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MAR 24 1980

MEMORANDUM FOR: Pao-Tsin Kuo, Section Leader  
Seismic Review Group, DOR

FROM: Robert E. Jackson, Chief  
Geosciences Branch, DSS

SUBJECT: SEISMIC REVIEW OF OPERATING PLANTS

As you requested, we have conducted a preliminary evaluation of the Safe Shutdown Earthquake at operating plant sites based on recent relevant licensing decisions and Standard Review Plan procedures. The acceleration values in the enclosed table should be considered as reference values to be used with the Regulatory Guide 1.60 spectrum. These values are estimates SSE ranges that could be made based on judgement of the staff and do not represent a staff position. To establish a specific anchor value will require detailed analysis of each site. These design spectra may not account for local site or foundation spectra of strong motion records. Site specific response spectra can also be developed from response spectra of strong motion records. This approach was recently used in the Sequoyah OL review. We have also indicated significant seismic, geologic, and geotechnical engineering concerns at each site. In some cases consideration of these concerns could affect specification of the Safe Shutdown Earthquake.

This review was prepared by Phyllis Sobel, Geophysicist, with help from Leon Reiter, Geology and Seismology Section Leader, Anthony Cardone, Geologist, Harold Lefevre, Geologist, Richard Mcullen, Geologist, Sandra Mastler, Geologist, Lyman Heller, Geotechnical Engineering Section Leader, Joe Kane, Geotechnical Engineer, and John Greeves, Geotechnical Engineer.

Original Signed by  
R. E. Jackson  
Robert E. Jackson, Chief  
Geosciences Branch  
Division of Systems Safety

Enclosure:  
As stated

cc: w/enclosure  
J. Knight  
R. Jackson  
L. Shao  
GSB Staff

*RTD 16-6*

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DATE	3/24/80				

ESTIMATED POSSIBLE SSE RANGES FOR OPERATING PLANTS BASED ON RECENT  
STAFF LICENSING DECISIONS

<u>Name of Plant</u>	<u>Tectonic Province</u>	<u>SSE</u>		<u>Seismologic, Geologic and Geotechnical Engineering Concerns</u>
		<u>Intensity (MM)</u>	<u>"g" value</u>	
Arkansas	Central Stable Region (CSR)	VII to VII-VIII	.13 -.20	Effect of Mississippi Embayment seismicity
Beaver Valley	Appalachian Plateau	VI-VII to VII	.10-.13	Liquefaction
Big Rock Point	CSR	VI-VII to VII-VIII	.10-.20	Possible solution cavity
Browns Ferry	CSR	VII to VII-VIII	.13-.20	Effect of Mississippi Embayment seismicity
Brunswick	Atlantic Coastal Plain (ACP)	VII	.13	Effect of Charleston seismicity
Calvert Cliffs	ACP	VII	.13	
Cooper	CSR	VII to VIII	.13-.25	Effect of Nemaha Uplift seismicity
Crystal River	Gulf Coastal Plain (GCP)	VI to VII	.10-.13	Solution cavities
Davis-Besse	CSR	VII-VIII	.20	Effects of Findlay Arch and Anna, Ohio seismicity
Donald C. Cook	CSR	VI-VII to VII-VIII	.10-.20	
Dresden	CSR	VII-VIII	.20	Leaky dike-failed once
Duane Arnold	CSR	VII to VII-VIII	.13-.20	Solution cavities
Edwin I. Hatch	ACP	VII	.13	Effect of Charleston seismicity; resolve tech. spec. on settlement

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<u>Name of Plant</u>	<u>Tectonic Province</u>	<u>SSE</u>		<u>Seismologic, Geologic and Geotechnical Engineering Concerns</u>
		<u>Intensity (MM)</u>	<u>"g" value</u>	
Fort Calhoun	CSR	VII to VIII	.13-.25	Effects of seismicity associated with Midcontinent Geophysical Anomaly and Nemaha Uplift; Thurman-Wilson Fault; pile foundation; liquefaction
Fort St. Vrain	CSR	VII to VII-VIII	.13-.20	Near Western margin of tectonic province
Haddam Neck	New England Piedmont (NEP)	VII to VII-VIII	.13-.20	Effect of seismicity near East Haddam; Honey Hill fault
H. B. Robinson	ACP	VII	.13	Effect of Charleston seismicity
Humboldt Bay	N/A			Soil amplification of ground motion; Little Salmon fault and other faults; amount of fault offset; currently under review
Indian Point	NEP	VII to VII-VIII	.13-.20	Ramapo fault
James A. Fitzpatrick	CSR	VII to VII-VIII	.13-.20	Effect of St. Lawrence seismicity; glacial effects on faults; lateral squeeze
Joseph M. Farley	GCP	VI to VII	.10-.13	Check dams
Kewaunee	CSR	VII to VII-VIII	.13-.20	
LaCrosse	CSR	VII to VII-VIII	.13-.20	Liquefaction
Maine Yankee	NEP	VII to VIII	.13-.25	Effect of Boston-Cape Ann seismicity
Millstone	NEP	VII to VII-VIII	.13-.20	Effect of Boston-Cape Ann and East Haddam seismicity

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Name of Plant	Tectonic Province	SSE		Seismologic, Geologic and Geotechnical Engineering Concerns
		Intensity (MM)	"g" value	
Monticello	CSR	VII to VII-VIII	.13-.20	Effect of Midcontinent Geophysical Anomaly seismicity
Nine Mile Point	CSR	VII to VII-VIII	.13-.20	Effect of St. Lawrence seismicity; glacial effects on faults; lateral squeeze
North Anna	NEP	VII	.13	
Oconee	NEP	VII to VII-VIII	.13-.20	Reservoir induced seismicity at Jocassee and Keweenaw; Jocassee dam; effect of Charleston seismicity
Oyster Creek	ACP	VII	.13	
Palisades	CSR	VI-VII to VII-VIII	.10-.20	
Peach Bottom	NEP	VII	.13	
Pilgrim	NEP	VII to VII-VIII	.13-.20	Effect of Boston-Cape Ann seismicity
Point Beach	CSR	VII to VII-VIII	.13-.20	
Prairie Island	CSR	VII to VII-VIII	.13-.20	
Quad-Cities	CSR	VII to VII-VIII	.13-.20	Solution cavities-migration off site
Rancho Seco	N/A			Foothills fault; currently under review
Robert E. Ginna	CSR	VII to VII-VIII	.13-.20	Clarendon Linden fault

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<u>Name of Plant</u>	<u>Tectonic Province</u>	<u>SSE</u>		<u>Seismologic, Geologic and Geotechnical Engineering Concerns</u>
		<u>Intensity (MM)</u>	<u>"g" value</u>	
Salem	ACP	VII	.13	Liquefaction on pipelines
San Onofre 1	N/A			Unit 1 under review; current OL review for units 2 and 3
Shippingport Atomic Power Station	Appalachian Plateau	VI-VII to VII	.10-.13	Poor foundations
St. Lucie	ACP	VI to VII	.10-.13	Integrity of soil slopes in canals.
Surry	ACP	VII	.13	
Three Mile Island	NEP	VII	.13	Repair of river screen house slopes; Dike repairs.
Trojan	N/A	VIII	.25	
Turkey Point	ACP	VI to VII	.10-.13	Possible solutioning
Vermont Yankee	NEP	VII to VIII	.13-.25	Effect of Boston-Ottawa seismic zone
Yankee-Rowe	NEP	VII to VII-VIII	.13-.20	Effect of Boston-Ottawa seismic zone; upstream and on-site dams
Zion	CSR	VII-VIII	.20	

Note - These g-values are the anchor points for Regulatory Guide 1.60 spectra.