



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
Rockville, Md. 20852
ENVIRONMENTAL RESEARCH LABORATORIES

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Regulatory

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Reply to
Attn of: R1030
809.82

Mr. L. Manning Muntzing
Director of Regulation
U. S. Atomic Energy Commission
Washington, D. C. 20545



Dear Mr. Muntzing:

In accordance with your request, we are forwarding 10 copies of our report on the seismicity of the Watts Bar Nuclear Plant Units 1 and 2 in Rhea County, Tennessee.

If we may be of further assistance to you, please contact us.

Sincerely,

Leonard M. Murphy
Leonard M. Murphy
Director, Seismological
Investigations Group

Enclosure



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REPORT ON THE SITE SEISMICITY
FOR THE WATTS BAR NUCLEAR
PLANT UNITS 1 & 2

Approved w/lt. Date: 7-10-72

At the request of the Division of Reactor Licensing of the Atomic Energy Commission, the Seismological Investigations Group, NOAA, has evaluated the seismicity of the area around the proposed Watts Bar Nuclear Plant Units 1 & 2 adjacent to the TVA Watts Bar Dam Reservation in Rhea County, Tennessee. The Group has reviewed a similar evaluation submitted to AEC by the Tennessee Valley Authority in its Preliminary Safety Analysis Report and Amendments.

The historical seismic activity considered to have an effect on this site evaluation is the intensity VII (MM) earthquakes that have occurred in the southern half of the Ridge and Valley Province, the intensity VIII (-) (MM) earthquake in Giles County, Virginia, the 1811-1812 series of very large earthquakes near New Madrid, Mo., and the numerous smaller events near Chattanooga, Tenn., and elsewhere in the Appalachian Mountains.

The U. S. Geological Survey report on this site states, "The regional structural setting is mainly one of imbricate thrust faulting and minor folding involving generally southeasterly dipping lower Paleozoic rocks. The northeasterly trending Kingston thrust fault parallels the attitude of the

beds and reaches the surface about 1 mile northwest of the site. There is no evidence that thrust faults, under either the Cumberland Plateau or the Valley and Ridge Province, have been active since Paleozoic time."

The geological report continues, "There are no known active faults or other major geologic structure in the area that are thought potentially capable of localizing seismicity in the immediate vicinity of the site."

However, the southern half of the Ridge and Valley Province has experienced earthquake activity throughout the time that historical records have been maintained. The largest event in this region was the Giles County earthquake of May 31, 1897, during which some structural damage (listed as intensity VIII) occurred. Also, there have been three intensity VII events; the January 27-28, 1905, activity near Gadston, Alabama; the March 28, 1913, Knoxville, Tennessee, earthquake; and the October 18, 1916 earthquake near Birmingham, Alabama. In addition, more than 60 earthquakes with intensities from III to VI have occurred with epicenters throughout the Province.

Since the seismic activity in this region cannot be associated with specific structures, it must be assumed that earthquakes with intensities comparable with those characteristics of the southern half of the Ridge and Valley Province might also occur in the vicinity of the plant site.

While the major events of the New Madrid, Mo., and

Charleston, S. C., area were probably felt at the proposed plant site, a repeat of these events is considered to be less of a hazard than the events occurring within the Ridge and Valley Province. The site evaluation and recommendation of acceleration values are premised by the fact that the applicant proposes to locate all Class 1 buildings on unweathered Conasauga shale bedrock.

As a result of this review of the seismological and geological characteristics of the area around the proposed plant site, the Seismological Investigations Group agrees with the applicant that an acceleration of 0.09g, resulting from an intensity VII earthquake, would be adequate for representing the earthquake disturbance likely to occur within the lifetime of the facility. The Group also agrees with the applicant that an acceleration of 0.18g, resulting from an intensity VIII earthquake, would be adequate for representing the ground motion from the maximum earthquake likely to affect the site. It is believed that these values would be adequate for designing protection against the loss of function of components important to safety.

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