

April 15, 1980

DOCKET NOS. 50-361
AND 50-362

APPLICANTS: SOUTHERN CALIFORNIA EDISON COMPANY (SCE)
SAN DIEGO GAS AND ELECTRIC COMPANY (SDG&E)

FACILITY: SAN ONOFRE NUCLEAR GENERATING STATION, UNITS 2 AND 3

SUBJECT: SUMMARY OF SAN ONOFRE SEISMOLOGY MEETING

On March 4, 1980, the NRC staff met with the applicants, the applicant's consultants, the United States Geological Survey, the California Division of Mines and Geology, and NRC staff consultant, Dr. David B. Stemmmons in Los Angeles, California. Attendees at the meeting are given in Enclosure 1. The purpose of the meeting was to allow the applicants to summarize the information they recently submitted addressing the seismological concerns identified in the NRC staff letter of December 21, 1979, "Additional Questions and Positions on the Final Safety Analysis Report for the San Onofre Nuclear Generating Station, Units 2 and 3," Robert L. Baer to James H. Drake and D. W. Gilman. The agenda for the meeting is given in Enclosure 2.

During the meeting the staff indicated that further review of the material presented by the applicant would be necessary before reaching any conclusions. One area that was identified as requiring additional investigation was a comparison of the design basis vertical spectra for SONGS 2 and 3 with the vertical spectra measured during the October 15, 1979 Imperial Valley earthquake.

ORIGINAL SIGNED BY

Harry Rood
Light Water Reactors Branch No. 2
Division of Project Management

Enclosures:

- 1. Attendance List
- 2. Agenda

ccs w/enclosures:
See next pages

HR ~~8000820~~ **575** 8004300586 *50*

OFFICE	DPM:LWR #2	DPM:LWR #2			
SURNAME	HRood:ab	RLBaer <i>RLB</i>			
DATE	4/15/80	4/15/80			

Meeting Summary

Docket File
NRC PDR
Local PDR
TIC
NRR Reading
LWR #2 File
E. Case
D. F. Ross
D. B. Vassallo
S. A. Varga
D. Skovholt
W. Gammill
J. Stolz
R. Baer
O. Parr
L. Rubenstein
C. Heltemes
W. Haass
R. Houston
L. Crocker
F. J. Williams
R. J. Mattson
R. DeYoung
Project Manager - H. Rood
Attorney, ELD -
J. Lee
IE(3)
ACRS(16)

T. Murphy
J. Knight
S. Hanauer
R. Tedesco
R. Bosnak
S. Pawlicki
F. Schauer
K. Kniel
T. Noyak
Z. Rosztoczy
W. Butler
V. Benaroya
R. Satterfield
V. Moore
M. Ernst
F. Rosa
R. P. Denise
EP Branch Chief
G. Chipman
J. Collins
W. Kreger
G. Lear
B. Youngblood
L. Hulman
NRC Participants:

T. Cardone
L. J. Chandler
R. Jackson
G. R. Quittschreiber
L. Reiter
R. L. Rothman
D. B. Slemmons

Mr. James H. Drake
Vice President
Southern California Edison Company
2244 Walnut Grove Avenue
P. O. Box 800
Rosemead, California 91770

Mr. B. W. Gilman
Senior Vice President - Operations
San Diego Gas and Electric Company
101 Ash Street
P. O. Box 1831
San Diego, California 92112

cc: Charles R. Kocher, Esq.
James A. Beoletto, Esq.
Southern California Edison Company
2244 Walnut Grove Avenue
P. O. Box 800
Rosemead, California 91770

Chickering and Gregory
ATTN: David R. Pigott, Esq.
Counsel for San Diego Gas
& Electric Company and
Southern California
Edison Company
Three Embarcadero Center, 23rd Floor
San Francisco, California 94112

Mr. Kenneth E. Carr
City Manager
City of San Clemente
100 Avenida Presidio
San Clemente, California 92672

Alan R. Watts, Esq.
Rourke & Woodruff
1055 North Main Street
Suite 1020
Santa Ana, California 92701

Lawrence Q. Garcia, Esq.
California Public Utilities Commission
5066 State Building
San Francisco, California 94102

Mr. R. W. DeVane, Jr.
Combustion Engineering, Inc.
1000 Prospect Hill Road
Windsor, Connecticut 06095

Mr. James H. Drake
Mr. B. W. Gilman

cc: Mr. P. Dragolovich
Bechtel Power Corporation
P. O. Box 60860, Terminal Annex
Los Angeles, California 90060

Mr. Mark Medford
Southern California Edison Company
2244 Walnut Grove Avenue
P. O. Box 800
Rosemead, California 91770

Henry Peters
San Diego Gas & Electric Company
Post Office Box 1831
San Diego, California 92112

Ms. Lyn Harris Hicks
Advocate for GUARD
3908 Calle Ariana
San Clemente, California 92672

Richard J. Wharton, Esq.
Wharton and Pogalies
2667 Camino Del Rio South
Suite 106
San Diego, California 92108

Phyllis M. Gallagher, Esq.
1695 West Crescent Avenue
Suite 222
Anaheim, California 92701

Mr. A. S. Carstens
2071 Caminito Circulo Norte
Mt. La Jolla, California 92037

Resident Inspector/San Onofre Nuclear Power Station
c/o U. S. Nuclear Regulatory Commission
P. O. Box 3550
San Onofre, California 92672

ATTENDEESMARCH 4, 1980 SEISMOLOGY MEETINGSAN ONOFRE NUCLEAR GENERATING STATION, UNITS 2 AND 3SOUTHERN CALIFORNIA EDISON CO.

K. P. Baskin
 J. A. Beoletto
 P. L. Ehlig (Consultant)
 H. G. Hawkins
 R. S. Hart (Consultant)
 J. G. Haynes
 R. L. McNeill (Consultant)
 J. L. McNey
 M. O. Medford
 W. C. Moody
 D. G. Moore (Consultant)
 R. Scholes
 P. J. West

SAN DIEGO GAS AND ELECTRIC CO.

W. D. Griffith
 H. Peters

WOODWARD-CLYDE CONSULTANTS

J. A. Barneich
 L. S. Cluff
 J. A. Egan
 P. D. Guptill
 E. G. Heath
 C. M. Idriss
 P. L. Knuepfer
 K. McNally
 R. Sadigh
 W. U. Savage
 P. G. Somerville

TERA

G. A. Frazier
 D. H. Hamilton
 A. Jurkevics

CHICKERING AND GREGORY

D. R. Pigott

NUCLEAR REGULATORY COMMISSION

T. Cardone
 L. J. Chandler
 R. Jackson
 J. P. Knight
 G. R. Quittschreiber
 L. Reiter
 H. Rood
 R. L. Rothman
 D. B. Slemmons (Consultant)

U. S. GEOLOGICAL SURVEY

D. J. Andrews
 M. G. Bonilla
 J. F. Devine
 R. H. Morris

CALIFORNIA DIVISION OF MINES AND GEOLOGY

P. Y. Amimoto
 J. Davis
 T. E. Gay, Jr.
 C. Real
 S. S. Tan

FRIENDS OF THE EARTH

G. Barlow
 A. Carstens
 R. J. Wharton

PACIFIC GAS AND ELECTRIC CO.

F. W. Brady
 V. J. Ghio

OCEANSIDE BLADE-TRIBUNE

G. Davis

CITY NEWS SERVICE

G. Collins

MEETING WITH NRC GEOSCIENCES BRANCH
SAN ONOFRE NUCLEAR GENERATING STATION
UNITS 2 AND 3
MARCH 4, 1980

Morning Session 10 AM to 12:30 PM

- A. General Introduction K. Baskin
- B. Ground Motion Characteristics
1. Overview - introduction of simulation studies and treatment of recorded data. I. Idriss
 2. Simulation Studies D. Hadley
 - . physical bases of attenuation relationship for distance and magnitude
 - . evaluation of directivity (focusing) effects
 3. Studies Based on Recorded Data K. Sadigh
 - . selection and treatment of data
 - . the 1979 Imperial Valley Earthquake
 - . magnitude dependence
 - . instrumental ground motions for M_S 6 1/2 and M_S 7
 4. Summary of assessment of Ground Motion characteristics and comparison of instrumental ground motion parameters for M_S 6 1/2 and 7 with the design basis spectrum. I. Idriss
- C. General Discussion and Questions on Ground Motion Characteristics I. Idriss

MEETING WITH NRC GEOSCIENCES BRANCH
SAN ONOFRE NUCLEAR GENERATING STATION
UNITS 2 AND 3
MARCH 4, 1980

Afternoon Session 1:30 to 5 PM

- D. Maximum Earthquake Magnitude for the Offshore Zone of Deformation (OZD)
1. Overview - general introduction of and description of the use of the degree of fault activity approach for evaluating the maximum magnitude L. Cluff
 2. Geologic Evaluations - E. Heath
 - . tectonic framework
 - . degree of fault activity approach
 - . geologic slip rate data base
 3. Seismological Evaluations - W. Savage
 - . historical seismicity within 200 miles
 - . seismological features of the OZD including the 1933 earthquake
 - . earthquake recurrence based on slip rate
 4. Selection of Maximum Magnitude and Elements of Conservatism E. Heath
 - . evaluation of maximum magnitude
 - . consistency with fault ranking
 - . elements of conservatism
 5. Summary - discussion of significant conclusions regarding maximum earthquake magnitude for the OZD L. Cluff
- E. General Discussion and Questions on Maximum Magnitude L. Cluff
- F. Comparison of Coastal Boundary with Offshore Zone of Deformation J. Smith
- G. Closure K. Baskin



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

April 15, 1980

DOCKET NOS. 50-361
AND 50-362

APPLICANTS: SOUTHERN CALIFORNIA EDISON COMPANY (SCE)
SAN DIEGO GAS AND ELECTRIC COMPANY (SDG&E)

FACILITY: SAN ONOFRE NUCLEAR GENERATING STATION, UNITS 2 AND 3

SUBJECT: SUMMARY OF SAN ONOFRE SEISMOLOGY MEETING

On March 4, 1980, the NRC staff met with the applicants, the applicant's consultants, the United States Geological Survey, the California Division of Mines and Geology, and NRC staff consultant, Dr. David B. Slemmons in Los Angeles, California. Attendees at the meeting are given in Enclosure 1. The purpose of the meeting was to allow the applicants to summarize the information they recently submitted addressing the seismological concerns identified in the NRC staff letter of December 21, 1979, "Additional Questions and Positions on the Final Safety Analysis Report for the San Onofre Nuclear Generating Station, Units 2 and 3," Robert L. Baer to James H. Drake and D. W. Gilman. The agenda for the meeting is given in Enclosure 2.

During the meeting the staff indicated that further review of the material presented by the applicant would be necessary before reaching any conclusions. One area that was identified as requiring additional investigation was a comparison of the design basis vertical spectra for SONGS 2 and 3 with the vertical spectra measured during the October 15, 1979 Imperial Valley earthquake.

Harry Rood

Harry Rood
Light Water Reactors Branch No. 2
Division of Project Management

Enclosures:

1. Attendance List
2. Agenda

ccs w/enclosures:
See next pages

Memo
4

BD
8004300 586

Mr. James H. Drake
Vice President
Southern California Edison Company
2244 Walnut Grove Avenue
P. O. Box 800
Rosemead, California 91770

Mr. B. W. Gilman
Senior Vice President - Operations
San Diego Gas and Electric Company
101 Ash Street
P. O. Box 1831
San Diego, California 92112

cc: Charles R. Kocher, Esq.
James A. Beoletto, Esq.
Southern California Edison Company
2244 Walnut Grove Avenue
P. O. Box 800
Rosemead, California 91770

Chickering and Gregory
ATTN: David R. Pigott, Esq.
Counsel for San Diego Gas
& Electric Company and
Southern California
Edison Company
Three Embarcadero Center, 23rd Floor
San Francisco, California 94112

Mr. Kenneth E. Carr
City Manager
City of San Clemente
100 Avenida Presidio
San Clemente, California 92672

Alan R. Watts, Esq.
Rourke & Woodruff
1055 North Main Street
Suite 1020
Santa Ana, California 92701

Lawrence Q. Garcia, Esq.
California Public Utilities Commission
5066 State Building
San Francisco, California 94102

Mr. R. W. DeVane, Jr.
Combustion Engineering, Inc.
1000 Prospect Hill Road
Windsor, Connecticut 06095

Mr. James H. Drake
Mr. B. W. Gilman

cc: Mr. P. Dragolovich
Bechtel Power Corporation
P. O. Box 60860, Terminal Annex
Los Angeles, California 90060

Mr. Mark Medford
Southern California Edison Company
2244 Walnut Grove Avenue
P. O. Box 800
Rosemead, California 91770

Henry Peters
San Diego Gas & Electric Company
Post Office Box 1831
San Diego, California 92112

Ms. Lyn Harris Hicks
Advocate for GUARD
3908 Calle Ariana
San Clemente, California 92672

Richard J. Wharton, Esq.
Wharton and Pogalies
2667 Camino Del Rio South
Suite 106
San Diego, California 92108

Phyllis M. Gallagher, Esq.
1695 West Crescent Avenue
Suite 222
Anaheim, California 92701

Mr. A. S. Carstens
2071 Caminito Circulo Norte
Mt. La Jolla, California 92037

Resident Inspector/San Onofre Nuclear Power Station
c/o U. S. Nuclear Regulatory Commission
P. O. Box 3550
San Onofre, California 92672

ATTENDEES

MARCH 4, 1980 SEISMOLOGY MEETING

SAN ONOFRE NUCLEAR GENERATING STATION, UNITS 2 AND 3

SOUTHERN CALIFORNIA EDISON CO.

K. P. Baskin
J. A. Beoletto
P. L. Ehlig (Consultant)
H. G. Hawkins
R. S. Hart (Consultant)
J. G. Haynes
R. L. McNeill (Consultant)
J. L. McNey
M. O. Medford
W. C. Moody
D. G. Moore (Consultant)
R. Scholes
P. J. West

SAN DIEGO GAS AND ELECTRIC CO.

W. D. Griffith
H. Peters

WOODWARD-CLYDE CONSULTANTS

J. A. Barneich
L. S. Cluff
J. A. Egan
P. D. Guptill
E. G. Heath
C. M. Idriss
P. L. Knuepfer
K. McNally
R. Sadigh
W. U. Savage
P. G. Somerville

TERA

G. A. Frazier
D. H. Hamilton
A. Jurkevics

CHICKERING AND GREGORY

D. R. Pigott

NUCLEAR REGULATORY COMMISSION

T. Cardone
L. J. Chandler
R. Jackson
J. P. Knight
G. R. Quittschreiber
L. Reiter
H. Rood
R. L. Rothman
D. B. Slemmons (Consultant)

U. S. GEOLOGICAL SURVEY

D. J. Andrews
M. G. Bonilla
J. F. Devine
R. H. Morris

CALIFORNIA DIVISION OF MINES AND GEOLOGY

P. Y. Amimoto
J. Davis
T. E. Gay, Jr.
C. Real
S. S. Tan

FRIENDS OF THE EARTH

G. Barlow
A. Carstens
R. J. Wharton

PACIFIC GAS AND ELECTRIC CO.

F. W. Brady
V. J. Ghio

OCEANSIDE BLADE-TRIBUNE

G. Davis

CITY NEWS SERVICE

G. Collins

MEETING WITH NRC GEOSCIENCES BRANCH
SAN ONOFRE NUCLEAR GENERATING STATION
UNITS 2 AND 3
MARCH 4, 1980

Morning Session 10 AM to 12:30 PM

- | | |
|---|-----------|
| A. General Introduction | K. Baskin |
| B. Ground Motion Characteristics | |
| 1. Overview - introduction of simulation studies and treatment of recorded data. | I. Idriss |
| 2. Simulation Studies | D. Hadley |
| . physical bases of attenuation relationship for distance and magnitude | |
| . evaluation of directivity (focusing) effects | |
| 3. Studies Based on Recorded Data | K. Sadigh |
| . selection and treatment of data | |
| . the 1979 Imperial Valley Earthquake | |
| . magnitude dependence | |
| . instrumental ground motions for M_S 6 1/2 and M_S 7 | |
| 4. Summary of assessment of Ground Motion characteristics and comparison of instrumental ground motion parameters for M_S 6 1/2 and 7 with the design basis spectrum. | I. Idriss |
| C. General Discussion and Questions on Ground Motion Characteristics | I. Idriss |

MEETING WITH NRC GEOSCIENCES BRANCH
SAN ONOFRE NUCLEAR GENERATING STATION
UNITS 2 AND 3
MARCH 4, 1980

Afternoon Session 1:30 to 5 PM

- D. Maximum Earthquake Magnitude for the Offshore Zone of Deformation (OZD)
1. Overview - general introduction of and description of the use of the degree of fault activity approach for evaluating the maximum magnitude L. Cluff
 2. Geologic Evaluations - E. Heath
 - . tectonic framework
 - . degree of fault activity approach
 - . geologic slip rate data base
 3. Seismological Evaluations - W. Savage
 - . historical seismicity within 200 miles
 - . seismological features of the OZD including the 1933 earthquake
 - . earthquake recurrence based on slip rate
 4. Selection of Maximum Magnitude and Elements of Conservatism E. Heath
 - . evaluation of maximum magnitude
 - . consistency with fault ranking
 - . elements of conservatism
 5. Summary - discussion of significant conclusions regarding maximum earthquake magnitude for the OZD L. Cluff
- E. General Discussion and Questions on Maximum Magnitude L. Cluff
- F. Comparison of Coastal Boundary with Offshore Zone of Deformation J. Smith
- G. Closure K. Baskin