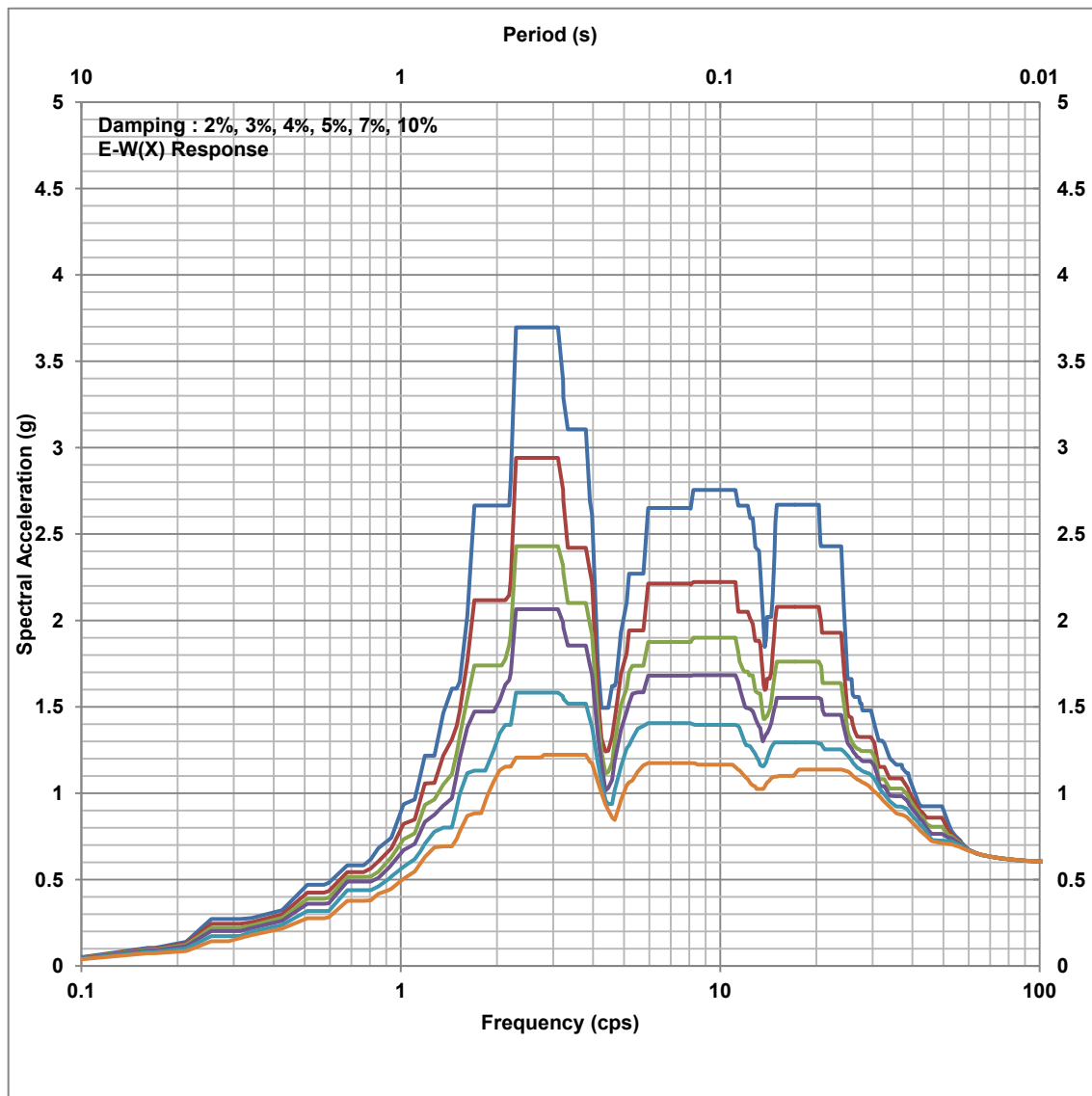


Figure 3.7A-45 Enveloped ISRS for SSE, Reactor Containment Building
Containment Structure at EL.104'-0", E-W, Damping Ratio 2%, 3%,
4%, 5%, 7%, 10%

APR1400 DCD TIER 2

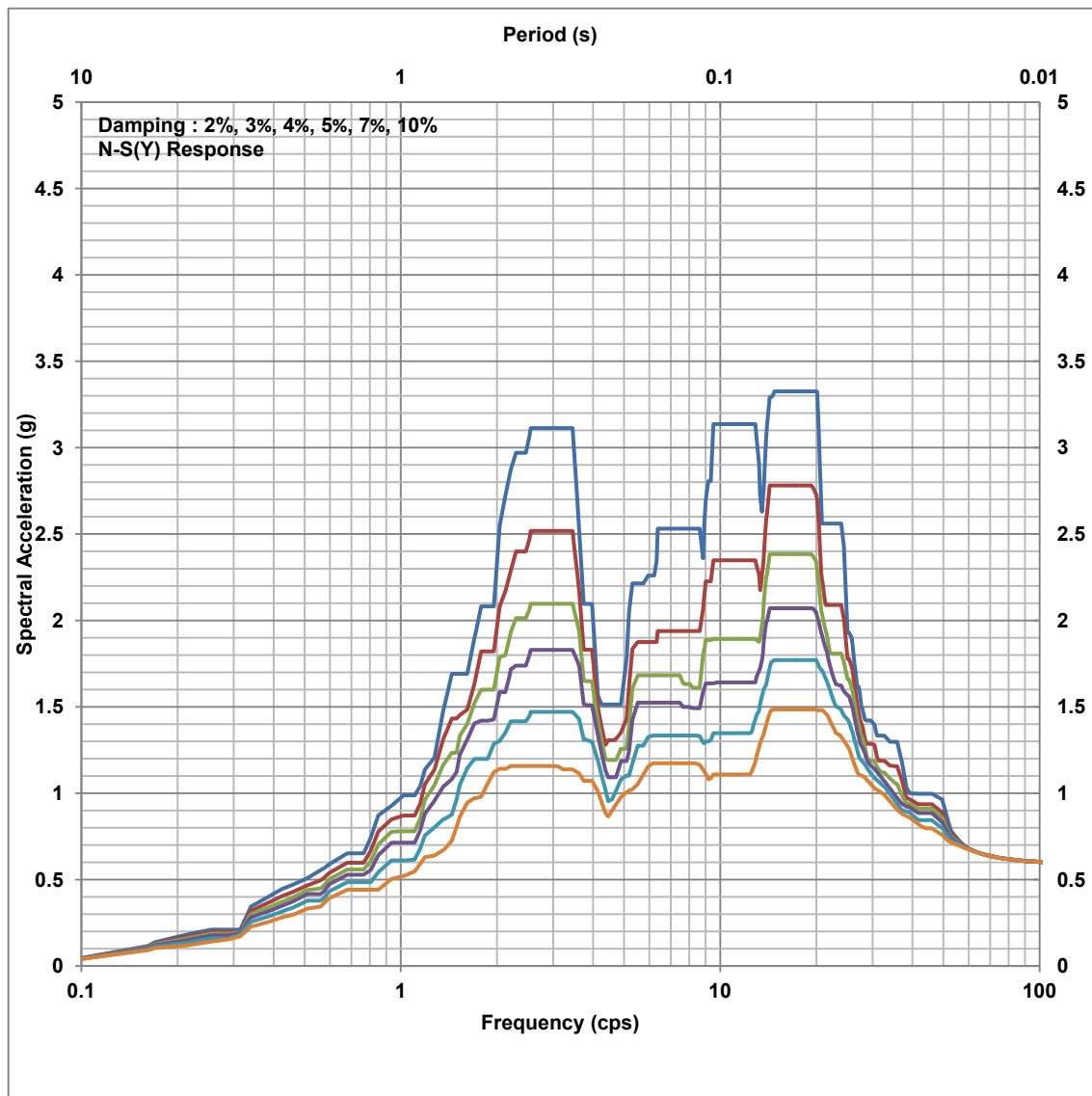


Figure 3.7A-46 Enveloped ISRS for SSE, Reactor Containment Building
Containment Structure at EL.104'-0", N-S, Damping Ratio 2%, 3%,
4%, 5%, 7%, 10%

APR1400 DCD TIER 2

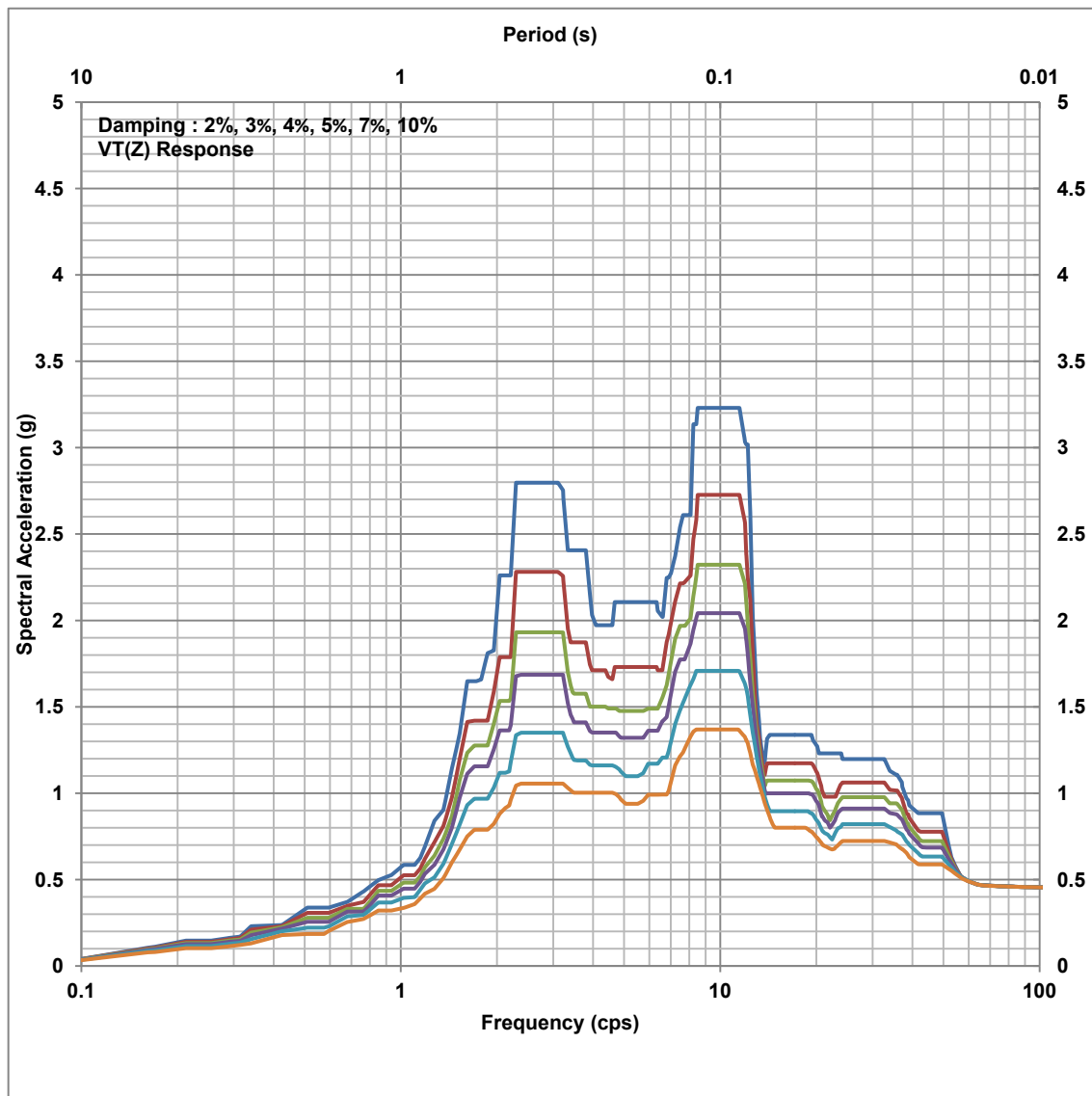


Figure 3.7A-47 Enveloped ISRS for SSE, Reactor Containment Building
Containment Structure at EL.104'-0", Vertical, Damping Ratio 2%,
3%, 4%, 5%, 7%, 10%

APR1400 DCD TIER 2

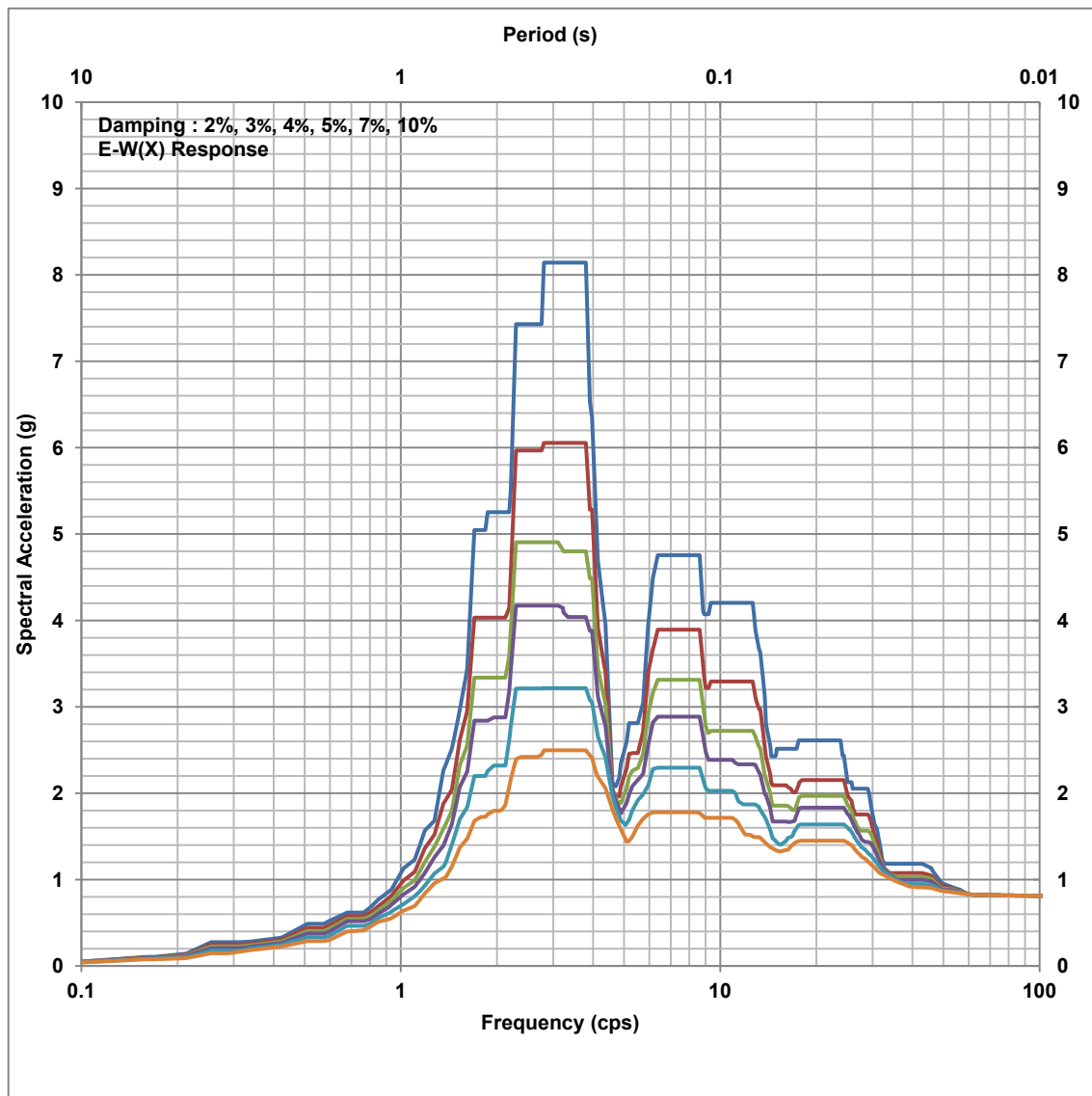


Figure 3.7A-48 Enveloped ISRS for SSE, Reactor Containment Building
Containment Structure at EL.160'-0", E-W, Damping Ratio 2%, 3%,
4%, 5%, 7%, 10%

APR1400 DCD TIER 2

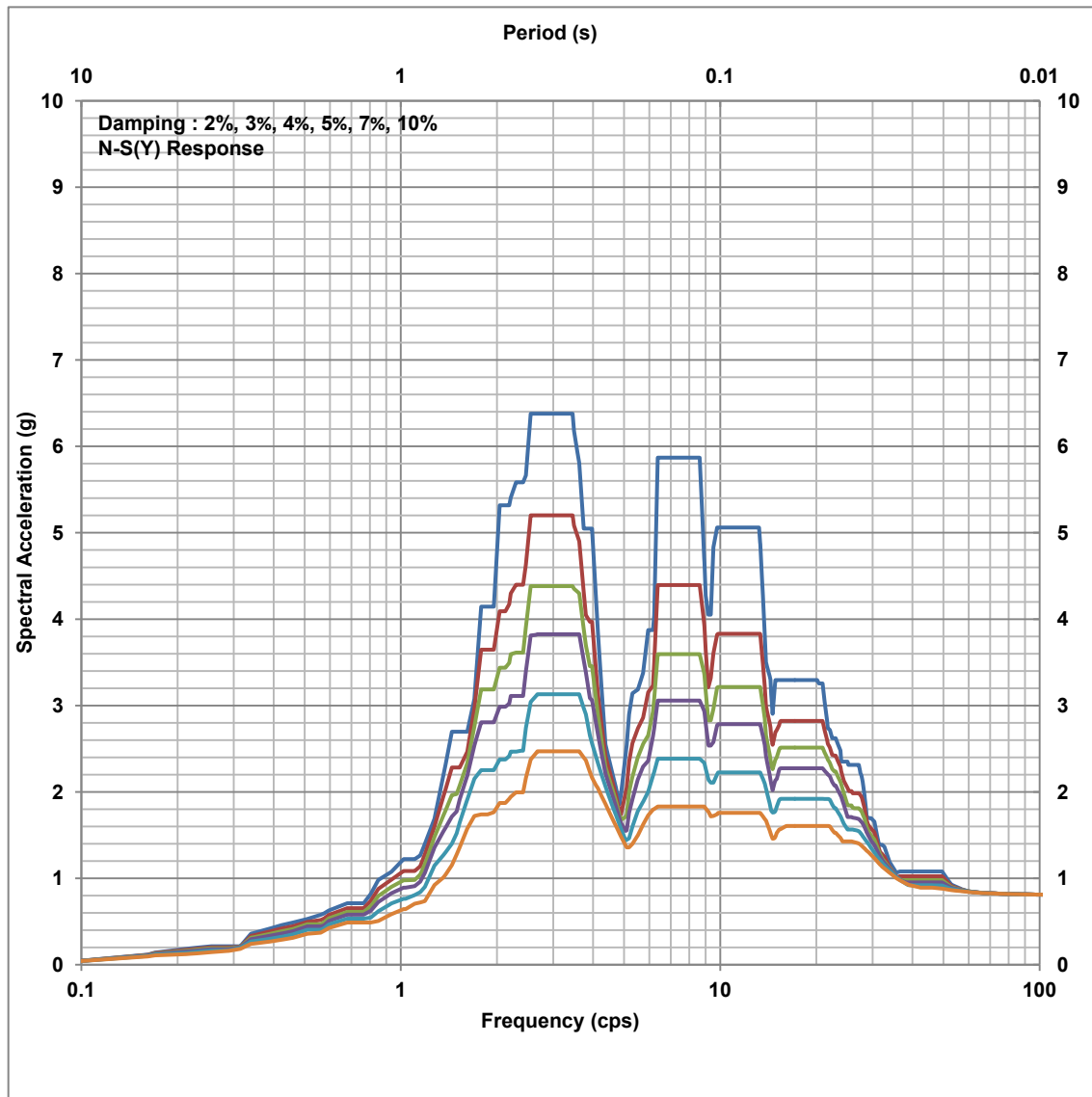


Figure 3.7A-49 Enveloped ISRS for SSE, Reactor Containment Building
Containment Structure at EL.160'-0", N-S, Damping Ratio 2%, 3%,
4%, 5%, 7%, 10%

APR1400 DCD TIER 2

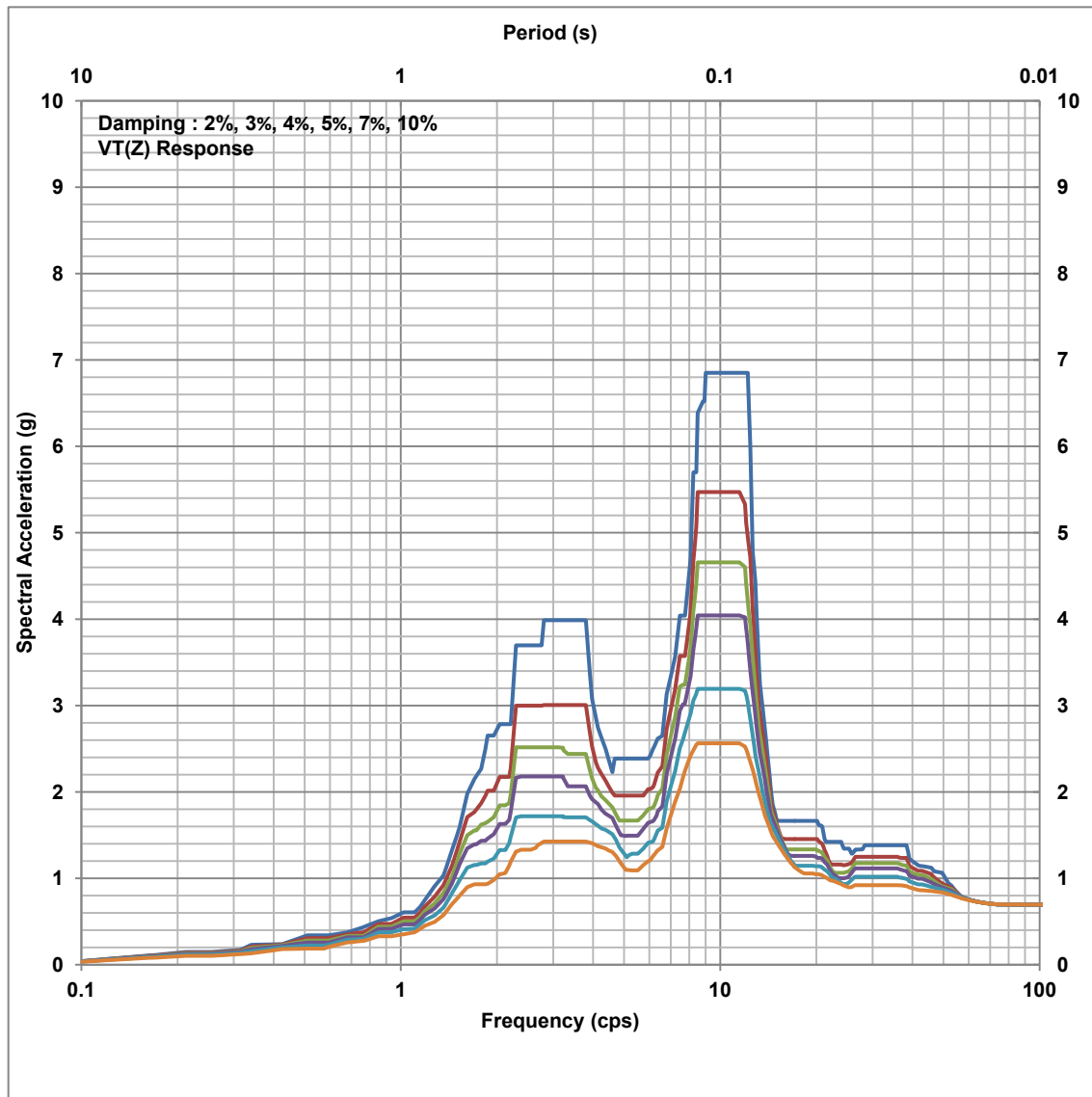


Figure 3.7A-50 Enveloped ISRS for SSE, Reactor Containment Building
Containment Structure at EL.160'-0", Vertical, Damping Ratio 2%,
3%, 4%, 5%, 7%, 10%

APR1400 DCD TIER 2

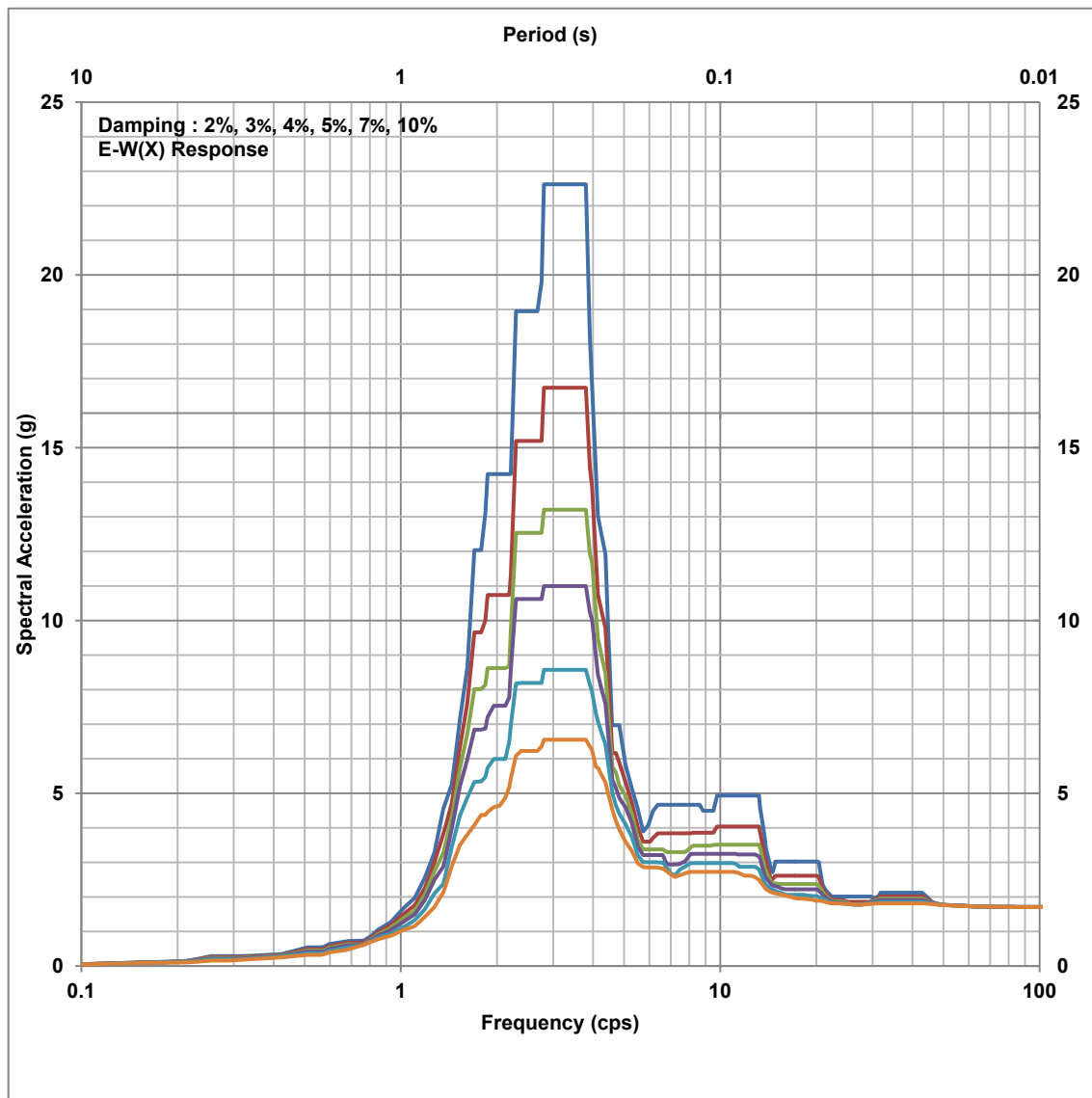


Figure 3.7A-51 Enveloped ISRS for SSE, Reactor Containment Building
Containment Structure at EL.332'-0", E-W, Damping Ratio 2%, 3%,
4%, 5%, 7%, 10%

APR1400 DCD TIER 2

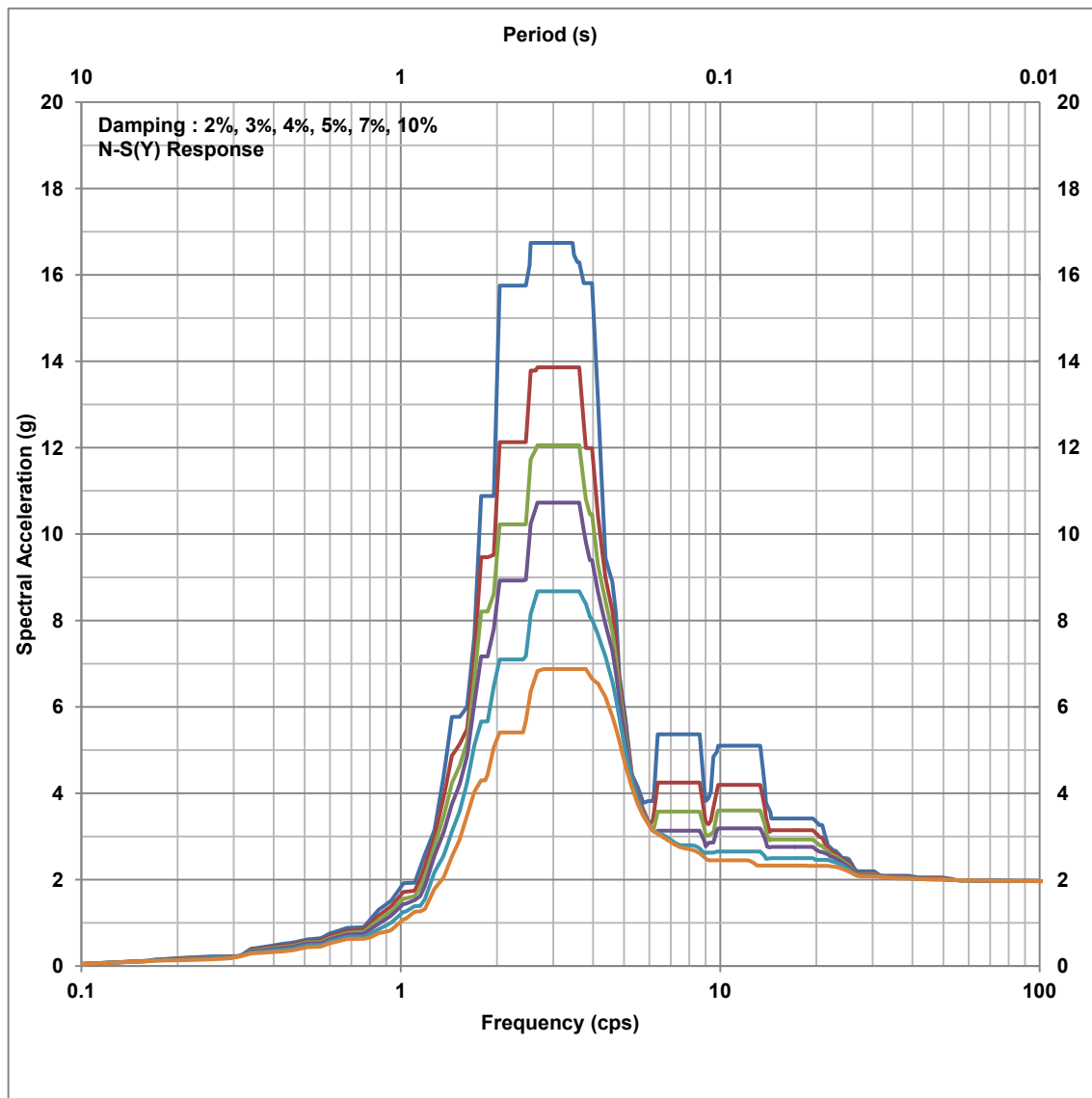


Figure 3.7A-52 Enveloped ISRS for SSE, Reactor Containment Building
Containment Structure at EL.332'-0", N-S, Damping Ratio 2%, 3%,
4%, 5%, 7%, 10%

APR1400 DCD TIER 2

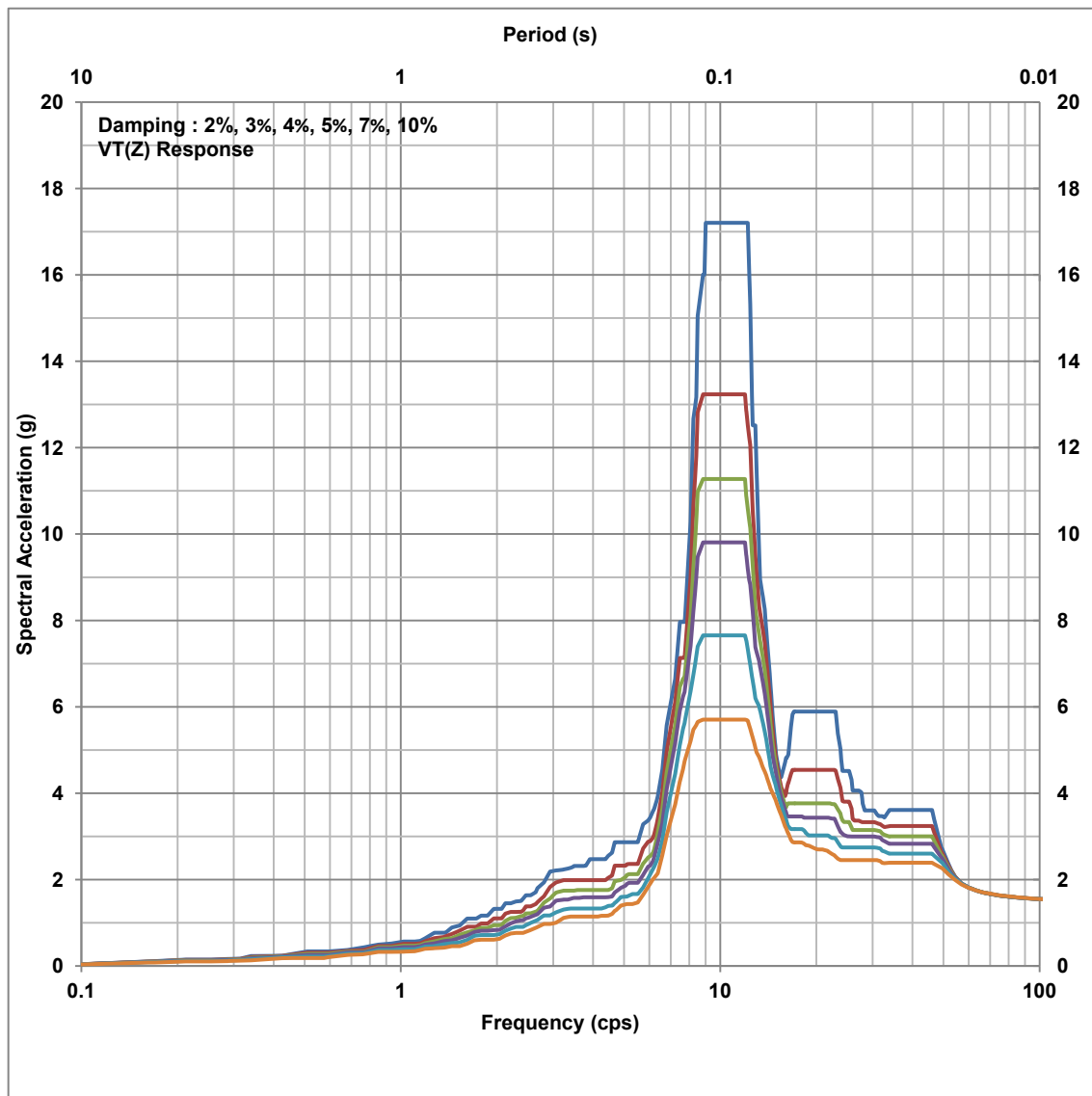


Figure 3.7A-53 Enveloped ISRS for SSE, Reactor Containment Building
Containment Structure at EL.332'-0", Vertical, Damping Ratio 2%,
3%, 4%, 5%, 7%, 10%

APR1400 DCD TIER 2

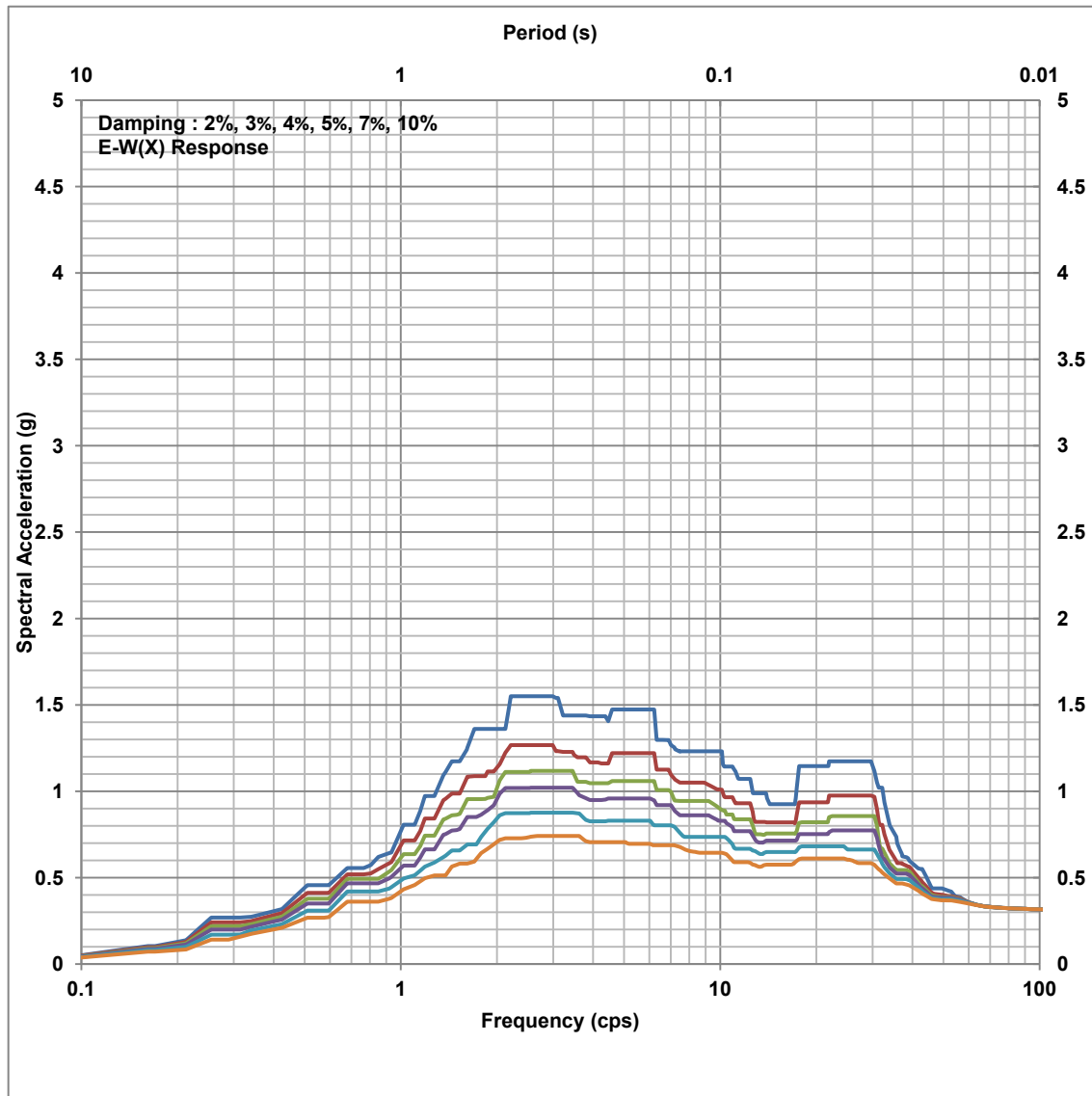


Figure 3.7A-54 Enveloped ISRS for SSE, Auxiliary Building at EL.55'-0", E-W,
Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

APR1400 DCD TIER 2

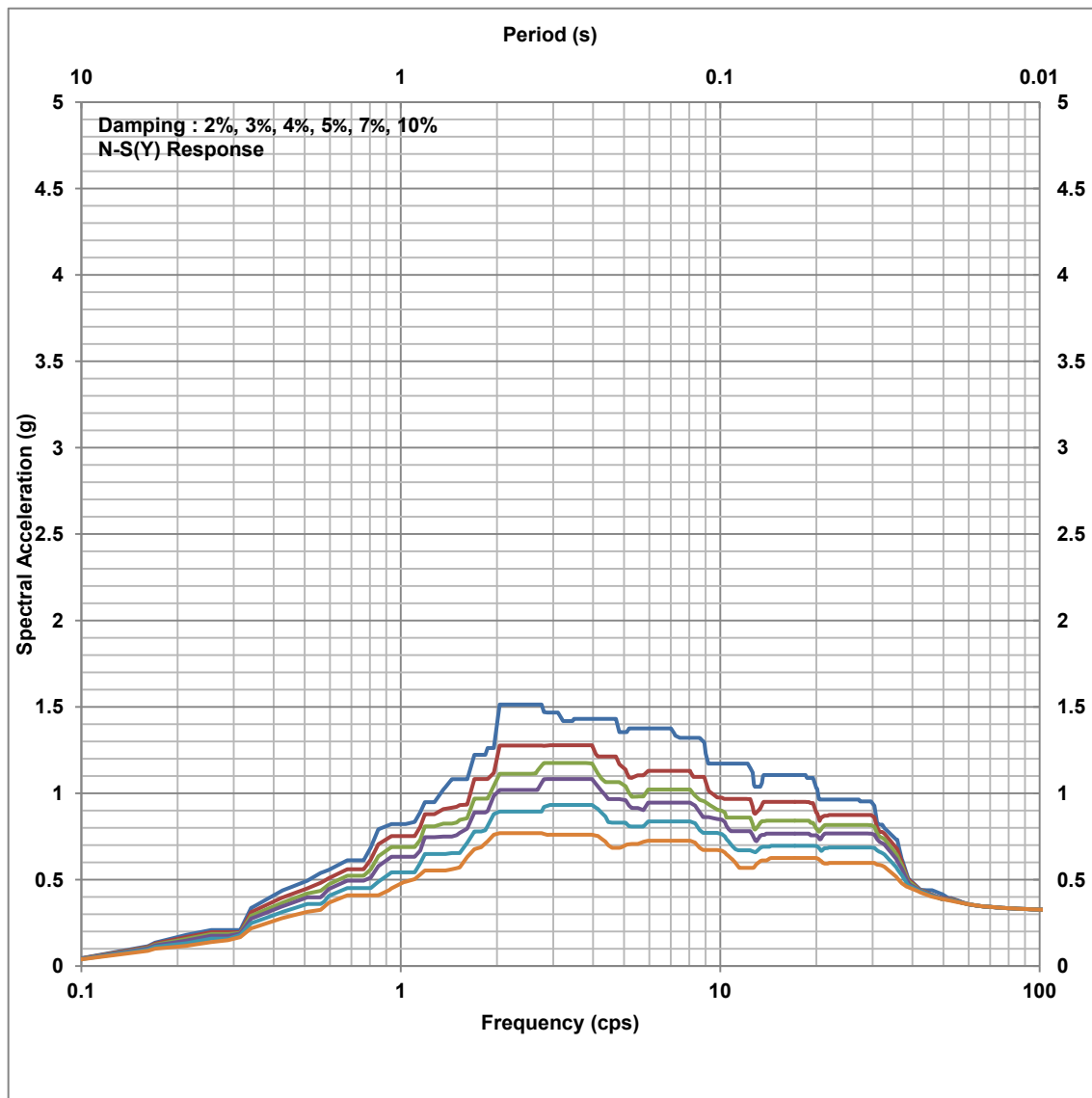


Figure 3.7A-55 Enveloped ISRS for SSE, Auxiliary Building at EL.55'-0", N-S, Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

APR1400 DCD TIER 2

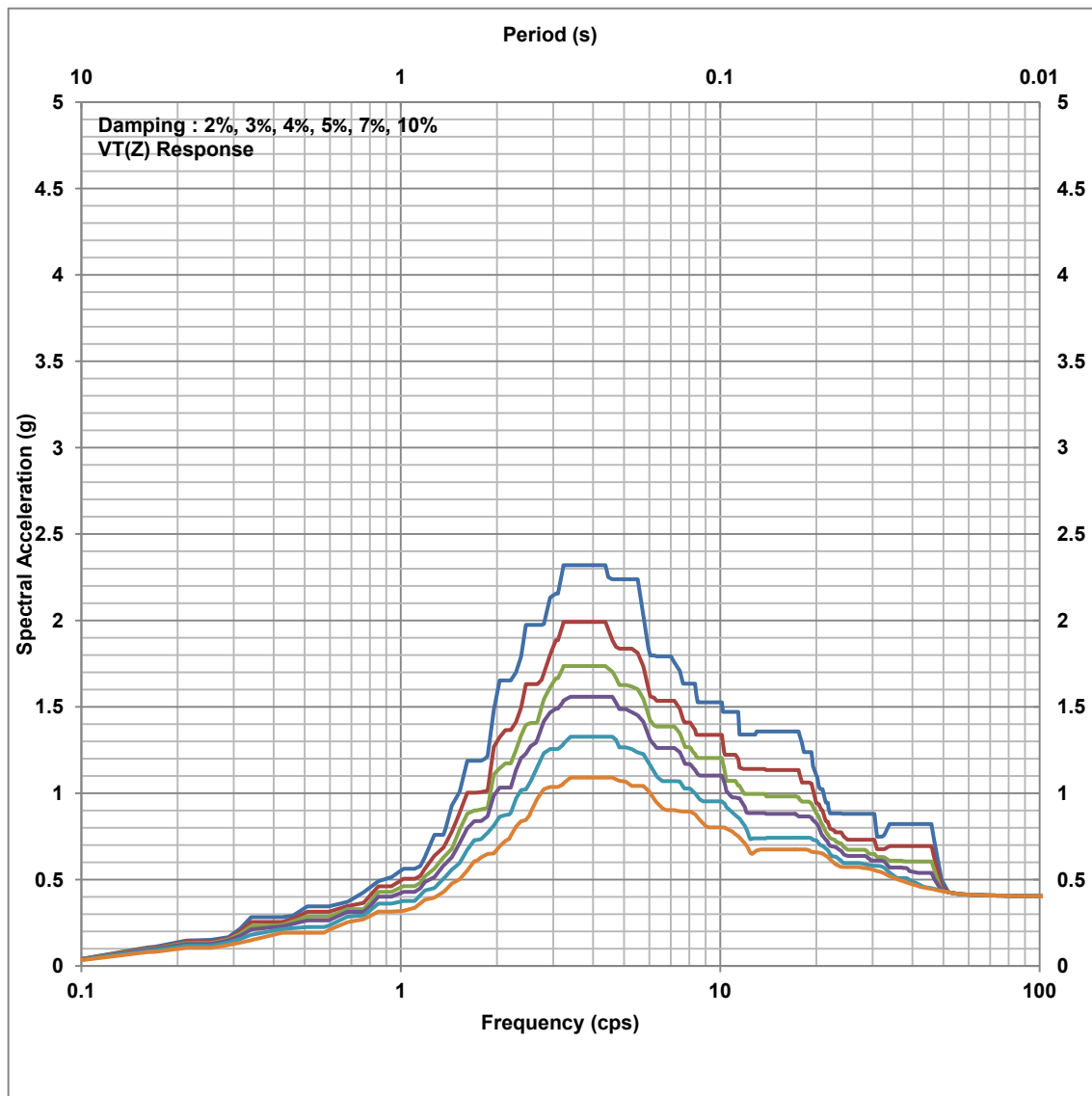


Figure 3.7A-56 Enveloped ISRS for SSE, Auxiliary Building at EL.55'-0", Vertical, Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

APR1400 DCD TIER 2

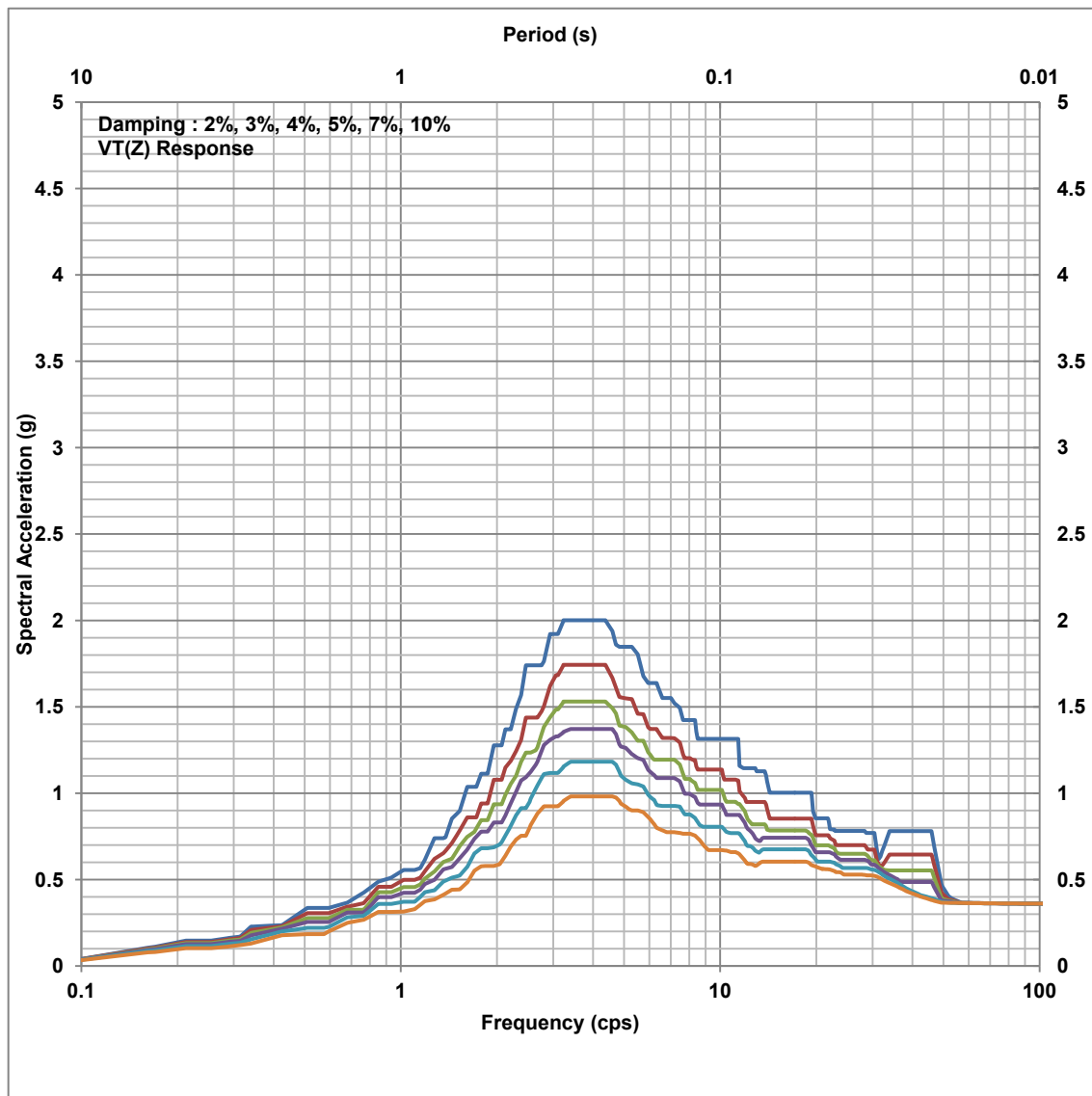


Figure 3.7A-57 Enveloped ISRS for SSE, Auxiliary Building at EL.55'-0" (Slab), Vertical, Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

APR1400 DCD TIER 2

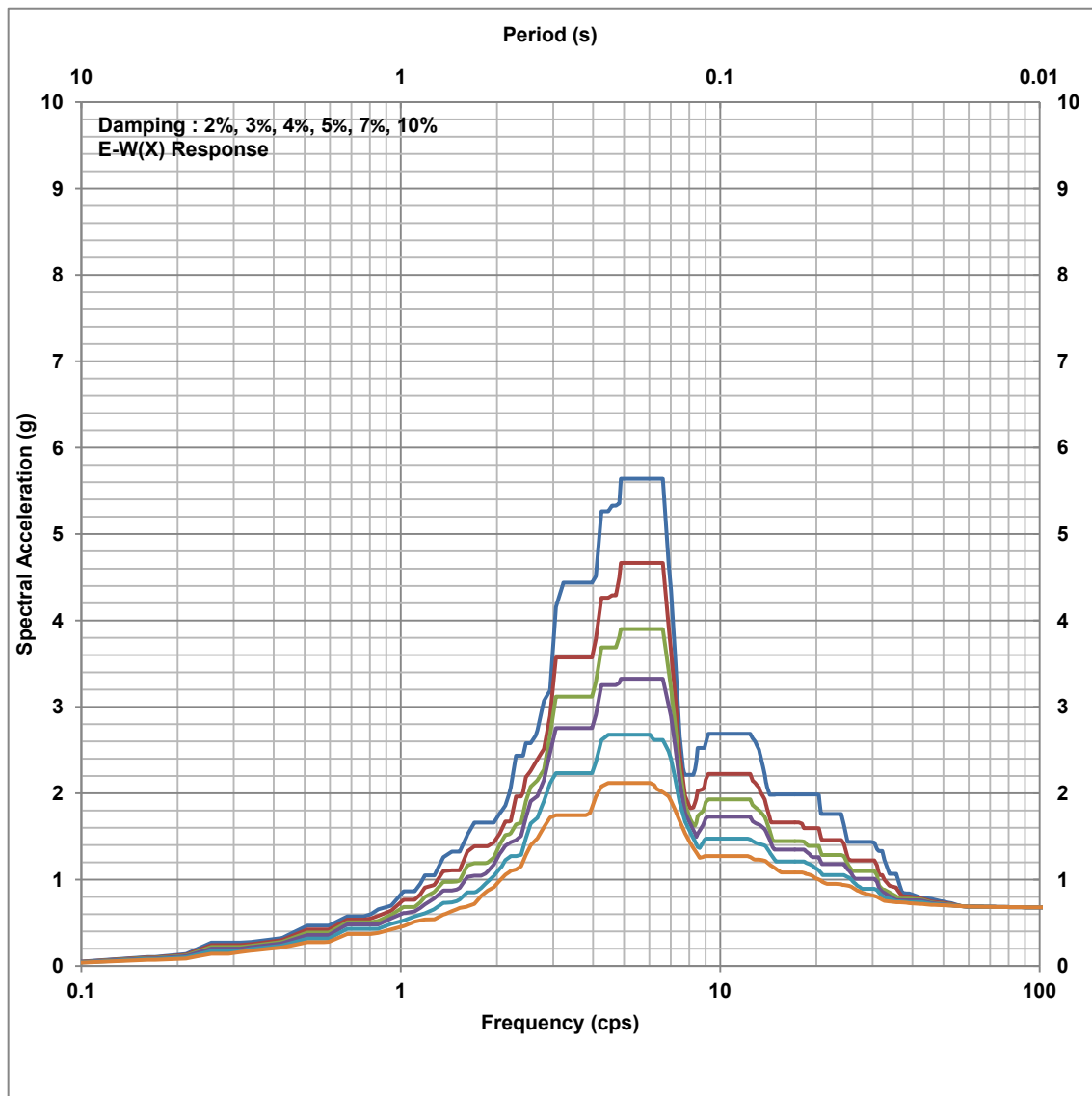


Figure 3.7A-58 Enveloped ISRS for SSE, Auxiliary Building at EL.100'-0" (General), E-W, Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

APR1400 DCD TIER 2

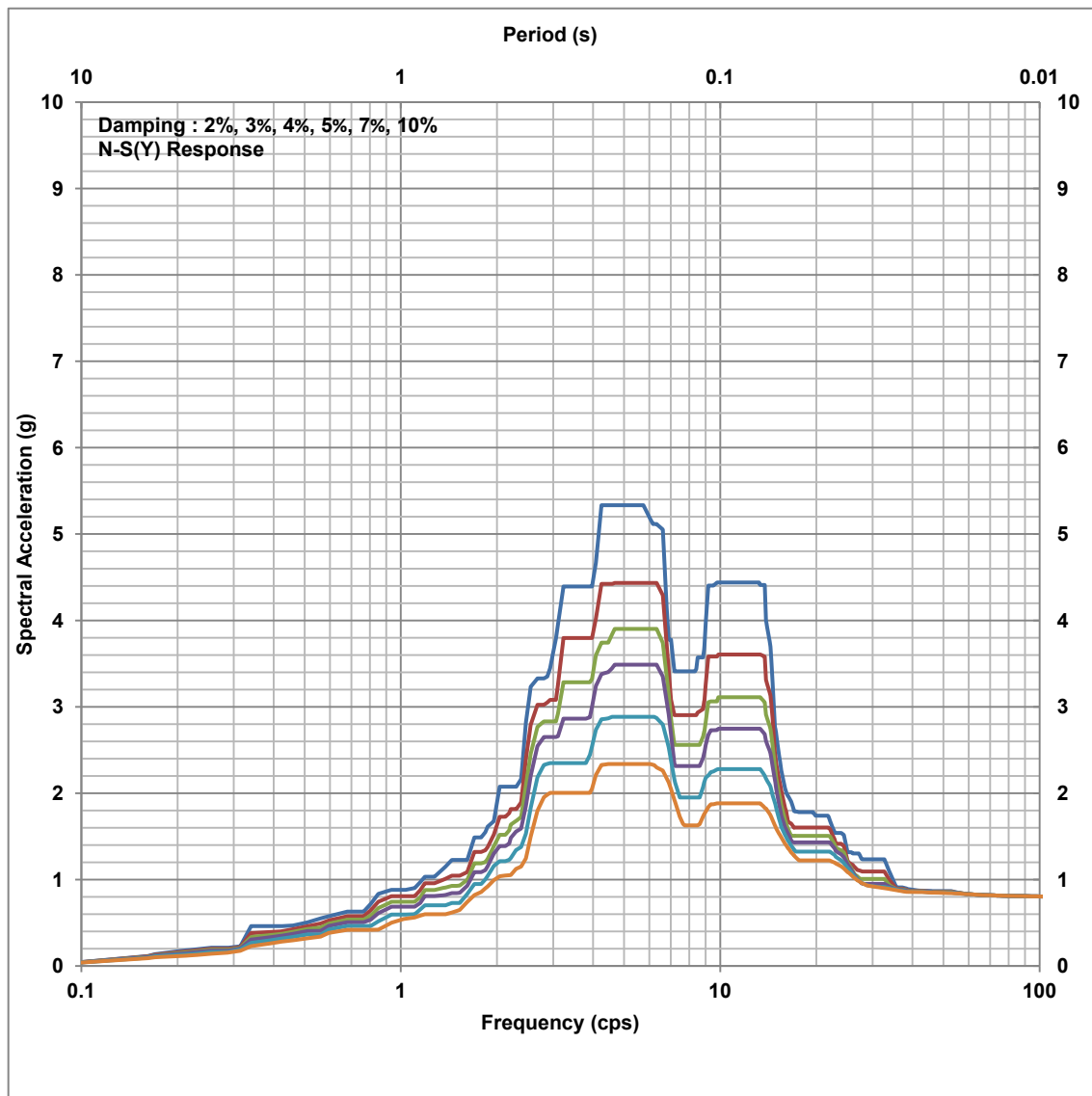


Figure 3.7A-59 Enveloped ISRS for SSE, Auxiliary Building at EL.100'-0" (General), N-S, Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

APR1400 DCD TIER 2

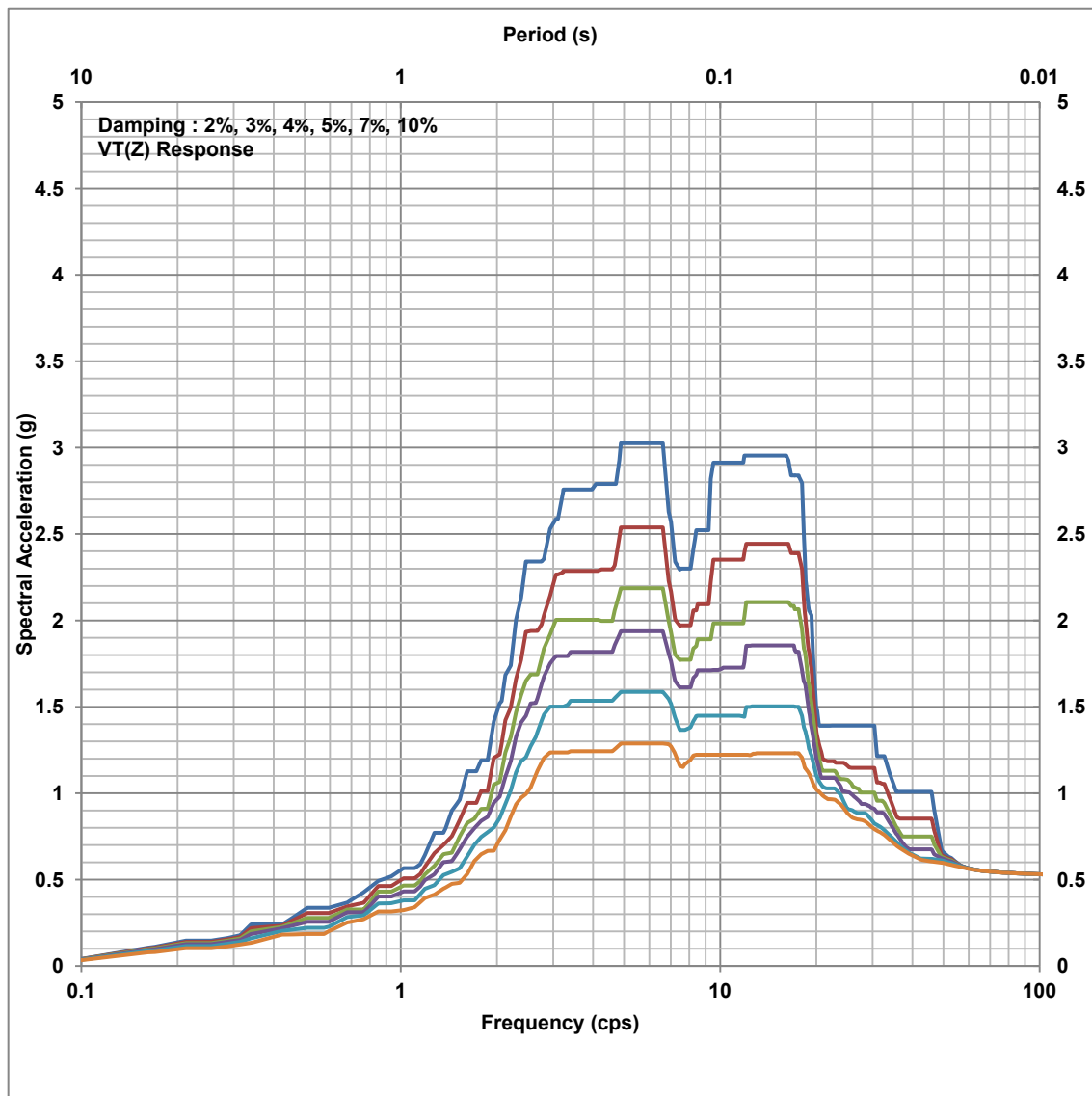


Figure 3.7A-60 Enveloped ISRS for SSE, Auxiliary Building at EL.100'-0" (General), Vertical, Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

APR1400 DCD TIER 2

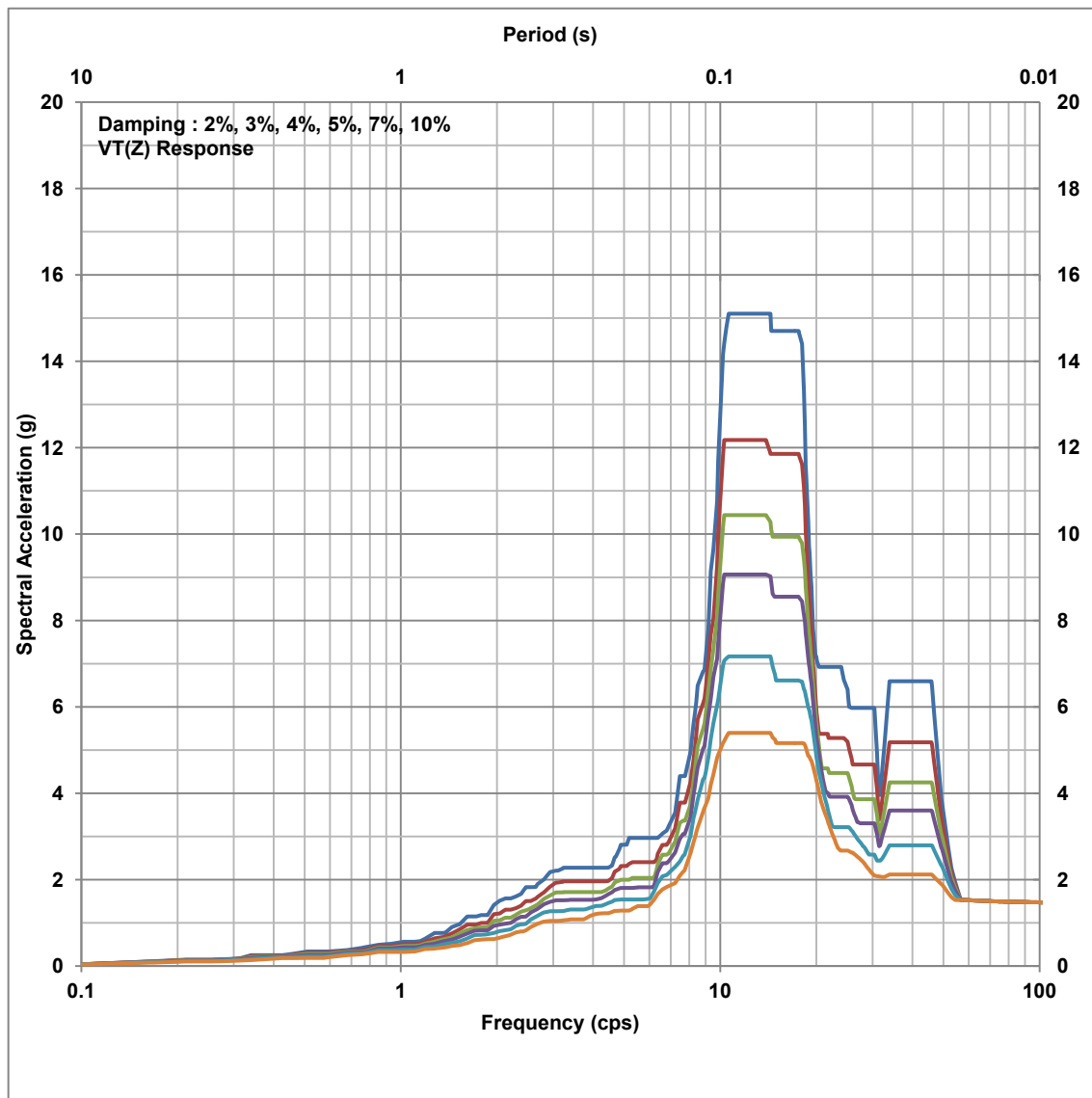


Figure 3.7A-61 Enveloped ISRS for SSE, Auxiliary Building at EL.100'-0",
(General Slab), Vertical, Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

APR1400 DCD TIER 2

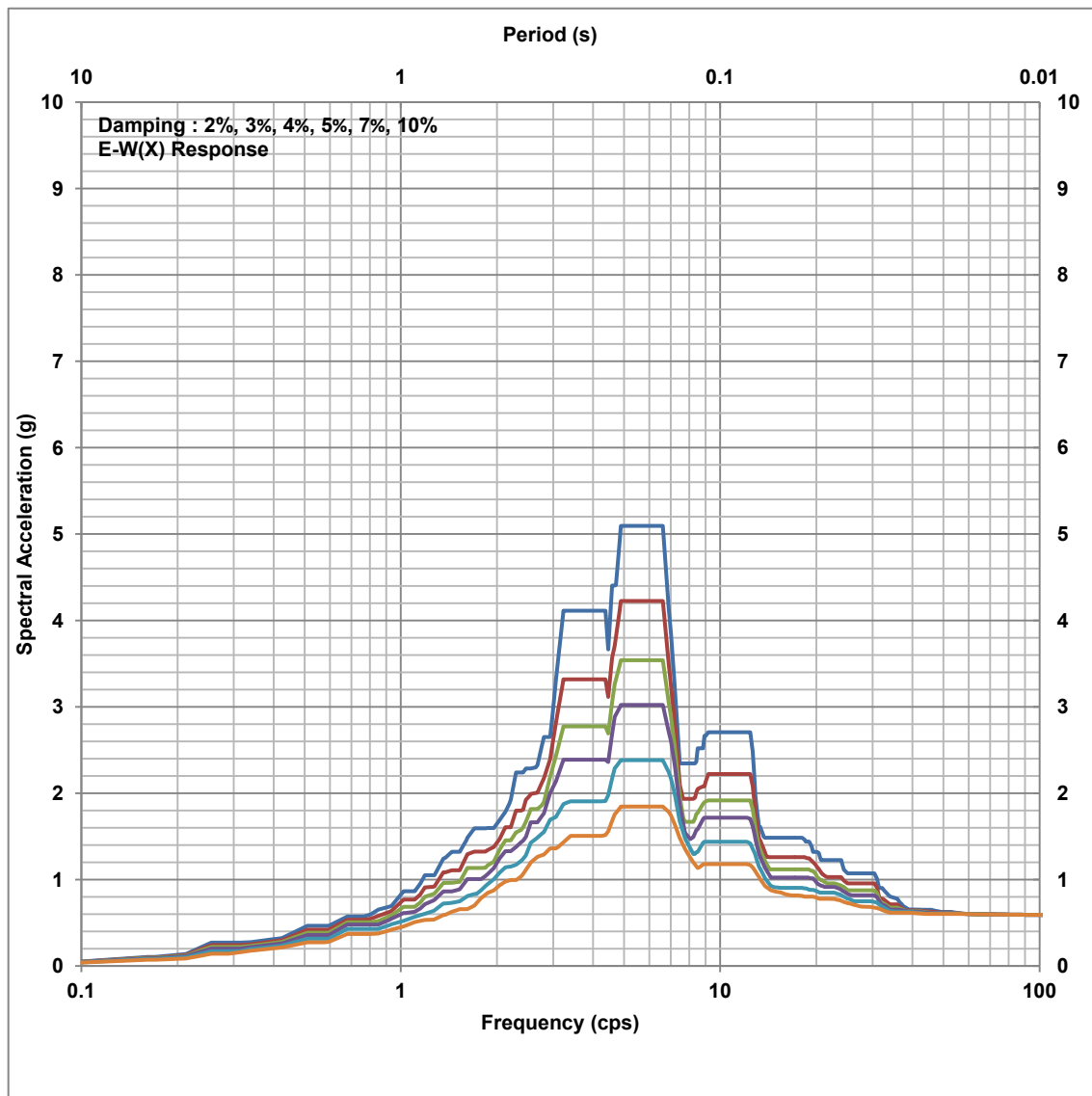


Figure 3.7A-62 Enveloped ISRS for SSE, Auxiliary Building at EL.100'-0" (Fuel Handling Area), E-W, Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

APR1400 DCD TIER 2

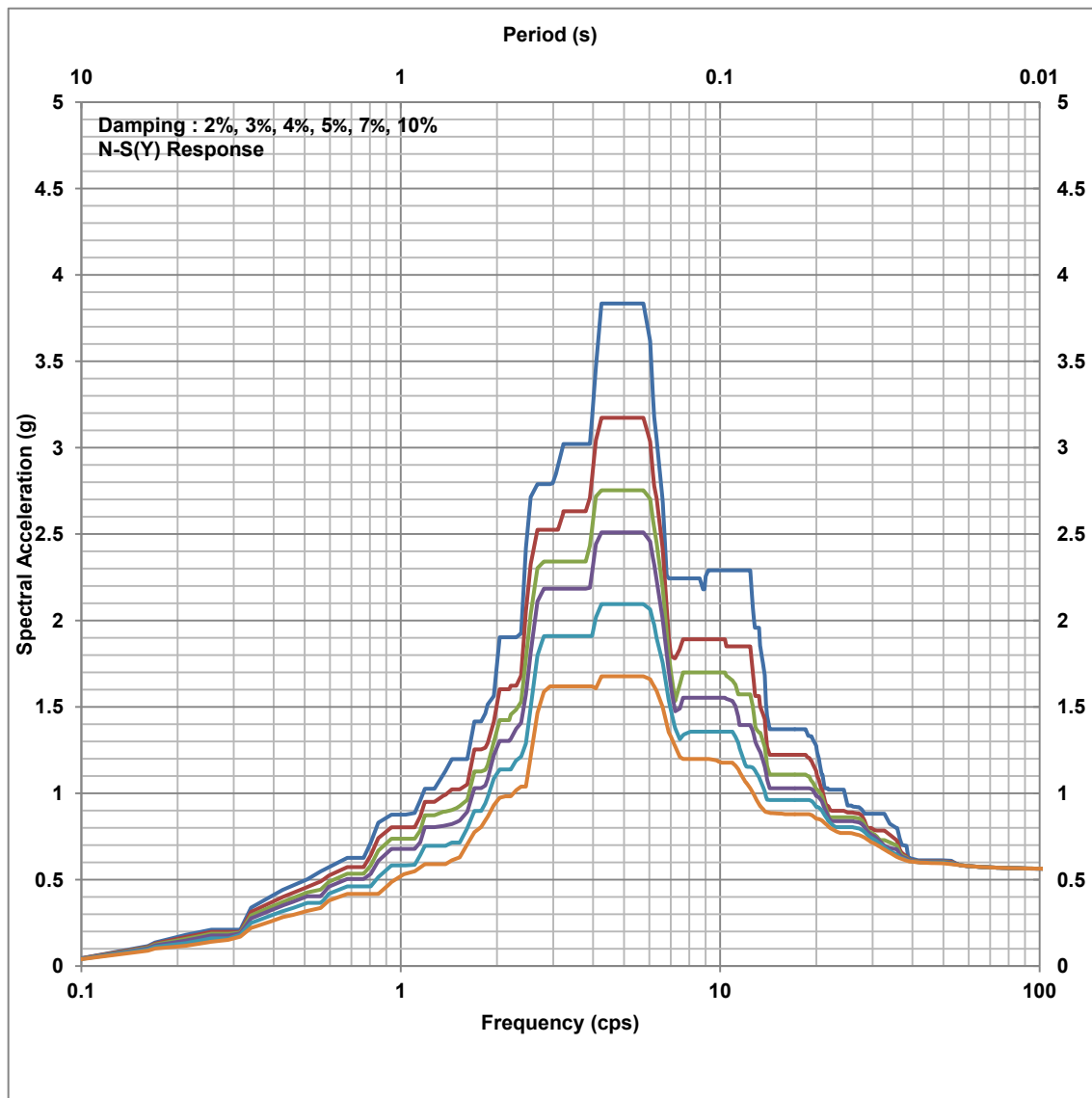


Figure 3.7A-63 Enveloped ISRS for SSE, Auxiliary Building at EL.100'-0"
(Fuel Handling Area), N-S, Damping Ratio 2%, 3%, 4%, 5%, 7%,
10%

APR1400 DCD TIER 2

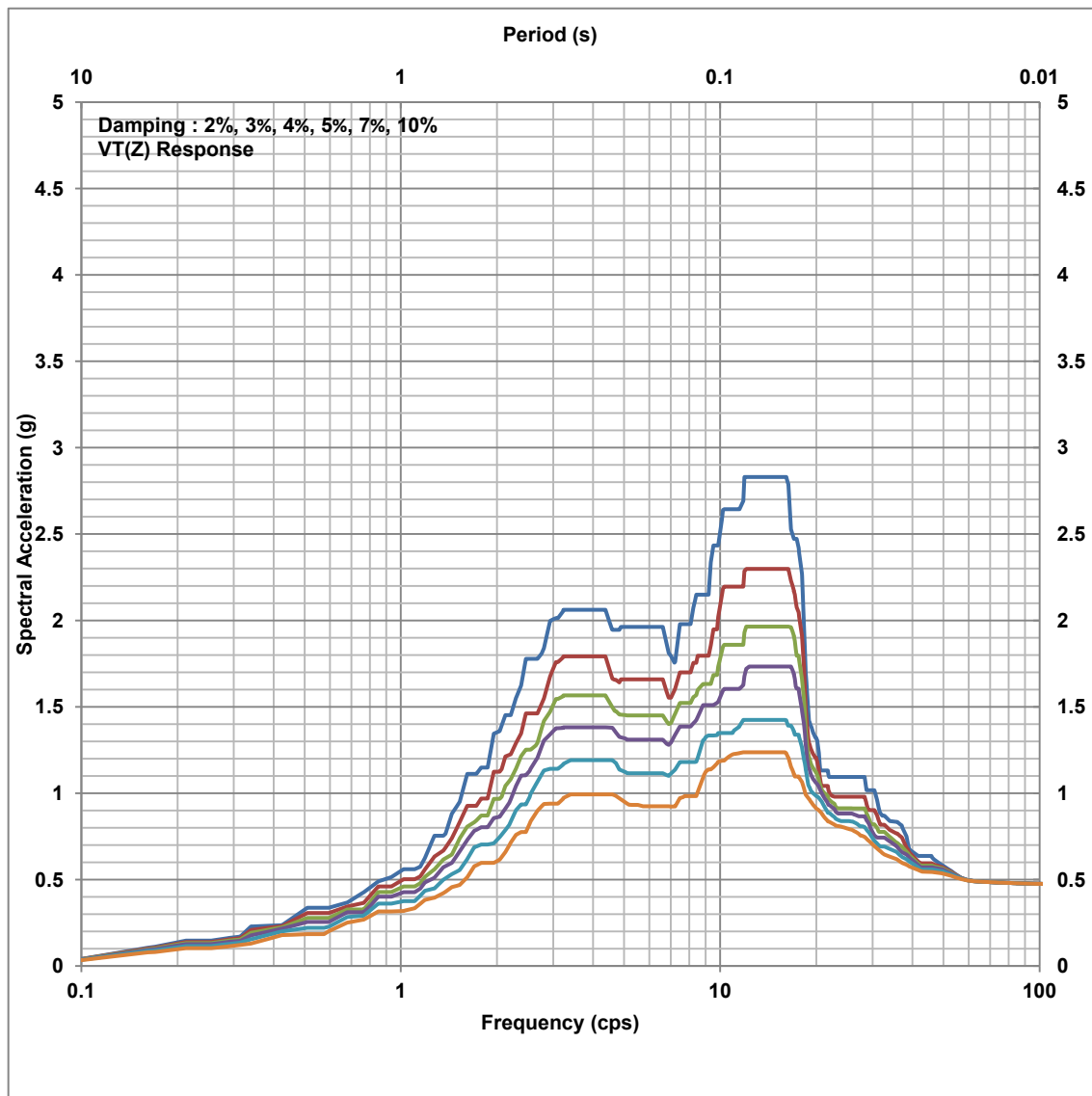


Figure 3.7A-64 Enveloped ISRS for SSE, Auxiliary Building at EL.100'-0"
(Fuel Handling Area), Vertical, Damping Ratio 2%, 3%, 4%, 5%,
7%, 10%

APR1400 DCD TIER 2

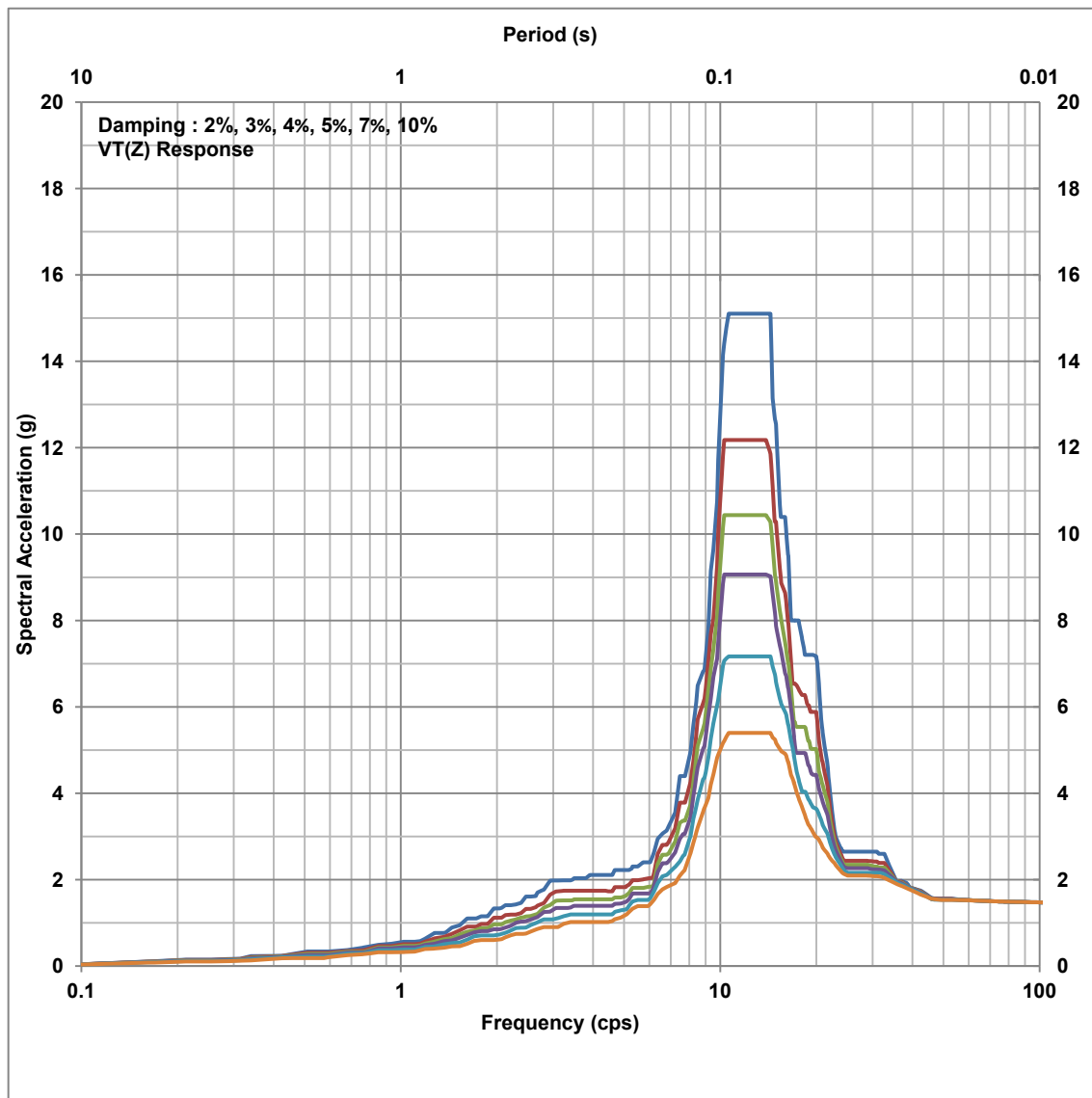


Figure 3.7A-65 Enveloped ISRS for SSE, Auxiliary Building at EL.100'-0" (Fuel Handling Area Slab), Vertical, Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

APR1400 DCD TIER 2

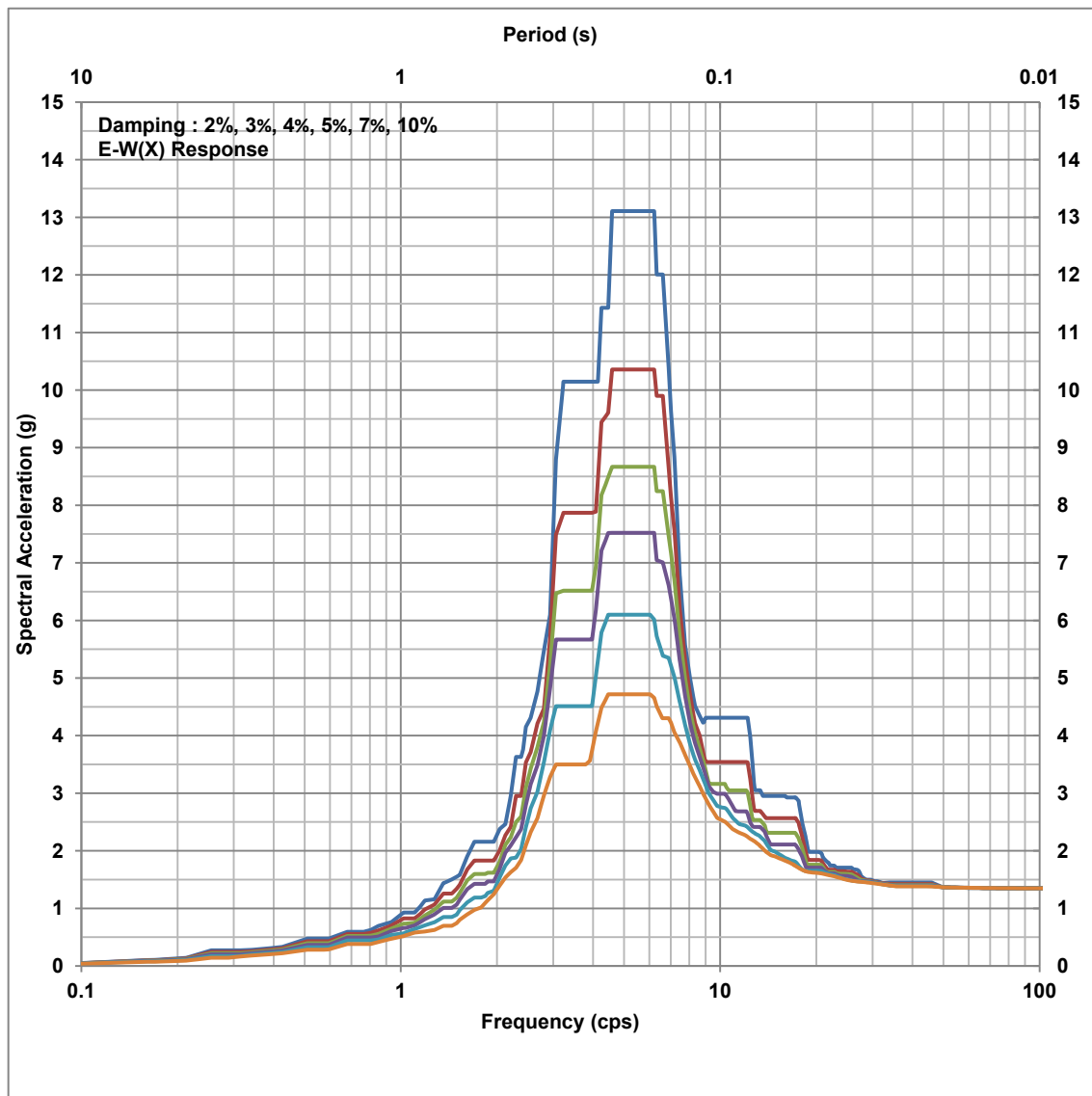


Figure 3.7A-66 Enveloped ISRS for SSE, Auxiliary Building at EL.156'-0", E-W,
Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

APR1400 DCD TIER 2

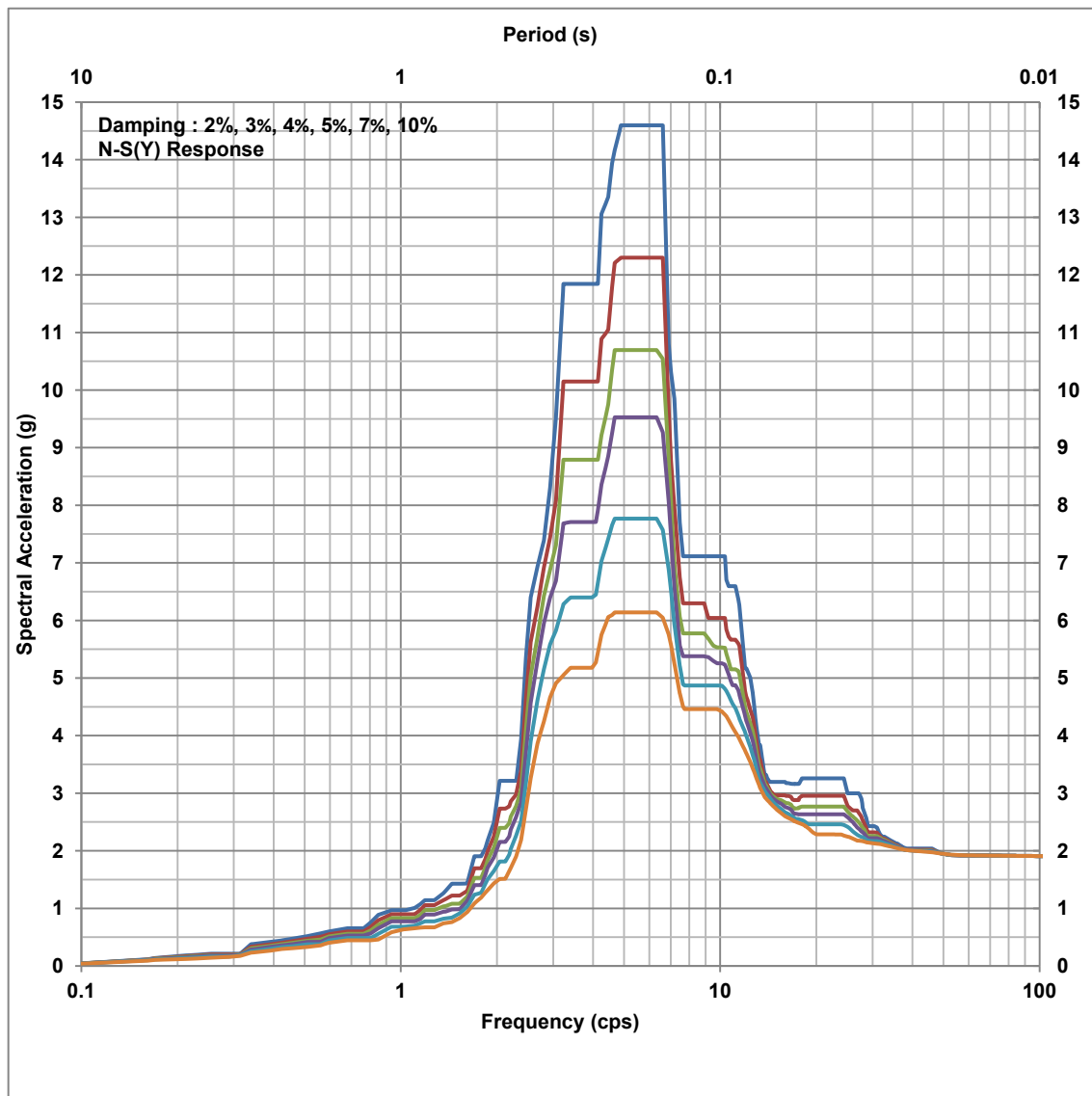


Figure 3.7A-67 Enveloped ISRS for SSE, Auxiliary Building at EL.156'-0",
N-S, Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

APR1400 DCD TIER 2

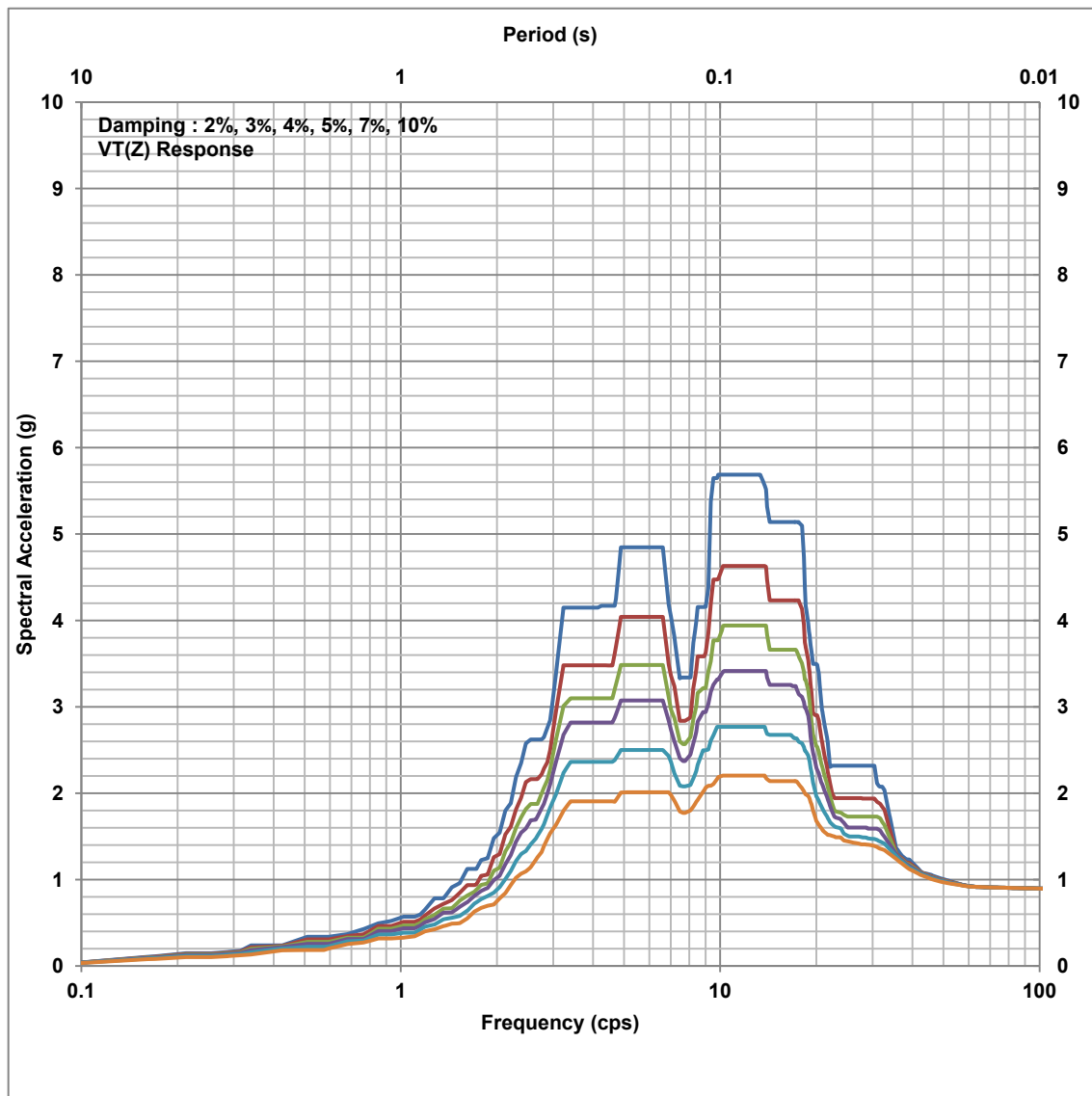


Figure 3.7A-68 Enveloped ISRS for SSE, Auxiliary Building at EL.156'-0", Vertical, Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

APR1400 DCD TIER 2

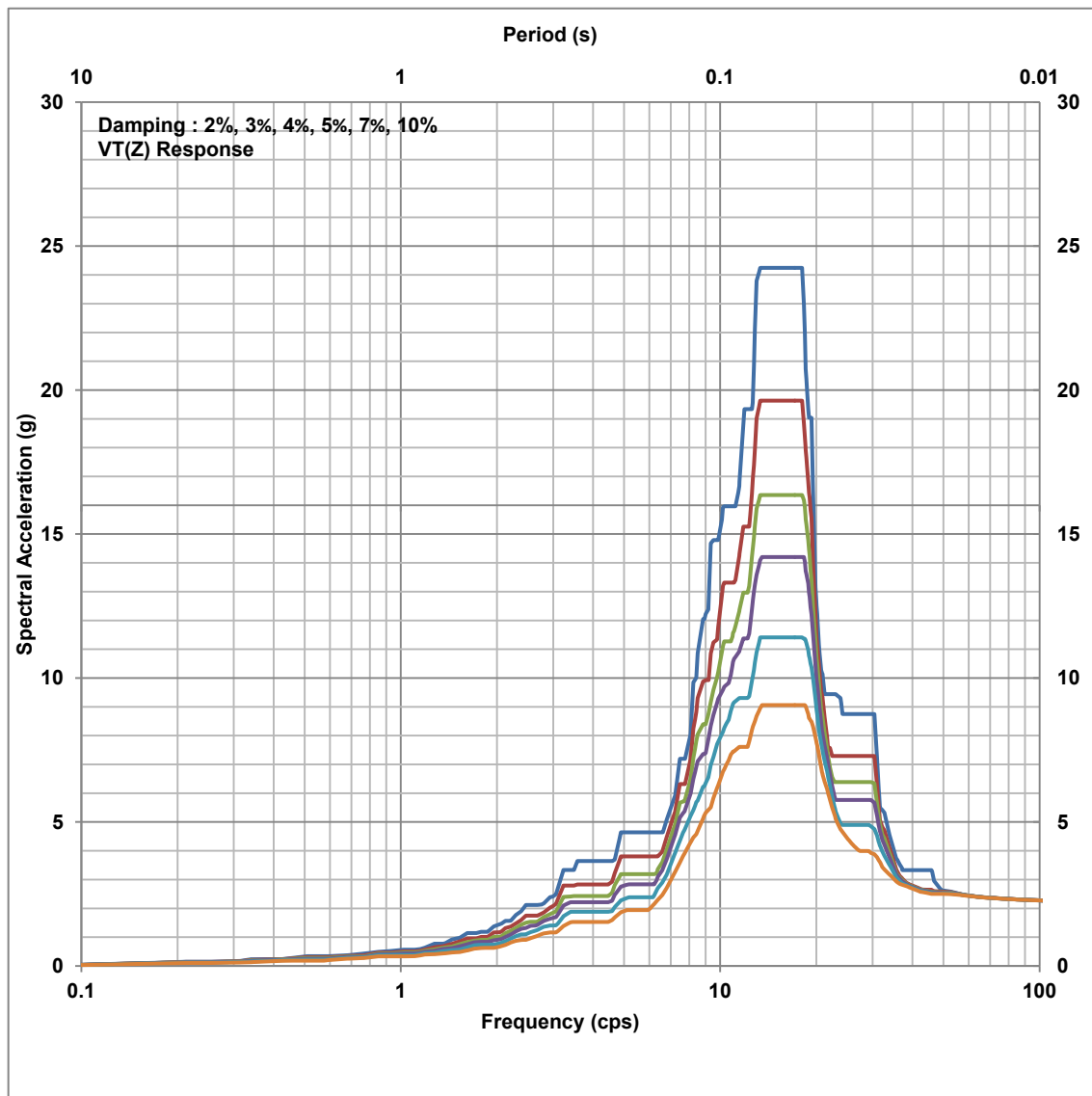


Figure 3.7A-69 Enveloped ISRS for SSE, Auxiliary Building at EL.156'-0" (Slab), Vertical, Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

APR1400 DCD TIER 2

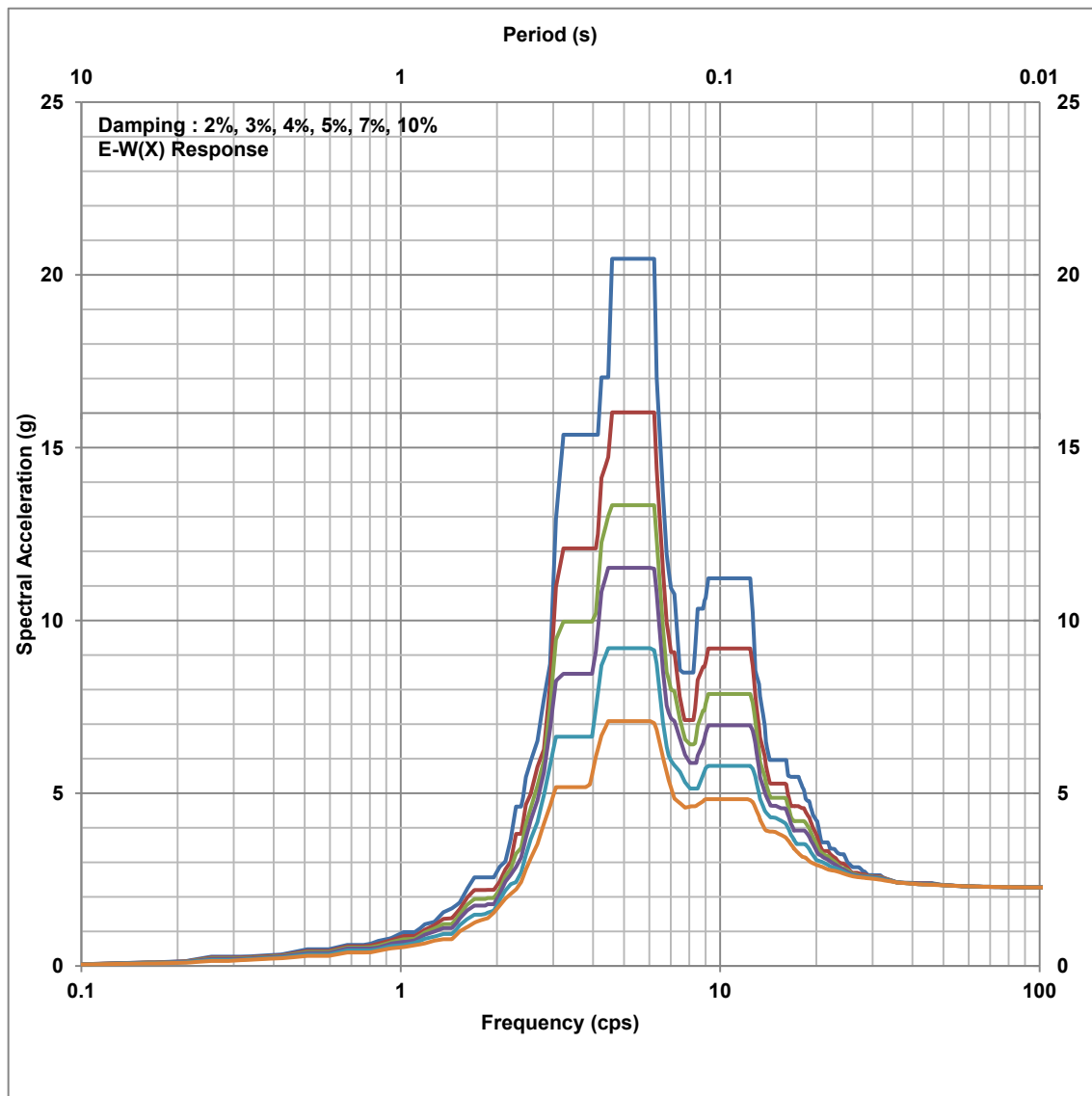


Figure 3.7A-70 Enveloped ISRS for SSE, Auxiliary Building at EL.213'-0",
E-W, Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

APR1400 DCD TIER 2

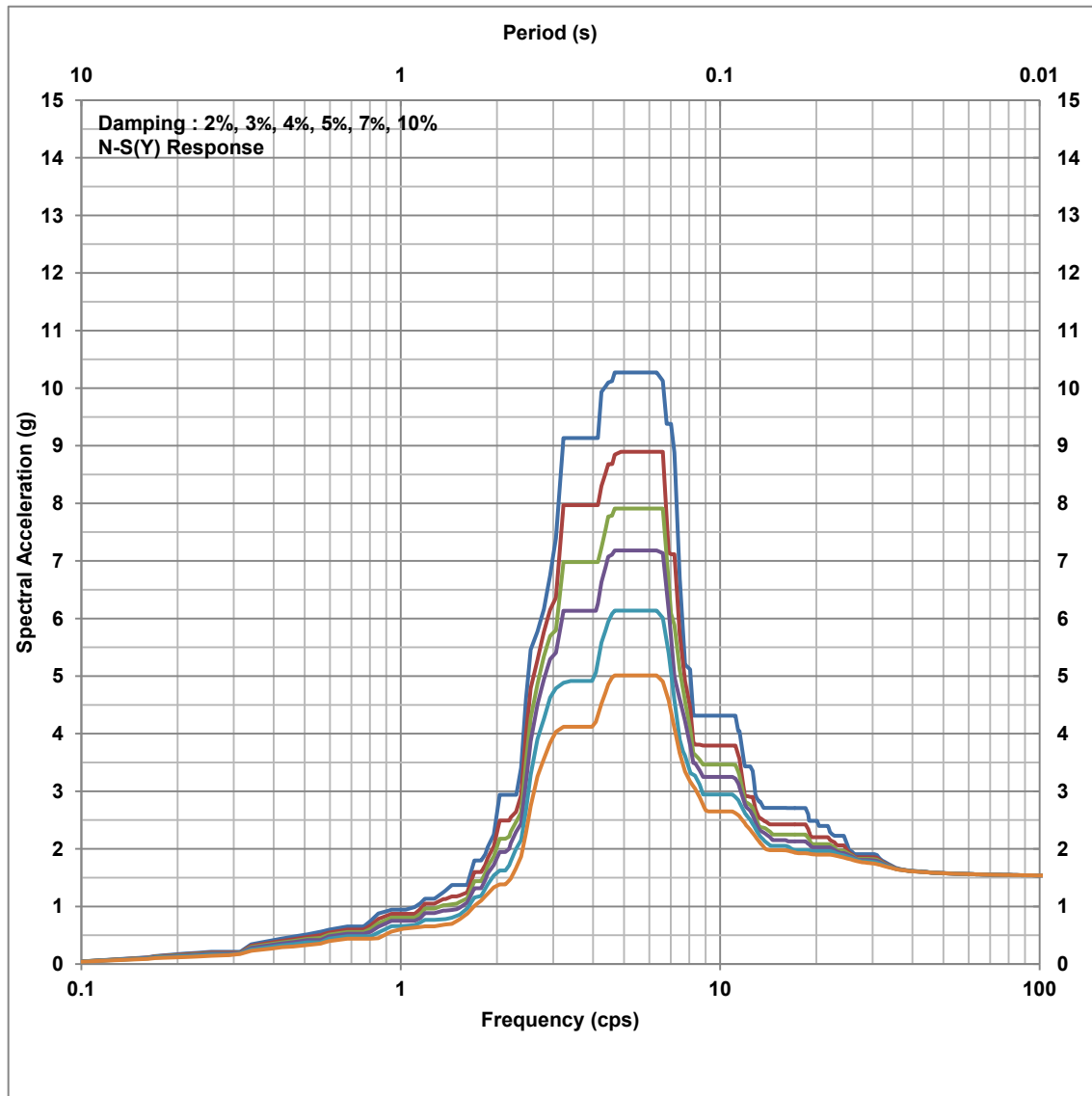


Figure 3.7A-71 Enveloped ISRS for SSE, Auxiliary Building at EL.213'-0", N-S,
Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

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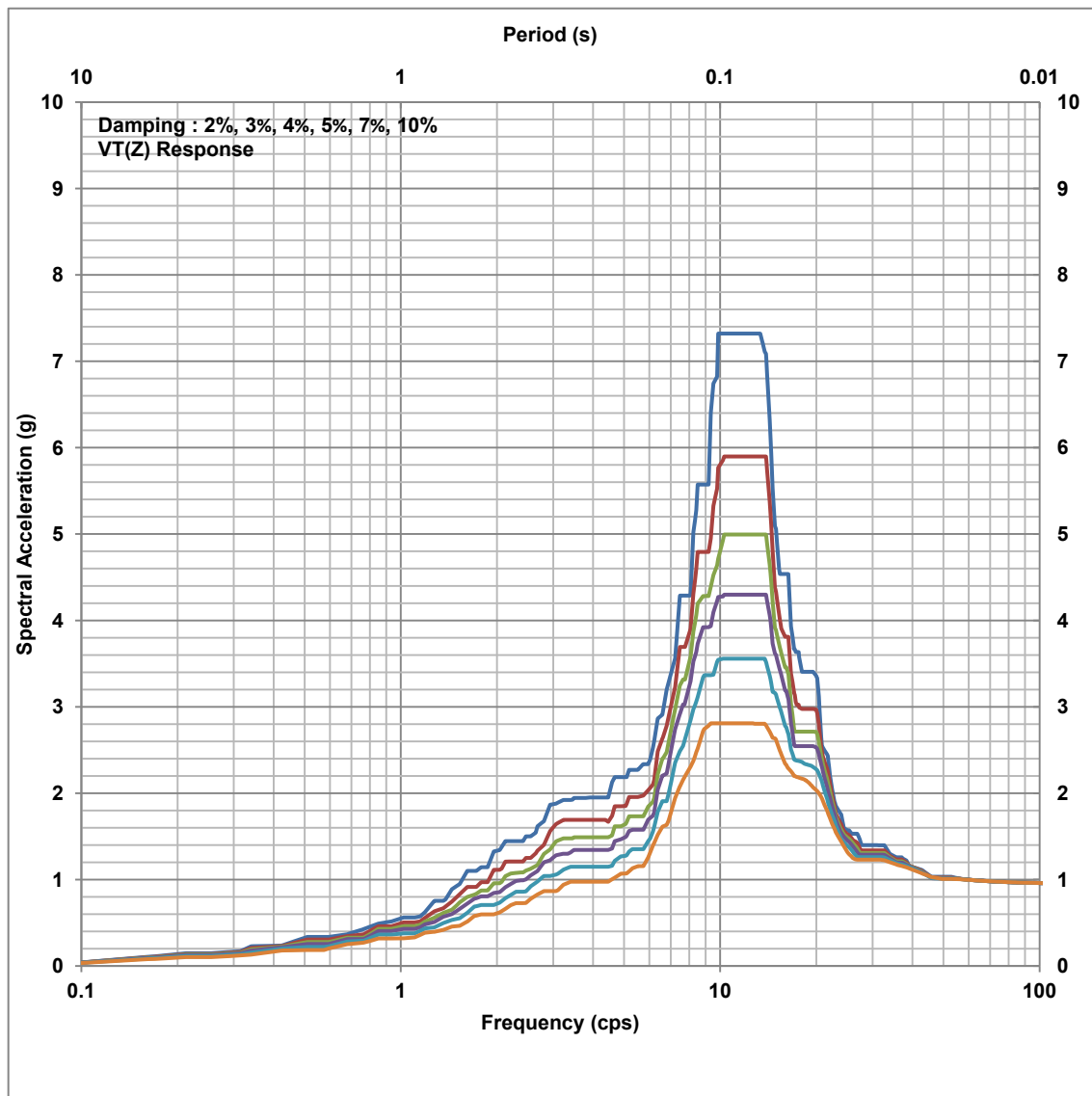


Figure 3.7A-72 Enveloped ISRS for SSE, Auxiliary Building at EL.213'-0", Vertical, Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

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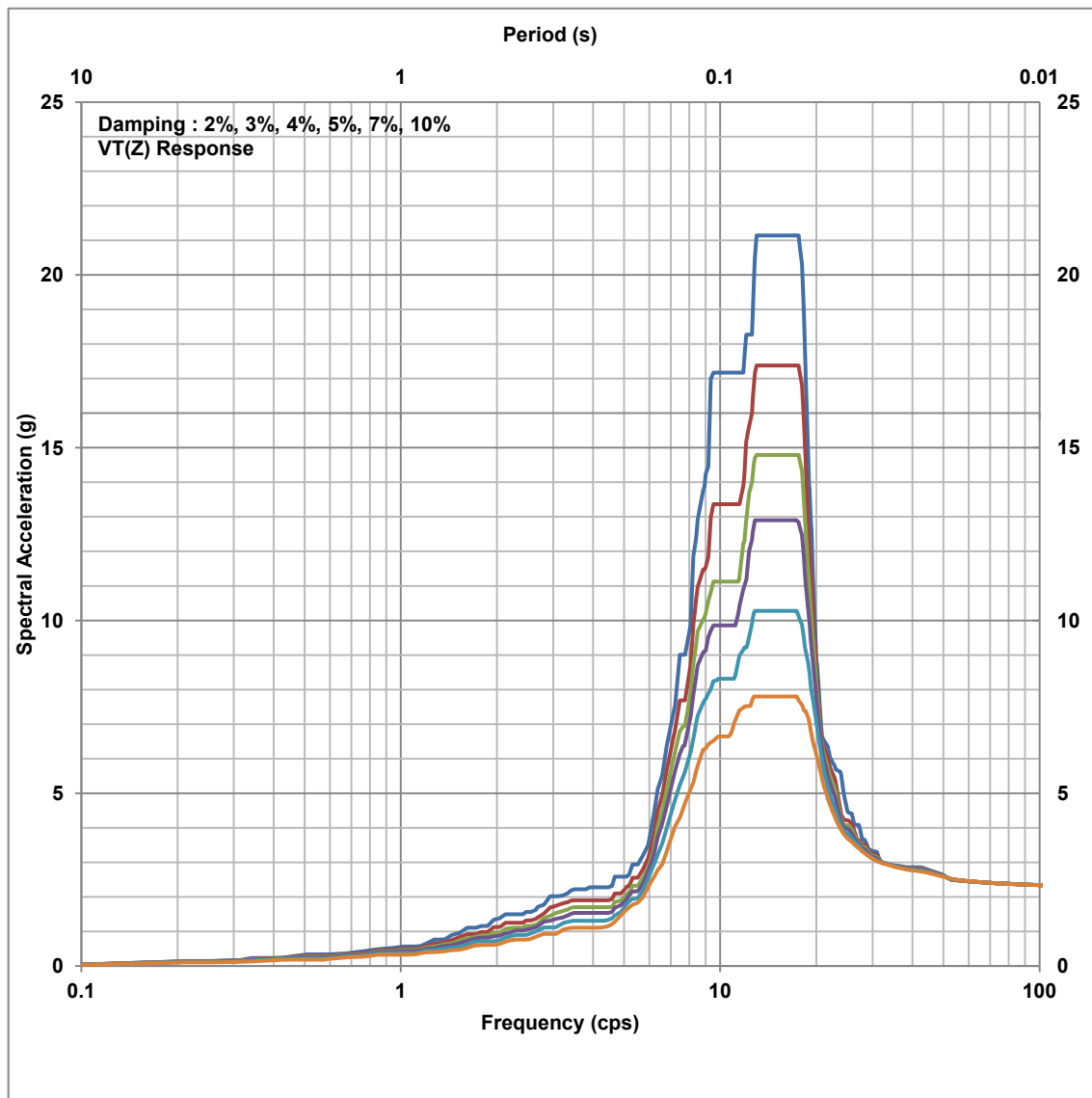


Figure 3.7A-73 Enveloped ISRS for SSE, Auxiliary Building at EL.213'-0" (Slab), Vertical, Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

APR1400 DCD TIER 2

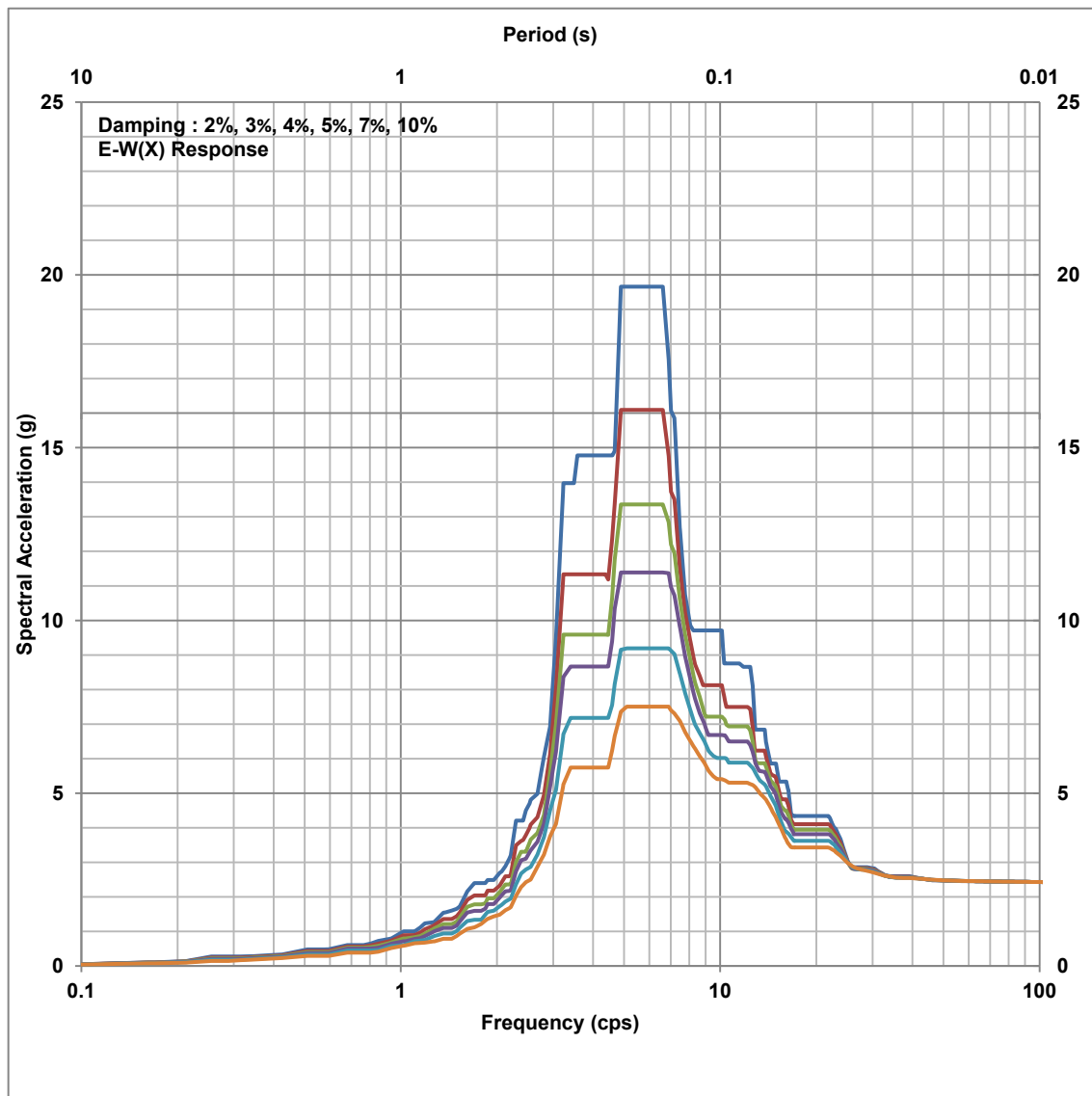


Figure 3.7A-74 Enveloped ISRS for SSE, Auxiliary Building at EL.216'-9", E-W,
Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

APR1400 DCD TIER 2

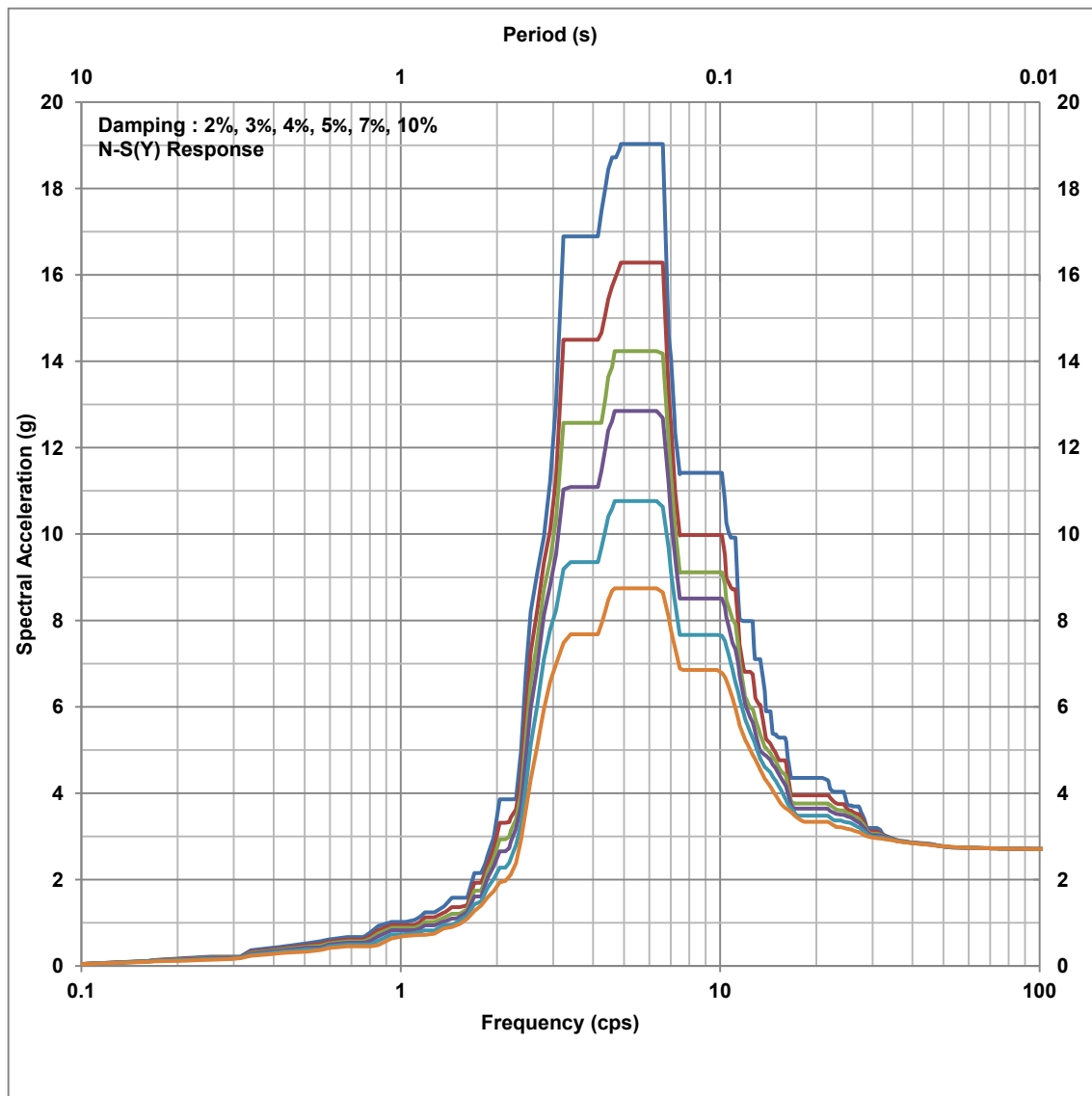


Figure 3.7A-75 Enveloped ISRS for SSE, Auxiliary Building at EL.216'-9", N-S,
Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

APR1400 DCD TIER 2

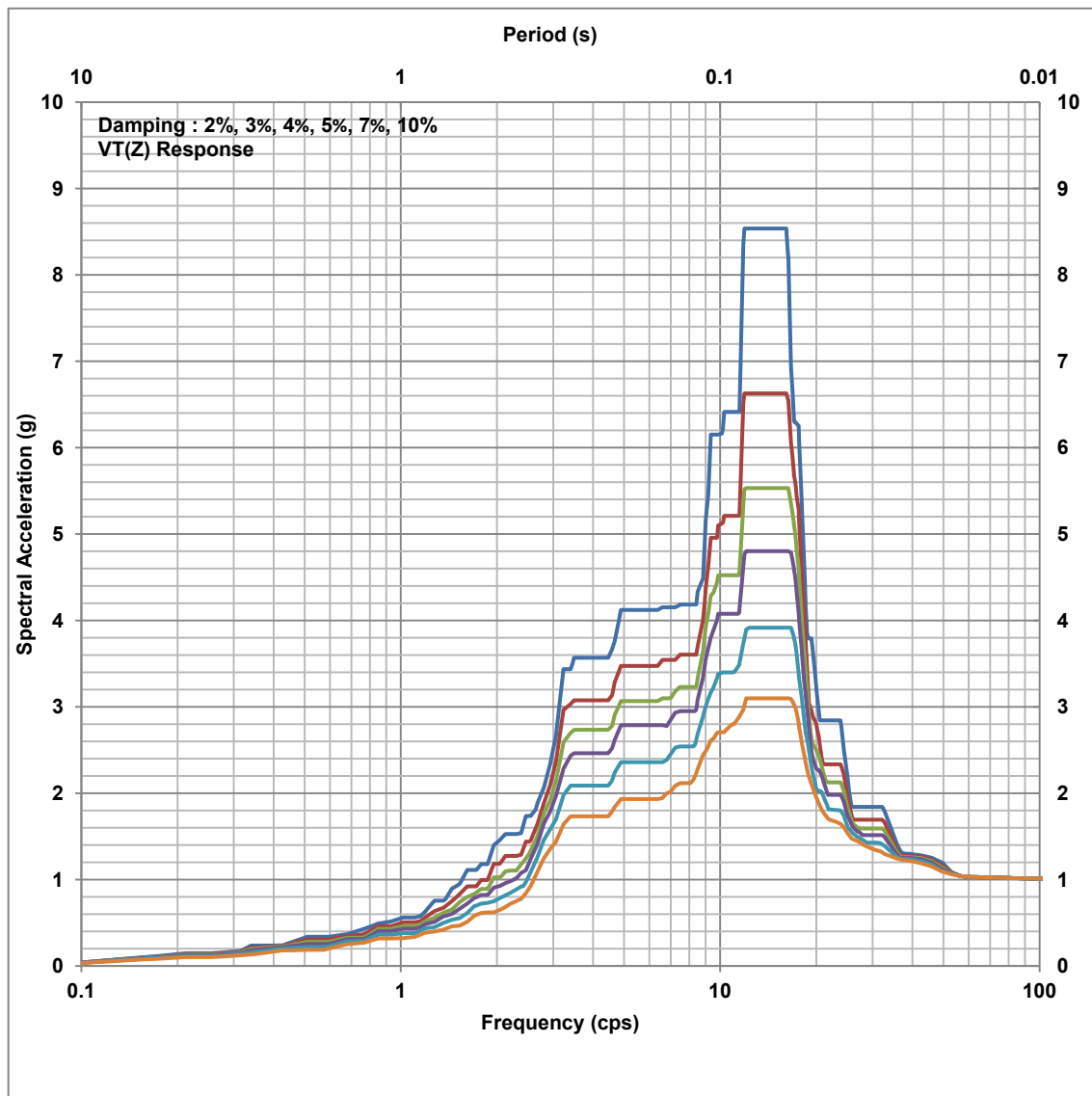


Figure 3.7A-76 Enveloped ISRS for SSE, Auxiliary Building at EL.216'-9", Vertical, Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

APR1400 DCD TIER 2

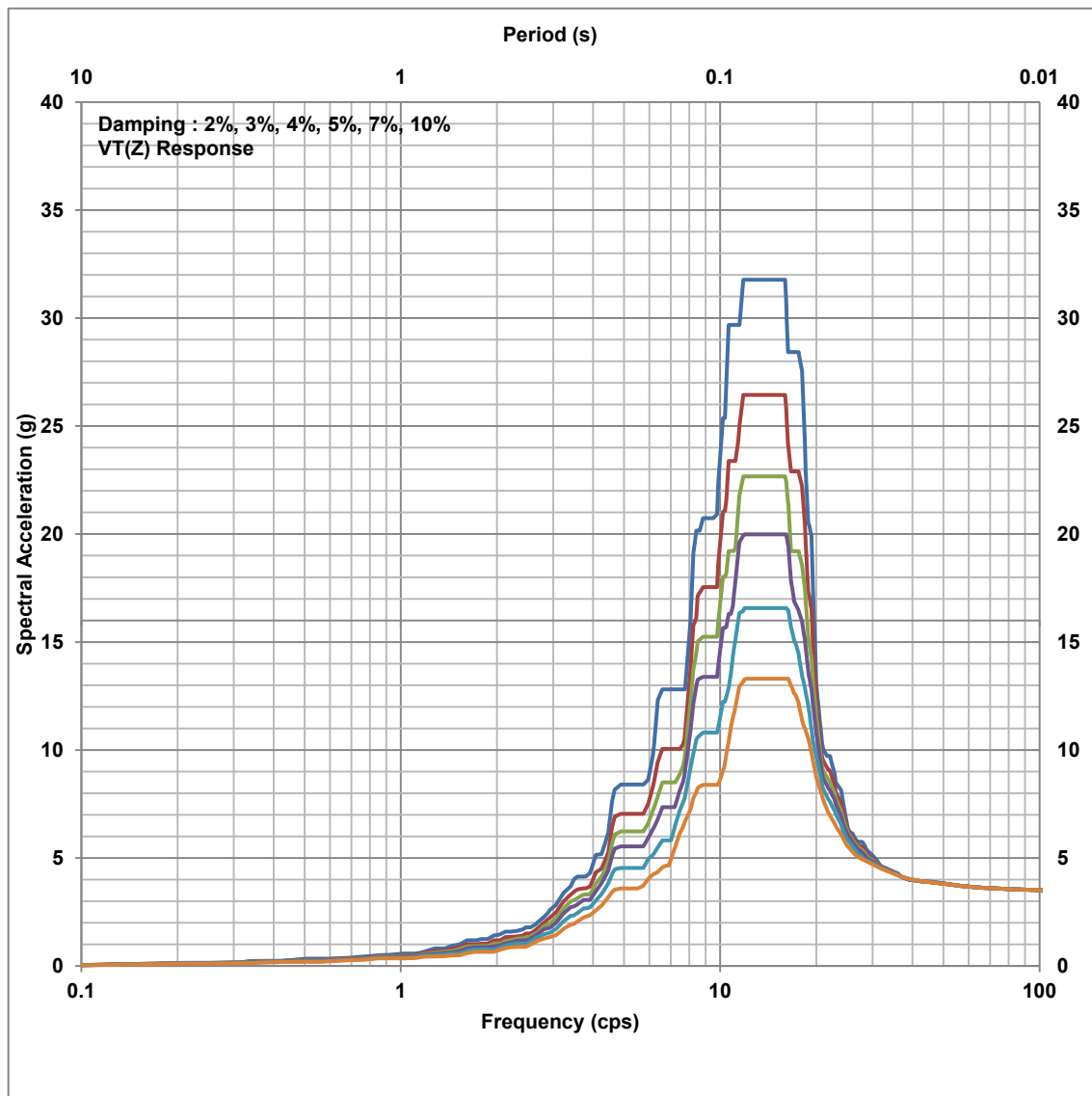


Figure 3.7A-77 Enveloped ISRS for SSE, Auxiliary Building at EL.216'-9" (Slab), Vertical, Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

APR1400 DCD TIER 2

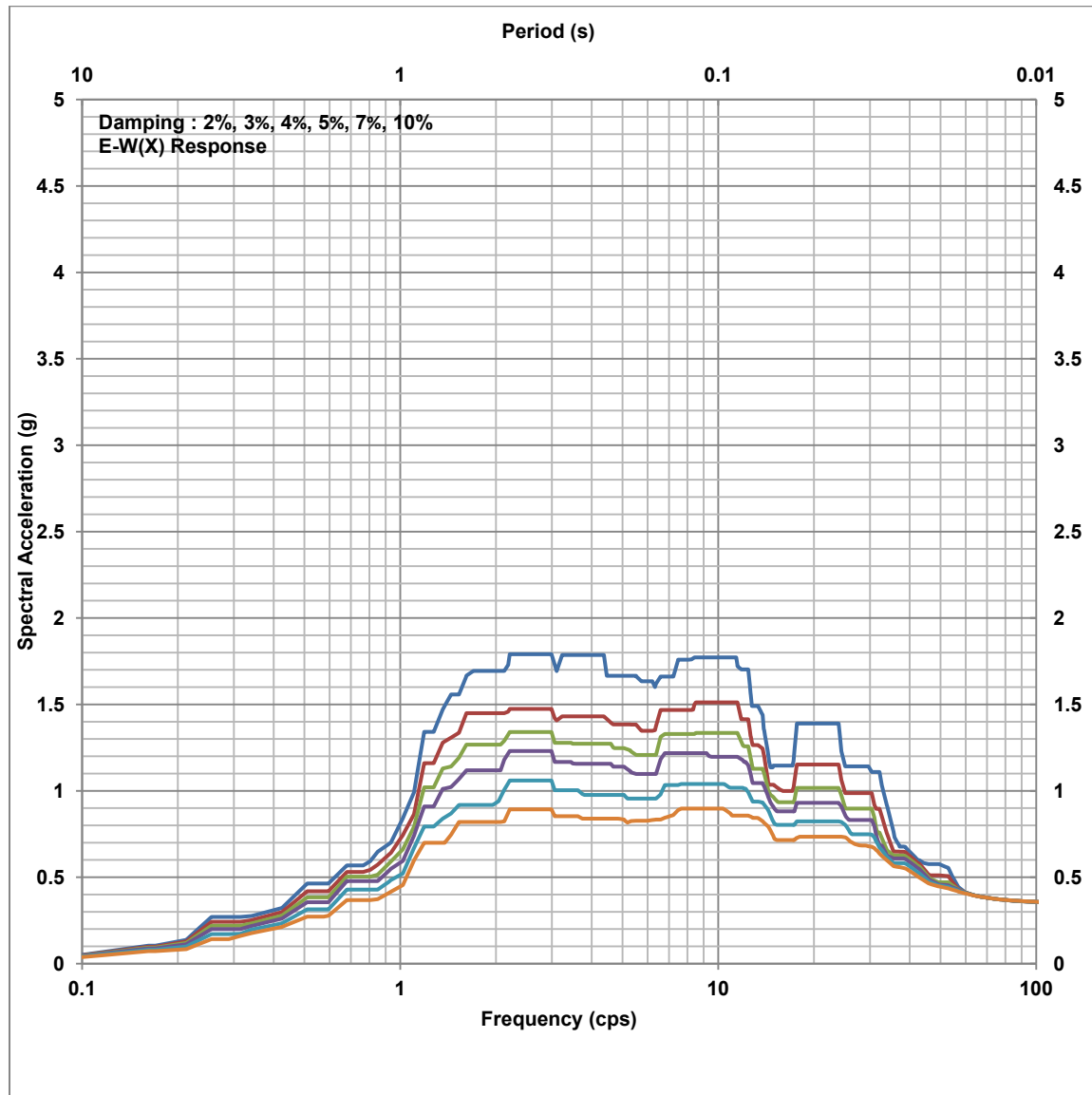


Figure 3.7A-78 Enveloped ISRS for SSE, Emergency Diesel Generator Building at EL.100'-0", E-W, Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

APR1400 DCD TIER 2

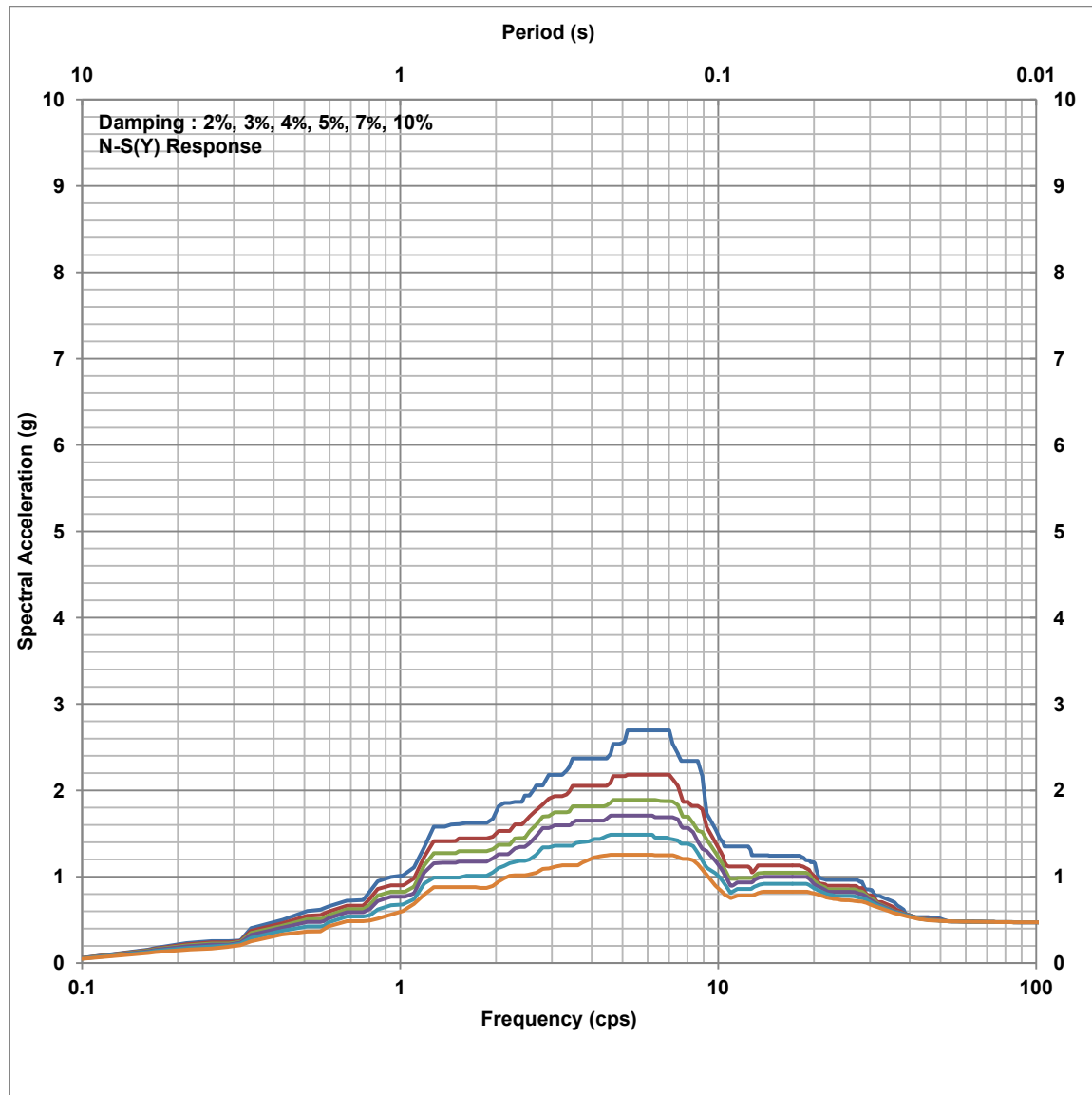


Figure 3.7A-79 Enveloped ISRS for SSE, Emergency Diesel Generator Building at EL.100'-0", N-S, Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

APR1400 DCD TIER 2

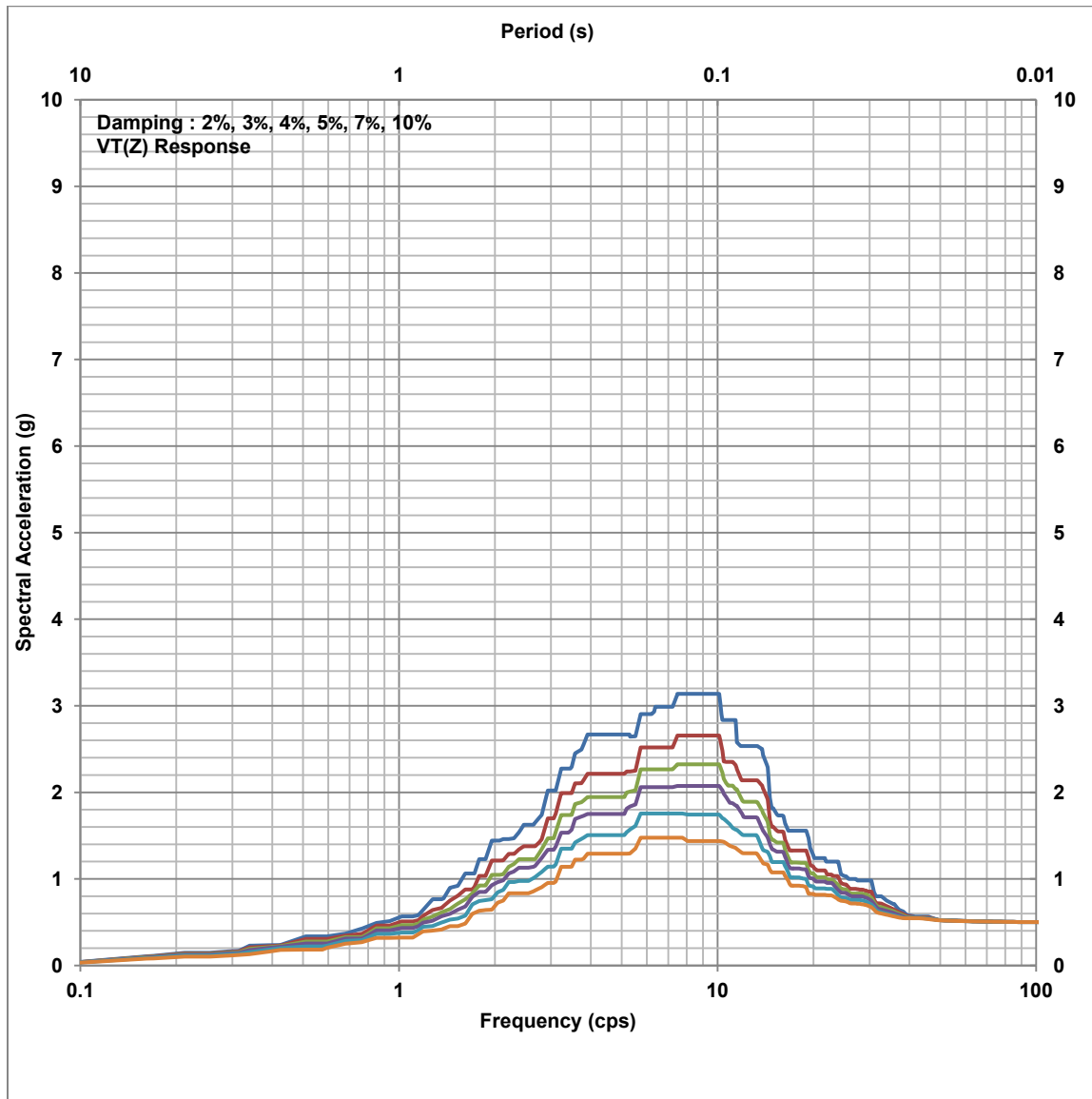


Figure 3.7A-80 Enveloped ISRS for SSE, Emergency Diesel Generator Building at EL.100'-0", Vertical, Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

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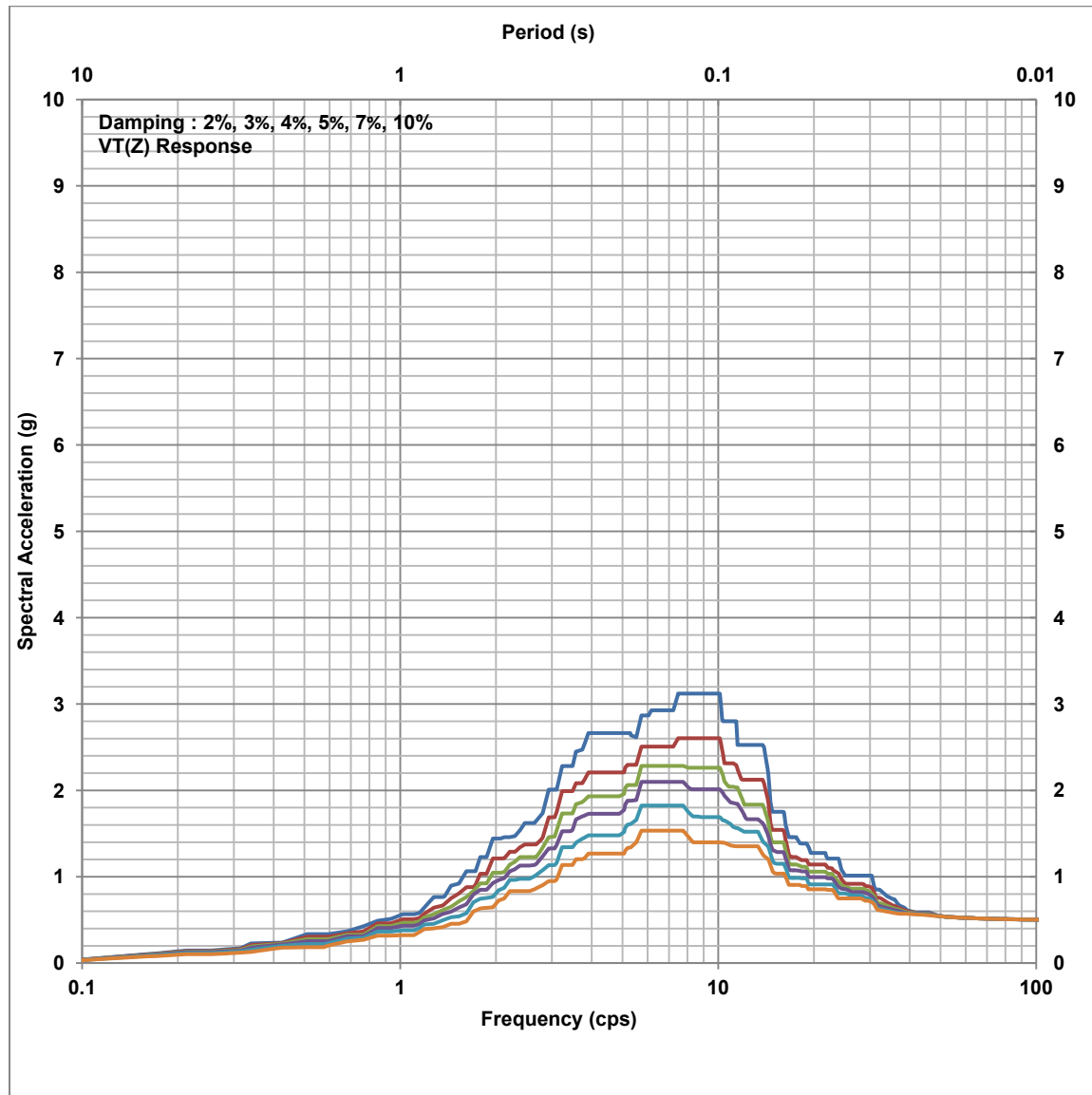


Figure 3.7A-81 Enveloped ISRS for SSE, Emergency Diesel Generator Building at EL.100'-0" (Slab), Vertical, Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

APR1400 DCD TIER 2

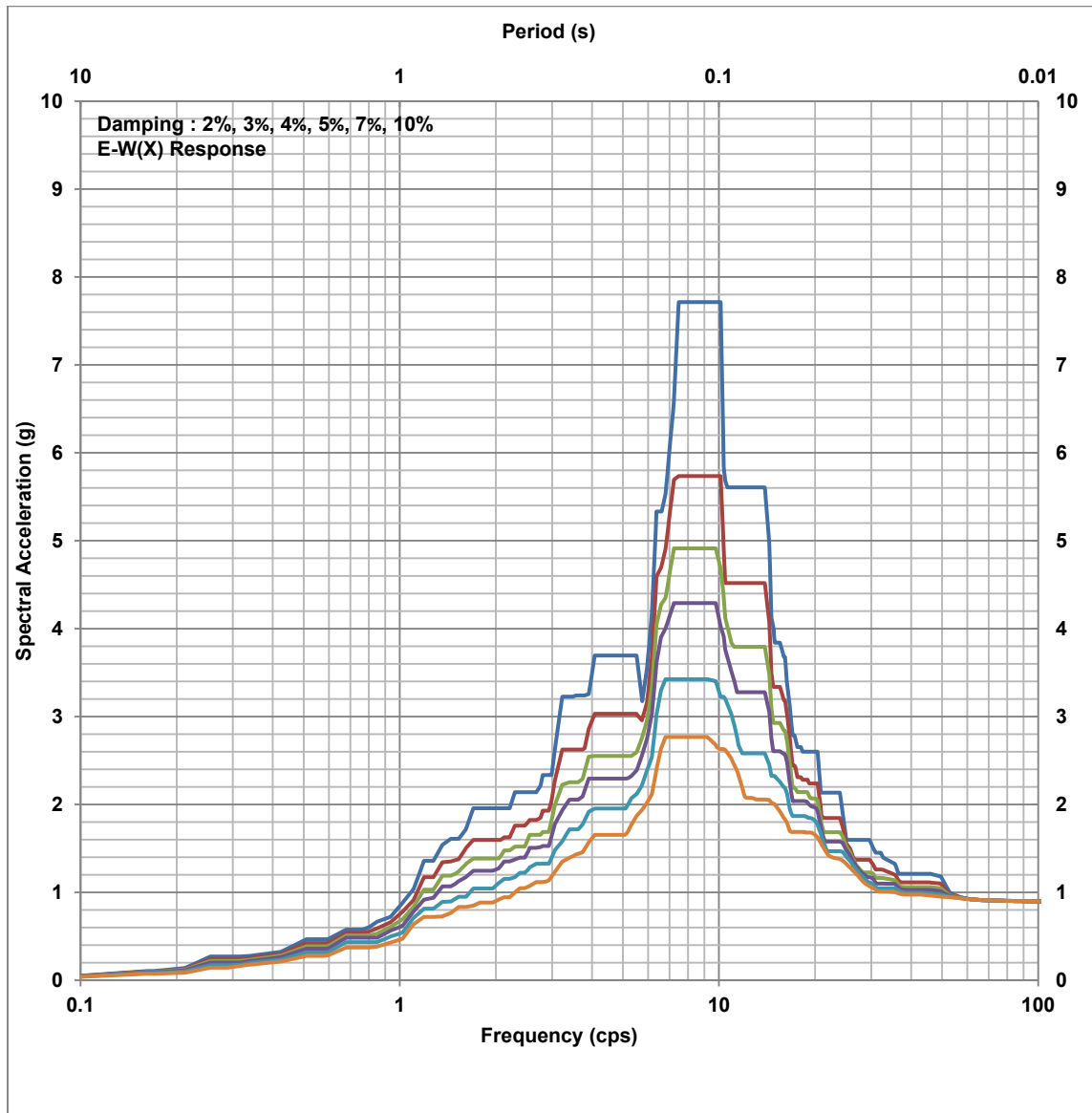


Figure 3.7A-82 Enveloped ISRS for SSE, Emergency Diesel Generator Building at EL.135'-0", E-W, Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

APR1400 DCD TIER 2

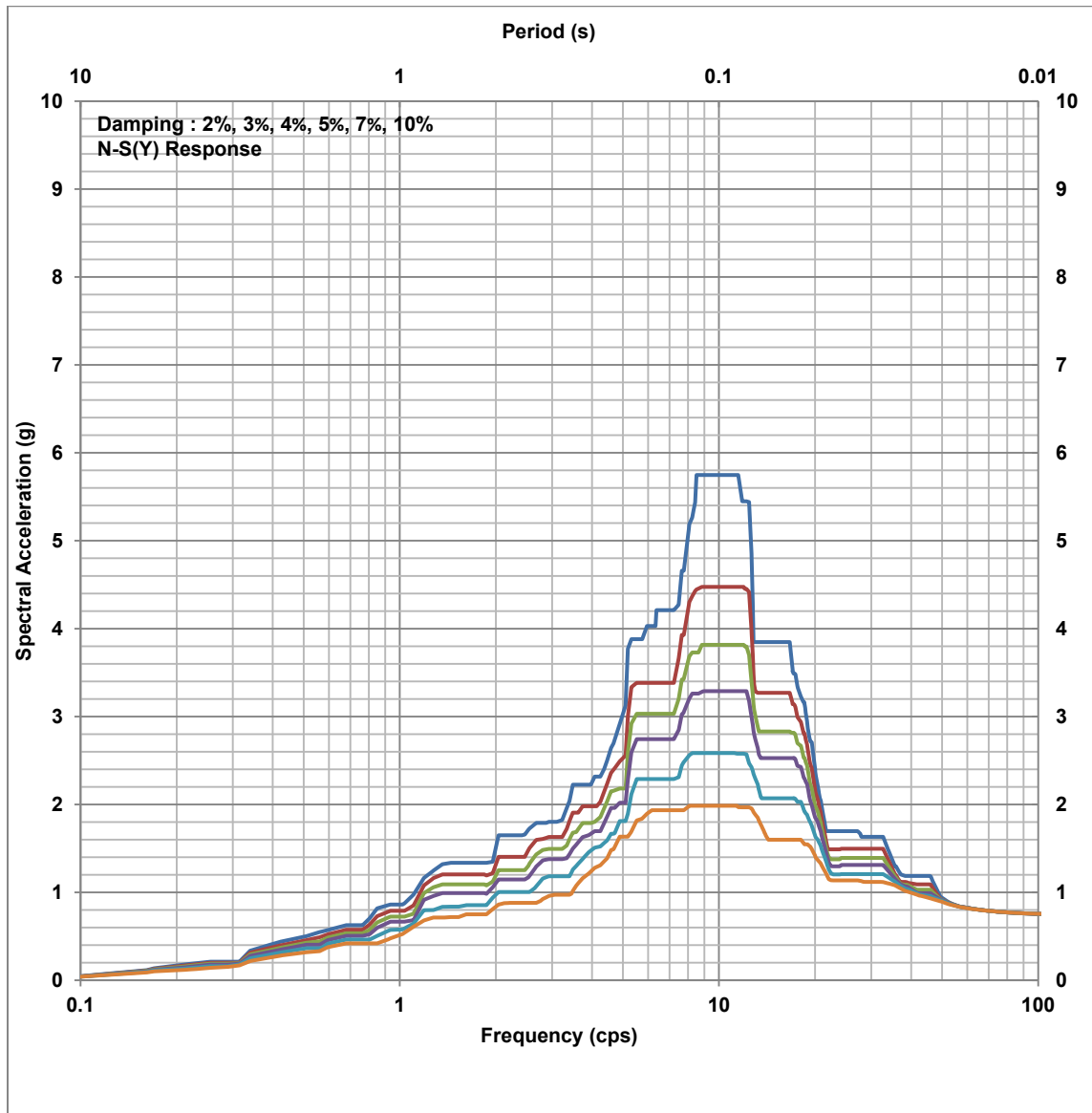


Figure 3.7A-83 Enveloped ISRS for SSE, Emergency Diesel Generator Building at EL.135'-0", N-S, Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

APR1400 DCD TIER 2

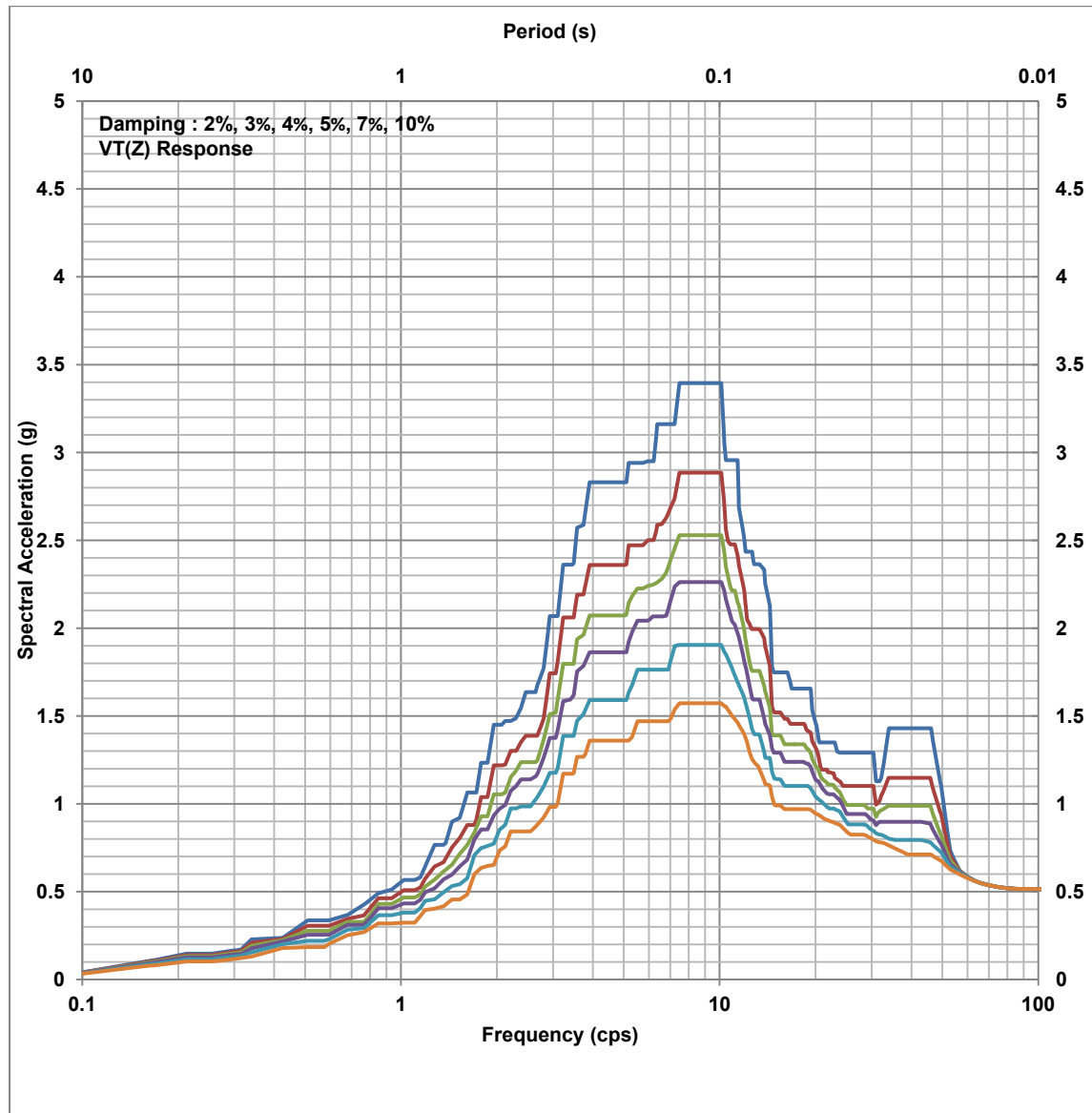


Figure 3.7A-84 Enveloped ISRS for SSE, Emergency Diesel Generator Building at EL.135'-0", Vertical, Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

APR1400 DCD TIER 2

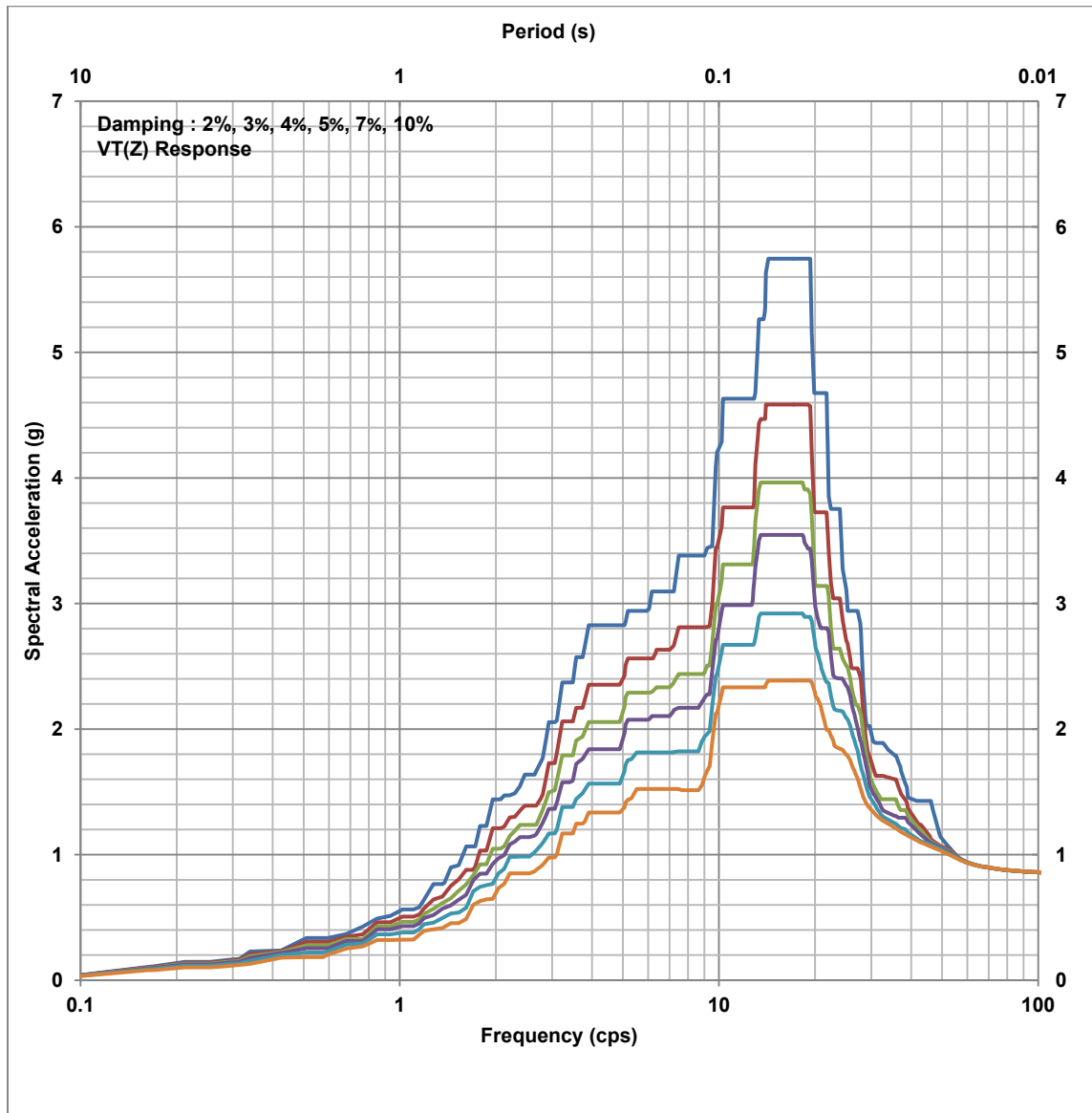


Figure 3.7A-85 Enveloped ISRS for SSE, Emergency Diesel Generator Building at EL.135'-0" (Slab), Vertical, Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

APR1400 DCD TIER 2

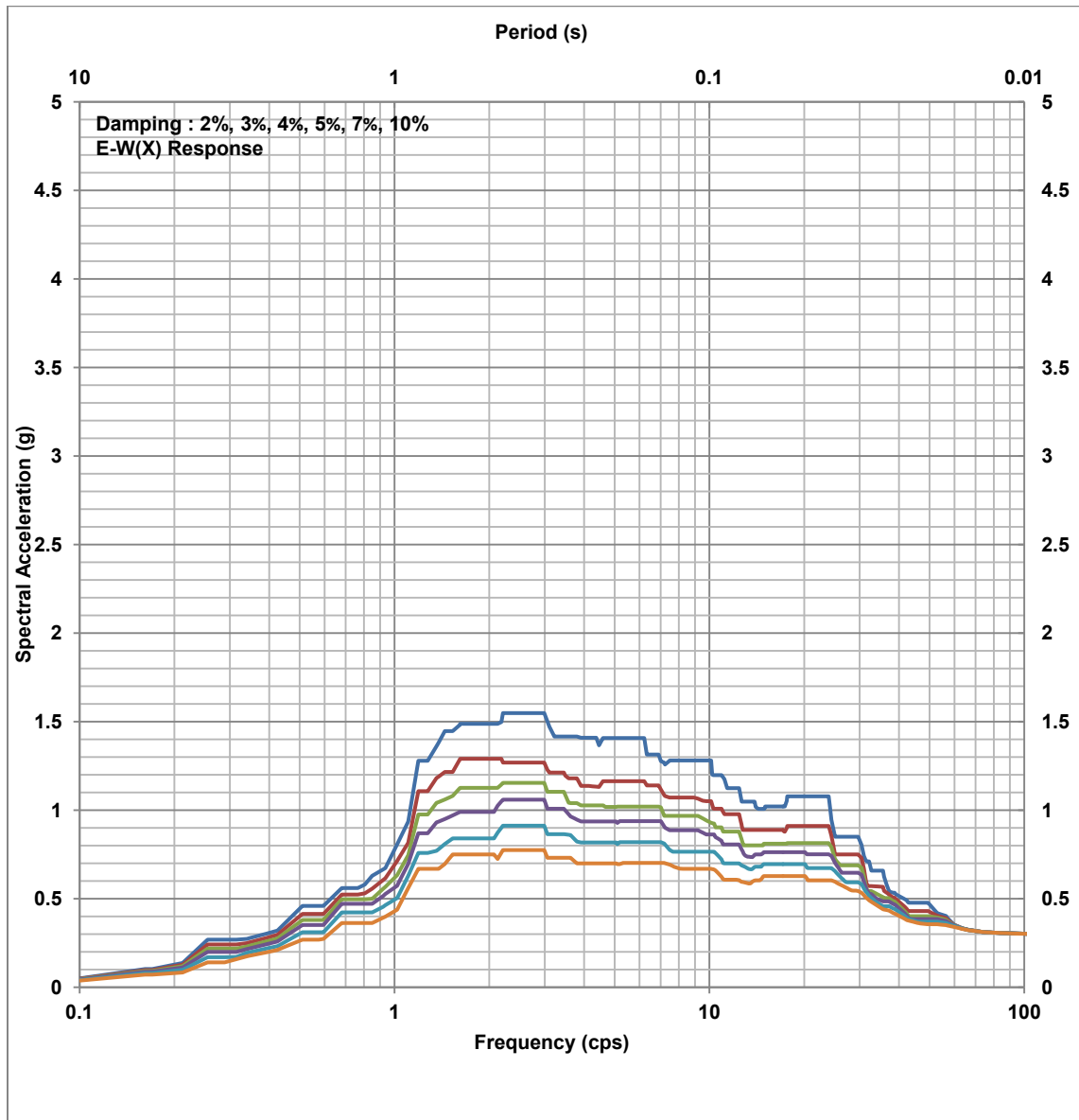


Figure 3.7A-86 Enveloped ISRS for SSE, Diesel Fuel Oil Storage Tank Room at EL.63'-0", E-W, Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

APR1400 DCD TIER 2

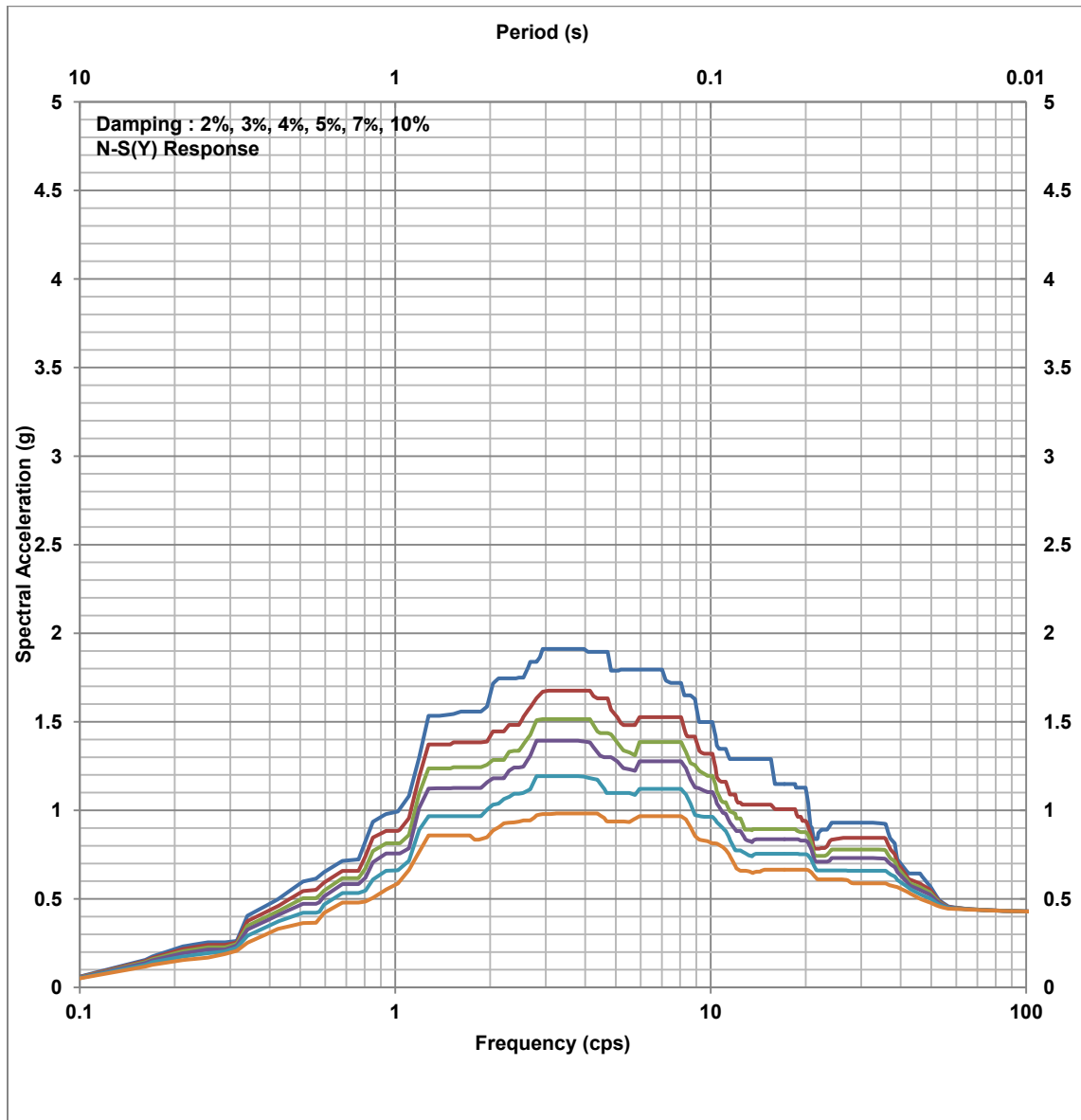


Figure 3.7A-87 Enveloped ISRS for SSE, Diesel Fuel Oil Storage Tank Room
at EL.63'-0", N-S, Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

APR1400 DCD TIER 2

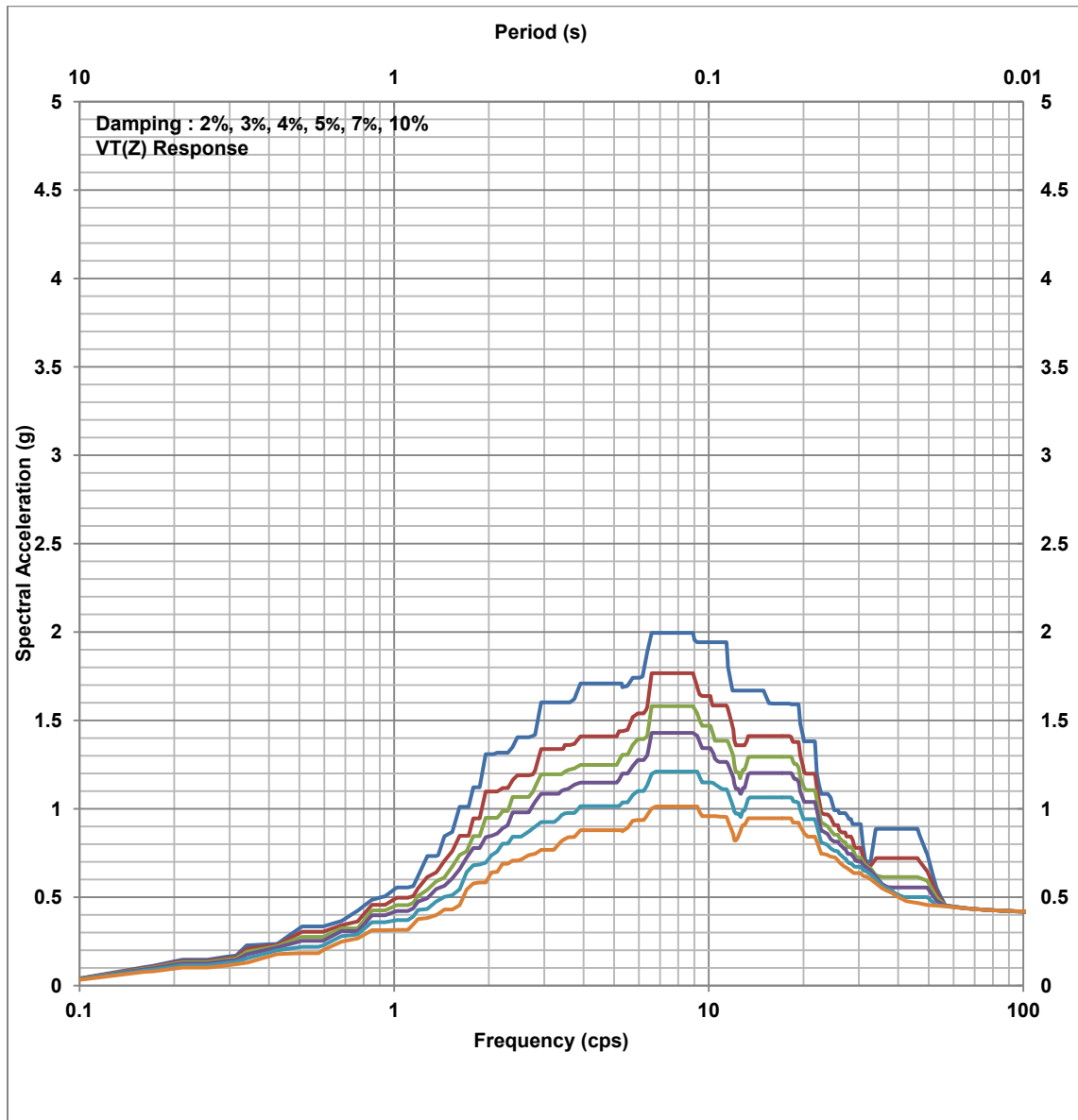


Figure 3.7A-88 Enveloped ISRS for SSE, Diesel Fuel Oil Storage Tank Room at EL.63'-0", Vertical, Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

APR1400 DCD TIER 2

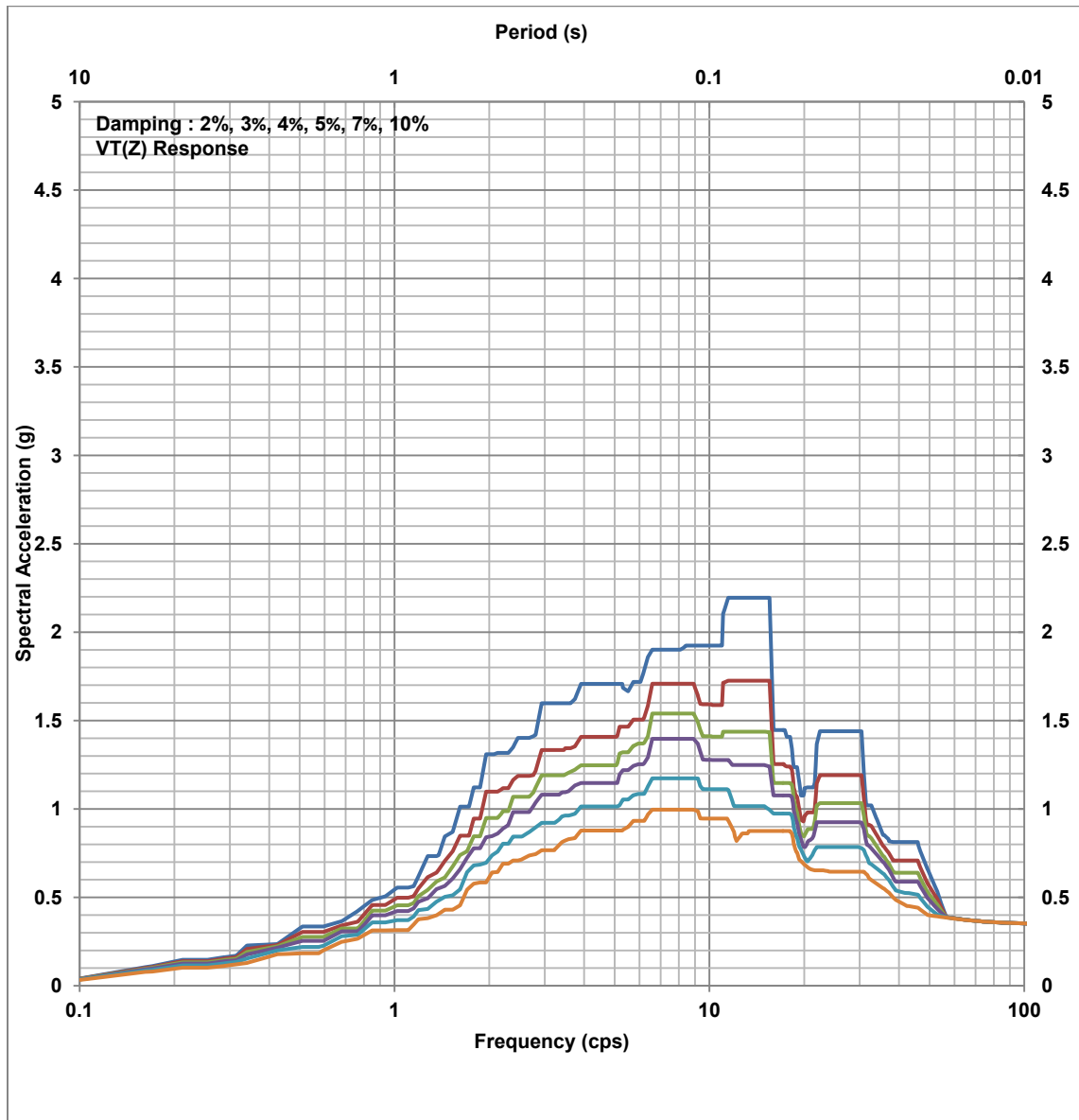


Figure 3.7A-89 Enveloped ISRS for SSE, Diesel Fuel Oil Storage Tank Room at EL.63'-0" (Slab), Vertical, Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

APR1400 DCD TIER 2

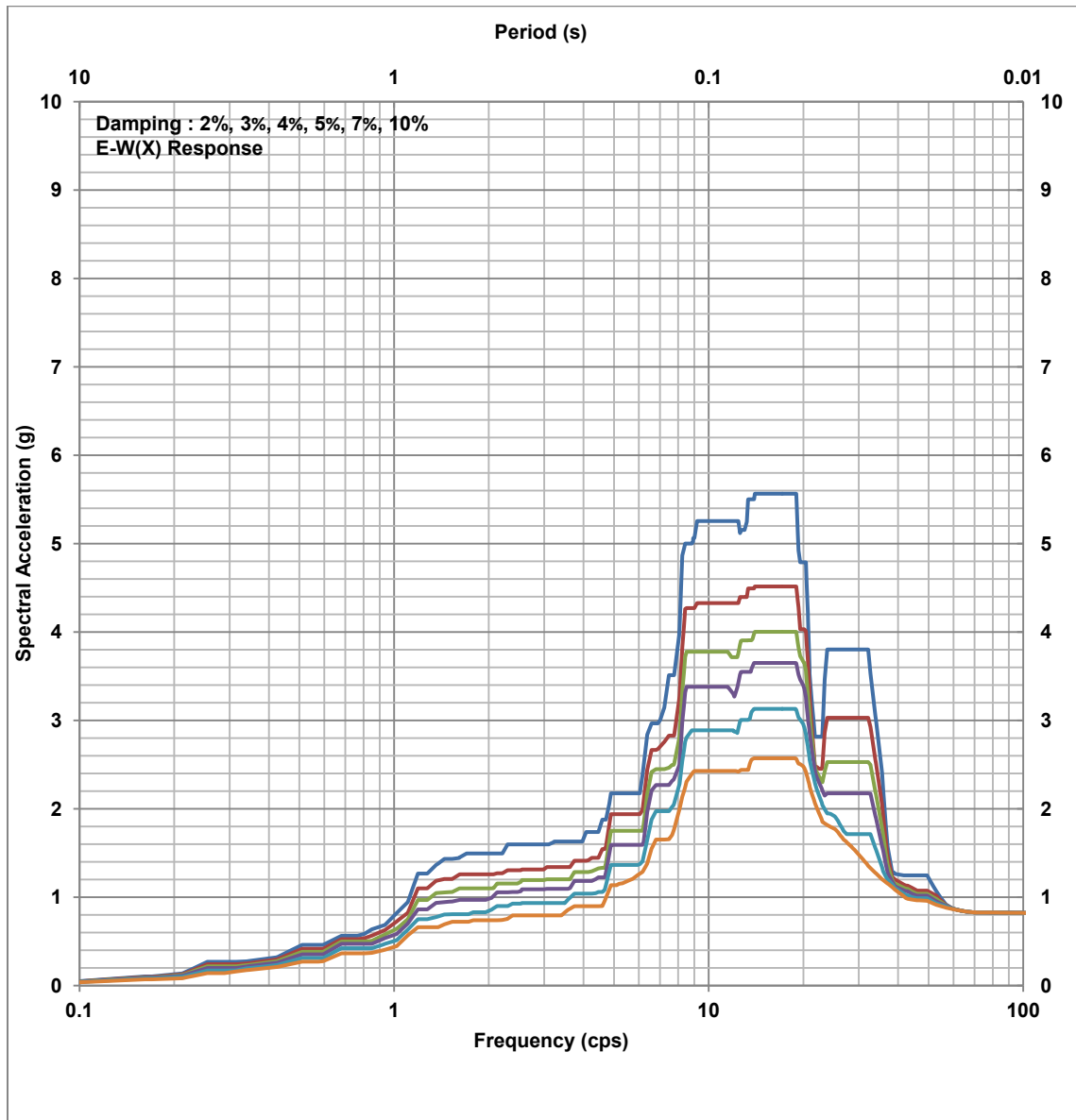


Figure 3.7A-90 Enveloped ISRS for SSE, Diesel Fuel Oil Storage Tank Room
at EL.100'-0", E-W, Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

APR1400 DCD TIER 2

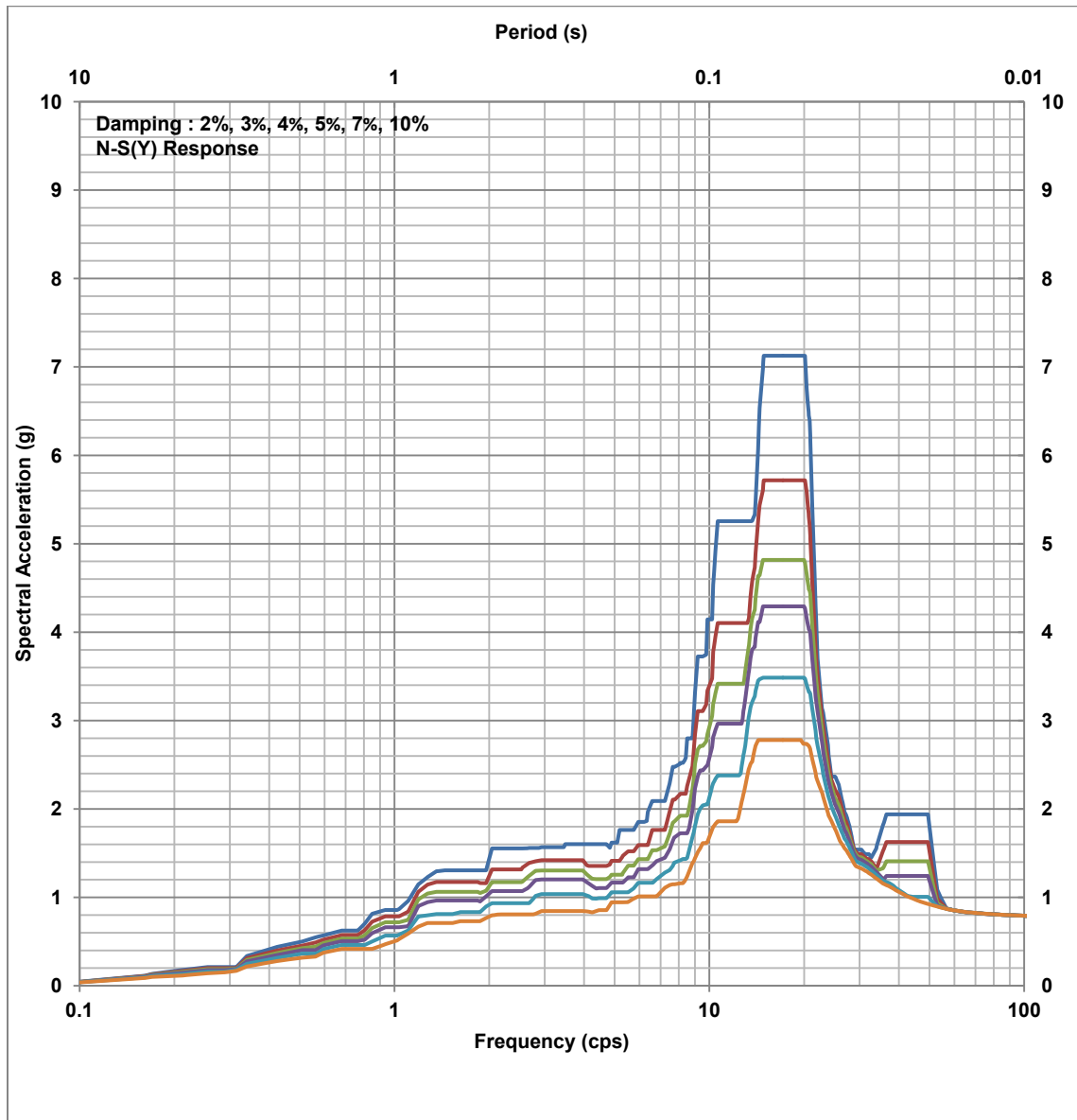


Figure 3.7A-91 Enveloped ISRS for SSE, Diesel Fuel Oil Storage Tank Room at EL.100'-0", N-S, Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

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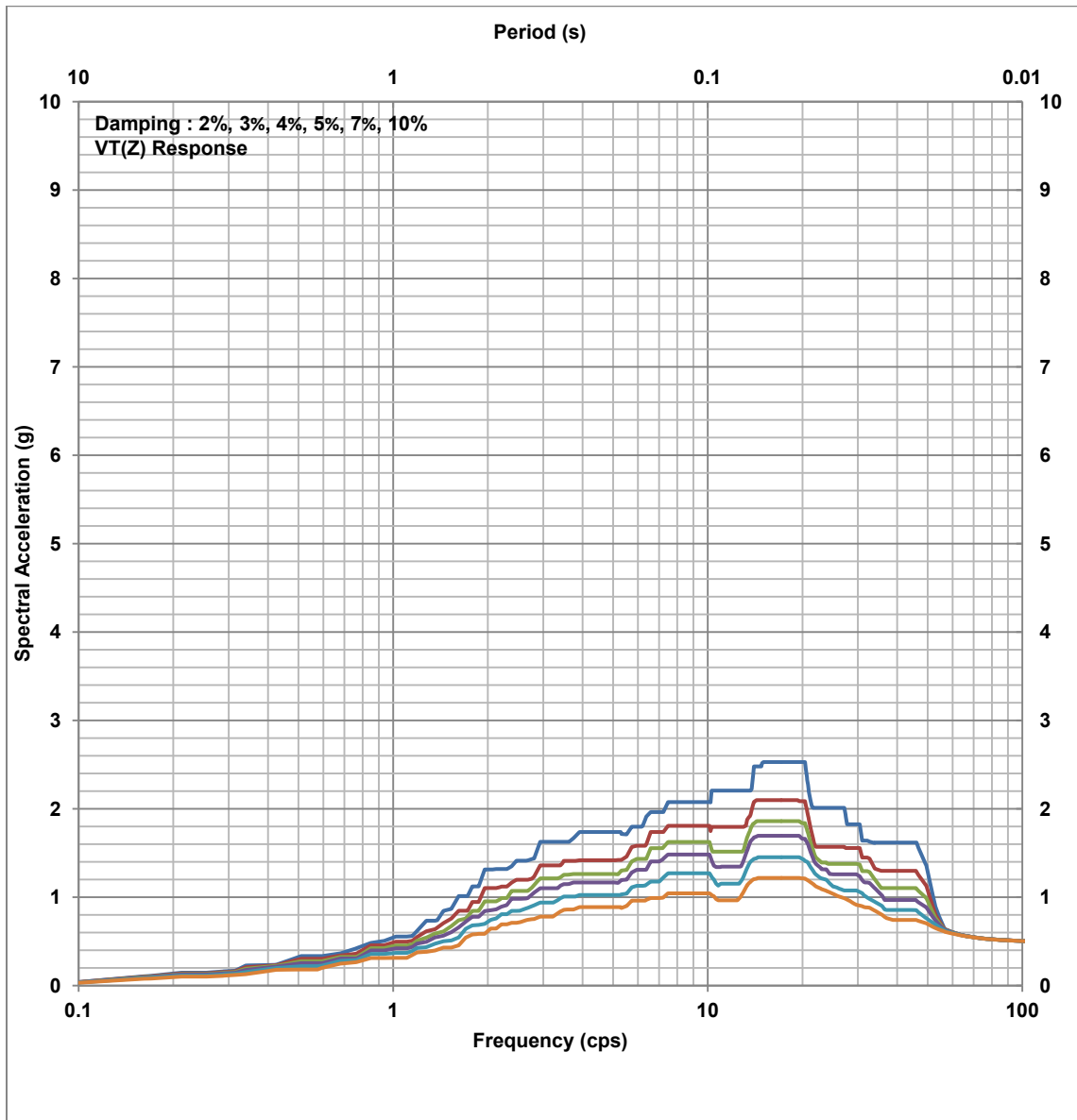


Figure 3.7A-92 Enveloped ISRS for SSE, Diesel Fuel Oil Storage Tank Room at EL.100'-0", Vertical, Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

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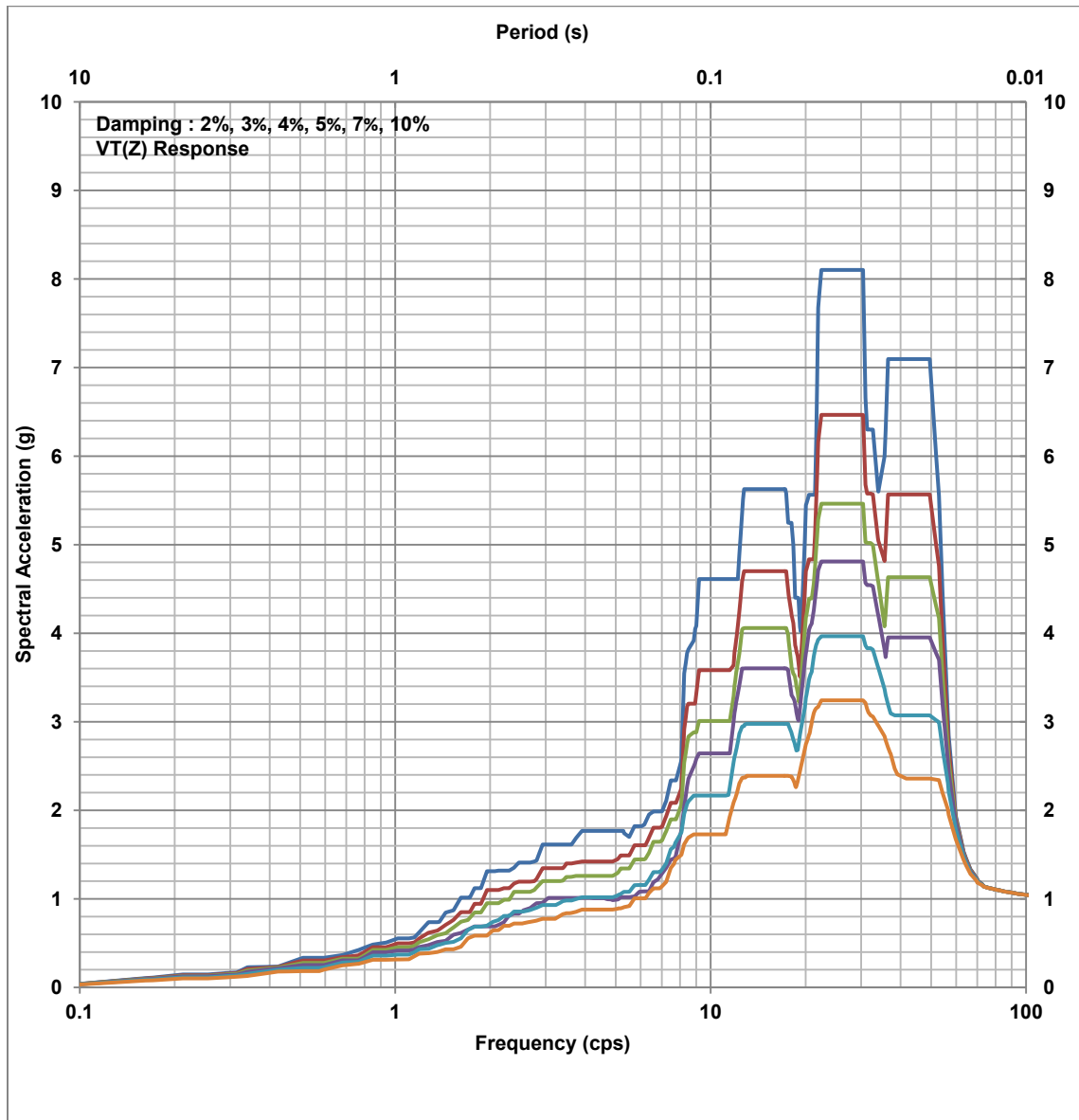


Figure 3.7A-93 Enveloped ISRS for SSE, Diesel Fuel Oil Storage Tank Room at EL.100'-0" (Slab), Vertical, Damping Ratio 2%, 3%, 4%, 5%, 7%, 10%

APPENDIX 3.7B

EVALUATION FOR HIGH FREQUENCY SEISMIC INPUT

APPENDIX 3.7B – EVALUATION FOR HIGH FREQUENCY SEISMIC INPUT

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