



UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D. C. 20555-0001

MAR 16 1994

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MEMORANDUM FOR:

Jack E. Rosenthal, Chief
Reactor Operations Analysis Branch
Division of Safety Programs
Office for Analysis and Evaluation
of Operational Data

FROM:

Mary S. Wegner
Reactor Systems Engineer
Engineering Section
Reactor Operations Analysis Branch
Division of Safety Programs
Office for Analysis and Evaluation
of Operational Data

SUBJECT:

THE ELECTRICAL TRANSIENT WHICH FOLLOWED THE LOS
ANGELES EARTHQUAKE - JANUARY 17, 1994

The enclosed Technical Review Report discusses the electrical transient which occurred throughout the western United States following the Los Angeles earthquake.

At 7:31 a.m. EST, January 17, 1994, an earthquake which measured 6.6 on the Richter scale struck southern California. At that time and for that reason, the grid in the western states began to separate. Transmission lines tripped and power plants tripped or ran back in Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.

The Western Systems Coordinating Council (WSCC) bulk transmission system (the grid) separated into north and south islands. Diablo Canyon, in the north island, experienced a minimum frequency of 59.03 Hz and frequency below 59.83 Hz for 20 minutes when the southern intertie, Midway-Vincent #1, #2, and #3, tripped. WNP-2 was also in the north island. Operating nuclear plants in the south island were San Onofre and Palo Verde.

The performance of the WSCC grid was within the emergency operating criteria with the possible exception of the blackouts in Idaho.

Events after the Los Angeles earthquake suggest a similarity between severe weather and earthquake-related LOOPS not due to direct seismic effects. The estimated frequency for an earthquake-related LOOP ranges from higher than that of sites with known grid reliability problems and low to moderate severe-weather hazards to higher than that of sites located in a high severe-weather hazard area, depending on the duration of the LOOP.

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At the present time, offsite power to a nuclear plant has not been lost because of the frequency swings, but the potential exists. It should be recognized that this kind of event should not be limited to the WSCC because interactions between other Reliability Council member units can and do occur.

Original signed by

Mary S. Wegner
Reactor Systems Engineer
Engineering Section
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Office for Analysis and Evaluation
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Enclosure: As stated

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Jack E. Rosenthal

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