

Southern California Edison Company

P. O. BOX 800

2244 WALNUT GROVE AVENUE

ROSEMEAD, CALIFORNIA 91770

April 30, 1979

J. T. HEAD, JR.
VICE PRESIDENT

TELEPHONE
213-572-1472

U. S. Nuclear Regulatory Commission
Office of Inspection and Enforcement
Region V
Suite 202, Walnut Creek Plaza
1990 N. California Boulevard
Walnut Creek, California 94596



Attention: Mr. R. H. Engelken, Director

Docket No. 50-206
San Onofre Unit 1

- References: (1) IE Bulletin No. 79-07 dated April 14, 1979
"Seismic Stress Analysis of Safety-Related Piping"
- (2) Southern California Edison Company letter dated April 24, 1979;
J. T. Head, Jr. (Vice President) to R. H. Engelken
(Director, Region V)

Reference (1) requested that we submit information in order to permit a determination of whether piping systems important to safety have been designed using piping analysis computer codes which contain algebraic summation errors. Reference (2) indicated that we did not believe that any computer codes containing algebraic summation errors have been used in the design and for analyses of San Onofre Unit 1, and that we would confirm this as well as provide additional information concerning benchmark problems and verification analyses by April 30, 1979.

Accordingly, our response to each item of Reference (1) is contained in the enclosed report entitled "Responses to IE Bulletin No. 79-07, San Onofre Nuclear Generating Station, Unit 1, April, 1979".

281 222

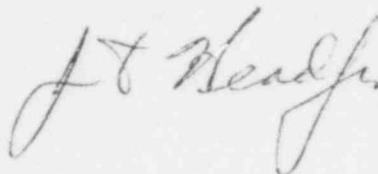
281 228

7907050 442 Q



Should you require additional information concerning the enclosed material, please let me know.

Very truly yours,



Enclosures

cc: Director, Office of Inspection and Enforcement

RESPONSES TO IE BULLETIN NO. 79-07

SAN ONOFRE NUCLEAR GENERATING STATION
UNIT 1

April, 1979

281 230

INFORMATION REQUEST
ITEM (1)

Identify which, if any, of the methods specified below were employed or were used in computer codes for the seismic analysis of safety related piping in your plant and provide a list of safety systems (or portions thereof) affected:

Response Spectrum Model Analysis:

- a. Algebraic (considering signs) summation of the codirectional spatial components (i.e., algebraic summation of the maximum values of the codirectional responses caused by each of the components of earthquake motion at a particular point in the mathematical model).
- b. Algebraic (considering signs) summation of the codirectional inter-modal responses (i.e., for the number of modes considered, the maximum values of response for each mode summed algebraically).

Time History Analysis:

- a. Algebraic summation of the codirectional maximum responses or the time dependent responses due to each of the components of earthquake motion acting simultaneously when the earthquake directional motions are not statistically independent.

RESPONSE

A review of computer codes utilized in the seismic analysis of safety related piping, including modifications and additions to such piping at San Onofre Unit 1 has concluded that none of the methods specified above have been utilized. A review of seismic analyses not utilizing computer codes is being completed to verify the same conclusion for such analyses.

INFORMATION REQUEST
ITEM (2)

Provide complete computer program listings for the dynamic response analysis portions for the codes which employed the techniques identified in Item 1 above.

RESPONSE

Not applicable.

INFORMATION REQUEST
ITEM (2)

Verify that all piping computer programs were checked against either piping benchmark problems or compared to other piping computer programs. You are requested to identify the benchmark problems and/or the computer programs that were used for such verifications or describe in detail how it was determined that these programs yielded appropriate results (i.e., gave results which corresponded to the correct performance of their intended methodology).

RESPONSE

The computer codes which have been utilized in the seismic analysis of safety related piping, including modifications and additions to such piping at San Onofre Unit 1 are as follows:

WECAN - Westinghouse Electric Corporation Proprietary Program

ME 632- Seismic Analysis of Piping Systems, Bechtel Power Corporation

ME 101- LEAP: Linear Elastic Analysis of Pipe, Bechtel Power Corporation

SAP IV- A Structural Analysis Program for Static and Dynamic Response of Linear Systems

Verification of the WECAN computer code is documented in the Westinghouse report "Benchmark Problem Solutions Employed for Verification of the WECAN Computer Program", WCAP-8929, April 1977, which has been submitted to the NRC. ME 632 has been verified using PISOL, PIPESD and TPIPE. ME 101 has been verified using ME 632, TPIPE and SUPERPIPE. SAP IV was originally benchmarked by its author (E. L. Wilson, et. al.). Sample problems were compared with results obtained from ADLPIPE for static analysis of a pipe network and PIPDYN for dynamic response spectrum analysis of a pipe network.

INFORMATION REQUEST
ITEM (4)

If any of the methods listed in item 1 are identified, submit a plan of action and an estimated schedule for the re-evaluation of the safety related piping, supports, and equipment affected by these analysis techniques. Also provide an estimate of the degree to which the capability of the plant to safely withstand a seismic event in the interim is impacted.

RESPONSE

Not applicable.