

Central File

Southern California Edison Company



P. O. BOX 800
2244 WALNUT GROVE AVENUE
ROSEMEAD, CALIFORNIA 91770

K. P. BASKIN
MANAGER, GENERATION ENGINEERING

November 6, 1979

TELEPHONE
213-572-1401

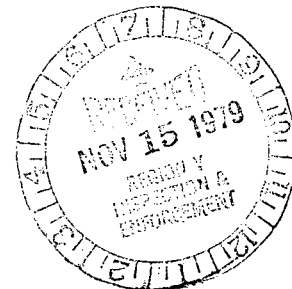
Docket Nos. 50-361, 50-362

U. S. Nuclear Regulatory Commission
Region V
Suite 202, Walnut Creek Plaza
1990 N. California Boulevard
Walnut Creek, California 95696

Attention: Mr. R. H. Engelken

Gentlemen:

Subject: IE Bulletin 79-14, et al
San Onofre Nuclear Generating Station
Units 2 and 3



Your letters of July 2, 1979, July 18, 1979, July 19, 1979, August 15, 1979 and September 7, 1979 forward IE Bulletin 79-14, "Seismic Analysis for As-Built Safety Related Piping Systems", and its various supplements and corrected copies which require a review of as-built safety related piping to verify that seismic analyses are applicable to as-built conditions.

Our A/E (Bechtel Power Corporation) has reviewed current project procedures for the design, installation, and inspection of safety related piping with an emphasis on assurance that as-built conditions are reviewed for compatibility with initial design basis input. However, in most cases the stipulated requirements are premature for San Onofre Units 2 and 3 since few of the piping system installations are entirely complete and turned over to Startup. As such, the attached response addresses the current project inspection and review procedures utilized to provide adequate controls to substantiate the validity of the seismic analysis of all safety related piping systems from the standpoint of compatibility between the design basis input used in analysis and the as-built configuration of the piping system. The completion date for such inspections would be consistent with the startup turn-over date for the various systems. Following completion of all systems and their associated inspections, the inspection results will be available for inspection.

Should you have any questions or require additional clarification, please contact me.

Very truly yours,

K P Baskin

cc: U. S. Nuclear Regulatory Commission
Office of Inspection and Enforcement
Division of Reactor Operations Inspection
Washington, D. C. 20555

R. Pate, (NRC Site Inspector)
San Onofre Units 2 and 3

67

AD/I
2

8008100061

79-143

Response to IE Bulletin 79-14
Seismic Analysis for As-Built
Safety Related Piping Systems

Introduction

The subject bulletin addresses an NRC concern which was raised when inspection of some operating plants disclosed that installed piping systems were not in conformance with design documents. The specific concern is that non-conformances between the design document, used as input information to the seismic analysis of the piping system, and the as-built condition could potentially impact the validity of the seismic piping analysis.

In response to the NRC concerns, we have reviewed the current status of design of all safety related piping 2-1/2 inches in diameter and greater and of Seismic Category I piping, regardless of size which was dynamically analyzed by computer. This review included the source of input data, procedures used in seismic design of piping system and associated supports, definition of construction tolerances and procedures to verify the compatibility between the seismic input data and as-built conditions. It is our opinion that current project procedures adequately address the concerns raised in the subject bulletin.

Background

The design and analysis of all safety related piping is based on the documents listed in Table 1. Jobsite inspections are performed by field QC engineers to verify piping installations using the design documents listed in Table 2 and the acceptance criteria specified in the appropriate construction specifications. In addition to the field inspection program to verify as-built conditions a start-up system review program has been implemented to review the design basis input data used in the seismic analysis of the piping system to assure compatibility of the input data with the most recent revisions of the associated documents, including as-built conditions. Details of the field inspection program and start-up system review program are included in subsequent sections of this report.

Summary of Field QC Inspection Program

Prior to the mechanical turn over of a system to start-up, the field QC engineers perform a final inspection of all safety related piping systems to ensure that the installation and documentation of the piping and appurtenances are in accordance with associate design documents and specification requirements. The tools used by the QC engineers in performing these inspections are the tape measure, plumb bob, the inclinometer and the level. Valve and valve operator type, location and orientation are checked as are the location and orientation of other in line components. The location of pipe bends and branch lines are checked. The slope of the lines are checked when specified. Measurements are made using surveyors reference marks for both horizontal and vertical location whenever possible. Pipe Support locations are checked for conformance

to acceptance criteria in controlling specifications. The most critical dimensions are relative in-line piping component dimensions such as the distance between elbows, tees, valves, supports, etc. Walls, floors and ceilings are used as reference points only and include consideration of structural tolerances as well.

A detailed penetration inspection program is being developed to specify the minimum clearance requirements for all safety related piping penetrations through floors, walls or ceilings to ensure that the operational and seismic motion of the pipe is not restricted. All safety related piping penetrations will then be inspected by the field QC engineer to ensure compliance with this criteria.

Nonconformances are identified in accordance with project procedures and returned to Engineering for review and disposition. Restriction to pipe motion in penetrations through walls, floors or ceilings will be documented in a similar manner. Engineering dispositioning results in either a change to the installed piping system or a revision to the associated seismic analysis or engineering design documents.

Summary of Start-Up System Review Program

The following is a brief summary of the San Onofre Project Engineering start-up system review program:

- 1) All isometric drawings are reviewed against the current area drawings and their associated DCN's, and FCR's.
- 2) The isometric drawings are reviewed by the stress group against the current stress analysis. At this time all associated pipe support assembly drawings and their associated DCN's and FCR's are reviewed against the current stress analysis. All differences between actual routing, dimensions, and pipe support locations with respect to the stress analysis are resolved either by hand calculations or computer reanalysis.
- 3) Pipe Support location tolerances are controlled by Construction specification CS P207. Deviation from the specified location tolerances require Engineering approval. This results in stress evaluation of the proposed change.
- 4) Pipe geometry tolerances are controlled by Construction Specification CS P204. Tolerances listed in CS P204 allow for minor dimensional differences between the area drawings and the "as-built" configurations. Variations within the specified limits have no effect on the seismic analysis. Deviation from CS P204 requires Engineering approval in the form of a DCN or FCR. Deviations are incorporated into the stress analysis and evaluated for their impact on pipe support design.
- 5) Prior to the mechanical turn over of a system to start-up, all stress calculations will be finalized. This will include a check of all pertinent data used in the seismic analysis. A check list will be utilized to compare the input data used in the seismic

analysis with the most recent revision of the associated documents, including as-built conditions.

Each safety related start-up system receives the procedure listed in Items 1 thru 5.

Conclusions

The existing project inspection and review programs provide adequate controls to substantiate the validity of the seismic analysis of all safety related piping systems from the standpoint of compatibility between the design basis input used in analysis and the as-built configuration of the piping system. Completion of the stated design review is finalized prior to turn over to start-up.

Table 1. Design Analysis

Design Document	Analytical Input
Area Drawings/Piping Isometrics	Pipe length and direction, equipment location, component locations and orientations
Line Designation List	Pipe size, wall thickness, pressure, temperature, material, insulation type and thickness
Material Class Sheets	Branch connections (material and pipe schedule)
P&ID's	Material class, Code class, Seismic category, pressure, temperature and line size
Response Spectrum Curves	Acceleration vs. period for a given location
Vendor Specifications and Drawings	Interface requirements, including sizes, allowable loads, movements, weights, frequency limits, operating modes etc.

Table 2. Inspection and Verification

Inspection Document	Inspection Element
Area Drawings	Pipe size, pipe length and direction, valve and component locations.
Penetration Clearance Data	Required clearance of pipe relative to penetration sleeve by quadrant
Pipe Support Detail Drawings	Identification, type, location, orientation, size, construction (element sizes, welds, etc.)
Valve Vendor Drawings	Identification, type, operator type and orientation