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Docket No. 70-754
M-3 Project

MEMORANDUM FOR: Leland C. Rouse, Chief
Advanced Fuel and Spent Fuel Licensing Branch

FROM: J. E. Ayer
Advanced Fuel and Spent Fuel Licensing Branch

W. Burkhardt
Advanced Fuel and Spent Fuel Licensing Branch

SUBJECT: SEISMIC EVALUATION OF BUILDING 102 OF THE GENERAL ELECTRIC VALLECITOS NUCLEAR CENTER

The purpose of this memorandum is to recommend endorsement of the attached review as a staff position and a basis for succeeding increments of the analysis of the effects of natural phenomena upon existing plutonium fabrication facilities. A draft of the Los Alamos Scientific Laboratory (LASL) report has been reviewed by Dr. C. K. Chou, Lawrence Livermore Laboratory; Dr. J. R. McDonald, Texas Tech University; Dr. W. J. Hall and Dr. Nathan M. Newmark, Nathan M. Newmark Associates; J. Mishima, Battelle Northwest Laboratory; and J. E. Ayer, W. Burkhardt and Dr. W. E. Vesely, NRC. The final LASL report incorporates the results of that review. Drs. Hall and Newmark have documented their assessment in the attached report dated September 29, 1980.

We recommend that this review including its summary and conclusions be adopted as a staff position subject to your approval. Subsequent to your approval, we will make copies available to the public and to the General Electric Company in accordance with review and documentation procedures agreed upon and described in our February 10, 1977 memorandum to R. M. Bernero.

Original signed by
James E. Ayer

J. E. Ayer
Advanced Fuel and Spent Fuel Licensing Branch
Division of Fuel Cycle and Material Safety

Original signed by
W. Burkhardt

W. Burkhardt
Advanced Fuel and Spent Fuel Licensing Branch
Division of Fuel Cycle and Material Safety

Approved: Original signed by
Leland C. Rouse
L. C. Rouse, Chief
Advanced Fuel and Spent Fuel Licensing Branch

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Enclosure: As stated

OFFICE ▶			FCAF	FCAF	FCAF	
SURNAME ▶			JEAyer:flb	WBurkhardt	LCRouse	
			74205			
DATE ▶			11/13/80	11/21/80	11/19/80	

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NATHAN M. NEWMARK
CONSULTING ENGINEERING SERVICES

1114 CIVIL ENGINEERING BUILDING
URBANA, ILLINOIS 61801

29 September 1980

Mr. Winston Burkhardt
Fuel Reprocessing and Recycle Branch
Division of Fuel Cycling and Material Safety
US Nuclear Regulatory Commission
Washington, DC 20555

Re: Final Report on Seismic Evaluation
of Building 102 at Vallecitos Site
Contract NRC-03-78-150

Dear Mr. Burkhardt:

We are enclosing two copies of our final report on the noted facility. The report has been signed by both Dr. Newmark and me.

Sincerely yours,

W. J. Hall

W. J. Hall

pg

Enclosures (3)

cc: N. M. Newmark

NATHAN M. NEWMARK
CONSULTING ENGINEERING SERVICES

1114 CIVIL ENGINEERING BUILDING
URBANA, ILLINOIS 61801

29 September 1980

Mr. Winston Burkhardt
Fuel Reprocessing and Recycle Branch
Division of Fuel Cycling and Material Safety
US Nuclear Regulatory Commission
Washington, DC 20555

Re: Contract NRC-03-78-150
Seismic Evaluation of Building 102 of the
General Electric Vallecitos Nuclear Center

Dear Mr. Burkhardt:

This report contains our evaluation of the capability of Building 102 of the General Electric Vallecitos Nuclear Center to withstand seismic shaking and fault motion. Our report is based in part on material contained in Ref. 1, as well as on the supporting Engineering Decision Analysis Company reports noted in Ref. 1. One of the authors of this report, Dr. W. J. Hall, visited the site and inspected Building 102 in June 1977 and again briefly in April 1979; in the interim both of us have participated in numerous meetings and telephone conversations with personnel from the U.S. Nuclear Regulatory Commission, with EDAC during the early stages, and most recently with LASL concerning evaluation of the noted facility.

Description of Facility

The General Electric Vallecitos Nuclear Center is located 5 miles SSE of Pleasanton, California on the north side of the Vallecitos Valley.

NATHAN M. NEWMARK
CONSULTING ENGINEERING SERVICES

1211 CIVIL ENGINEERING BUILDING
URBANA, ILLINOIS 61801

14 April 1980

SEISMIC EVALUATION OF VALLECITOS SITE

by

N. M. Newmark & W. J. Hall
Nathan M. Newmark Consulting Engineering Services
1211 Civil Engineering Building
Urbana, Illinois 61801

I. CONDITIONS CONSIDERED AND BASIS OF EVALUATION

The purpose of this report is to define a rational basis for seismic evaluation of the General Electric test reactor and other facilities located near Vallecitos, California. The major facilities considered are within three miles of the Calaveras Fault and very close to, or possibly just over, a fault identified as the Verona Fault.

After discussion with a number of persons and a review of reports, documents, and letters from NRC, the U.S. Geological Survey, and the TERA Corporation, studies for Diablo Canyon, and recognizing the lack of correlation of damage to structures and equipment in relation to peak acceleration (including the 6 August 1979 Coyote Lake earthquake and the 15 October 1979 Imperial Valley earthquake), in the light of our judgment and experience we recommend the use of the criteria described herein for the seismic evaluation of the site and for the review of structures and equipment in structures at the site. It is noted that these recommendations are the writers' sole responsibility and do not represent the official views of NRC or the USGS.

It is considered that an earthquake of magnitude 7 to 7.5 might occur on the Calaveras Fault and the epicenter might be located close to the

NATHAN M. NEWMARK
CONSULTING ENGINEERING SERVICES

1211 CIVIL ENGINEERING BUILDING
URBANA, ILLINOIS 61801

29 September 1980

SEISMIC EVALUATION OF VALLECITOS SITE -- BASIS OF EARTHQUAKE GROUND MOTION DESIGN CRITERIA

by

W. J. Hall and N. M. Newmark

Nathan M. Newmark Consulting Engineering Services
1211 Civil Engineering Building
Urbana, Illinoit 61801

INTRODUCTION

The purpose of this background memorandum is to describe in more detail the basis of our reasoning employed in arriving at the recommended seismic review criteria for the Vallecitos site as presented in our memorandum of 14 April 1980. Our recommendations remain unchanged. It is important to note that the earthquake ground motion design criteria constitute but one part of the design criteria employed in the design or review of a nuclear facility.

The most important seismic effects for a nuclear plant arising from earthquake-induced motions at the site normally would be expected to occur from earthquakes having a source close to the site rather than from more distant earthquakes on the various fault systems. This observation has been taken into account in arriving at the recommendations for the Vallecitos facility since the sources are considered to be possibly very close to, or under, the site.

Most of the information available about earthquake motions is probabilistic in nature but, in the absence of definite probabilistic approaches and established criteria for estimating such effects, the