

NORTHERN KENTUCKY EARTHQUAKE - ADDENDA

Excerpts from a Site Visit to Zimmer Nuclear Plant  
Near Moscow, Ohio (Cincinnati Gas and Electric Co.)

[Jeff Kimball, Seismologist, Geosciences Branch, Nuclear Regulatory Commission, visited the William H. Zimmer Nuclear Power Station and the earthquake damage area of the July 27, 1980 shock. The epicenter was approximately 40 miles south-southeast of the plant. The plant is in the Post-Construction Permit state of licensing, so neither it nor its seismic monitoring equipment is yet operating. A detailed report of site effects at Zimmer will presumably be available as part of Docket 50-358. The following paragraphs are abstracted from Kimball's trip report, dated August 6, 1980.]

The purpose of the visit was to assess the effects of this event on the plant site and to survey damage in the epicentral area.

Site Visit with Zimmer Applicant

On July 29 I visited the Zimmer power plant site in Moscow, Ohio and met with Pat Gwynn, the assistant resident inspector. Discussion items included:

1. The felt effects of the earthquake at the site. Because the plant is under construction, only a few people were on the site that Sunday afternoon. Two people were in the control room, with only one feeling the shaking. This person estimated the duration to be about 20 seconds. The only others questioned so far are two guards - one on the 627 level of the reactor containment building, the other in a guard shack on the plant grounds. The guard on the 627 level reported that objects around him bounced on the floor (desk, chair) and that the polar crane was "bouncing" on its track. The man in the guard house estimated duration at about 20 seconds and noted that a 100-150 pound badge rack moved along the floor to the south. This preliminary information suggests that the intensity at the site is in the range of Modified Mercalli (MM) intensity V to VI.

2. Inspection took place both on Sunday and Monday. Tom Daniels, the resident inspector at the site, checked the reactor containment building immediately after the earthquake and, in particular, found that no movement had taken place in the refueling bridge. He raised questions about other areas he checked, such as small cracks found in cinderblocks, how to tell if they were caused by earthquake, and how to check things such as the surface water building intake.

3. The seismic monitoring devices were not operational at the time of the earthquake because the plant is still under construction. [Editor's underline.]

The applicant asked that the NRC formally request information and action on the effects of the earthquake at the site. The Zimmer site is designed for a Safe Shutdown Earthquake of MM intensity VII-VIII at the site, while the Operating Basis Earthquake is MM intensity VI at the site. From the preliminary analysis one can see that the felt effects, by the few people who were at the site, indicate that shaking may have approached (or may well have been) that expected for the OBE. If the seismic monitoring devices had been operational, the information gained would be some of the best recorded at a plant site. Intensity-attenuation relationships (intensity falloff with distance) for the Central United States were also used to derive an intensity at the site. These calculations confirmed that a MM intensity as high as VI could be expected for an earthquake occurring with  $M = 5.1$  at a distance of 40 miles.