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

April 10, 1981

RECEIVED
APR 16 1981
U.S. NUCLEAR REGULATORY COMMISSION

Docket No. 50-70

Mr. R. W. Darmitzel, Manager
Irradiation Processing Product Section
Vallecitos Nuclear Center
General Electric Company
P. O. Box 460
Pleasanton, California 94566

Dear Mr. Darmitzel:

The attached letters: October 22, 1980 Ellsworth (USGS) to Maxwell (ACRS Consultant) and December 3, 1980 (unsigned response) directly relate to the GETR Show Cause Proceeding and are provided for your information and the public record. The Ellsworth classification, with respect to activity, of the Verona fault is discussed on page 9, Section A of our May 23, 1980 safety evaluation. The reclassification from "probably" active to "possibly" active, as discussed in the attachments, does not alter our conclusions regarding the proper seismic design bases for the GETR.

Sincerely,

Chris Nelson

Chris Nelson, Project Manager
Operating Reactors Branch #3
Division of Licensing

Attachments:
As stated

cc: See next page

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General Electric Company

cc:

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UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

345 Middlefield Road - MS-77
Menlo Park, California 94025

October 22, 1980

Professor John C. Maxwell
Department of Geology
University of Texas
Austin, Texas

Dear Professor Maxwell,

I am sorry to have let your request for the enclosed material remain unanswered for so long, and hope that it will still be of some use to you. Since the ACRS meeting in Sunol I have undertaken the systematic review of all available focal mechanism data in the Livermore Valley study region. The conclusions of that study are in good agreement with the more preliminary results given in Ellsworth and Marks. For example, we find that earthquakes in the general region around Vallecitos Valley to be characterized by oblique-slip to pure thrust focal mechanisms.

One difference that should be noted, and which has some impact on my earlier evaluation of the Verona fault comes from our re-interpretation of the original seismograms for events 6 and 17 in the attached sheets. We now find that either strike slip or thrust fault plane solutions fit the observations. This weakens the case for the identification of the Verona as a "probably" active fault on the basis of seismological evidence. However, the evidence is still permissive and other focal mechanisms indicate compressive tectonics. I would now classify the Verona fault as "possibly" active, based on the microearthquakes and criteria defined in Open-File report 80-515. In view of the fact that the same criteria and data set classified the Greenville fault as possibly active prior to the January 1980 earthquakes, I find little comfort in the revised classification for the Verona fault.

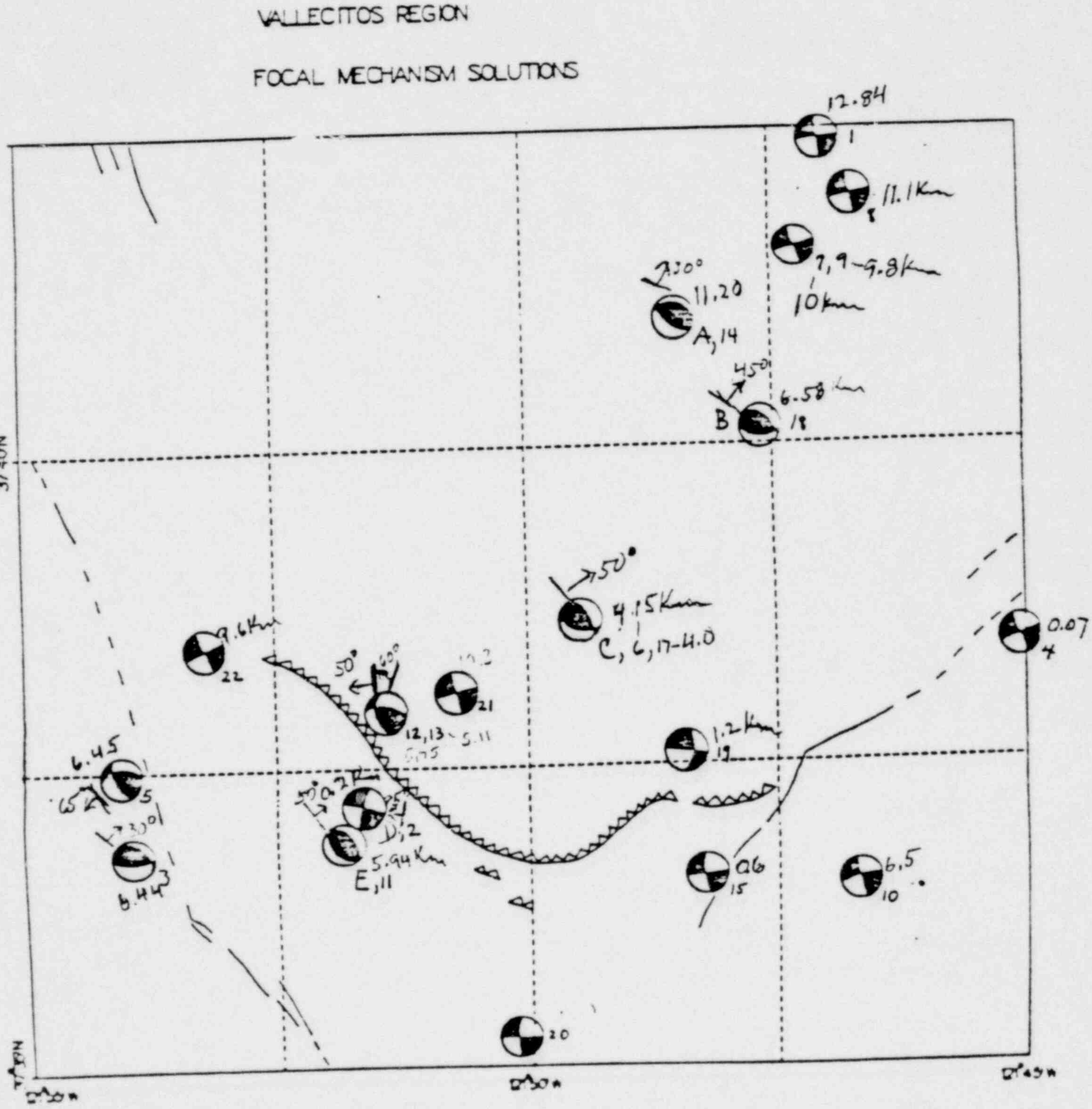
Very truly yours,

Bill Ellsworth

William L. Ellsworth
Geophysicist

GETR

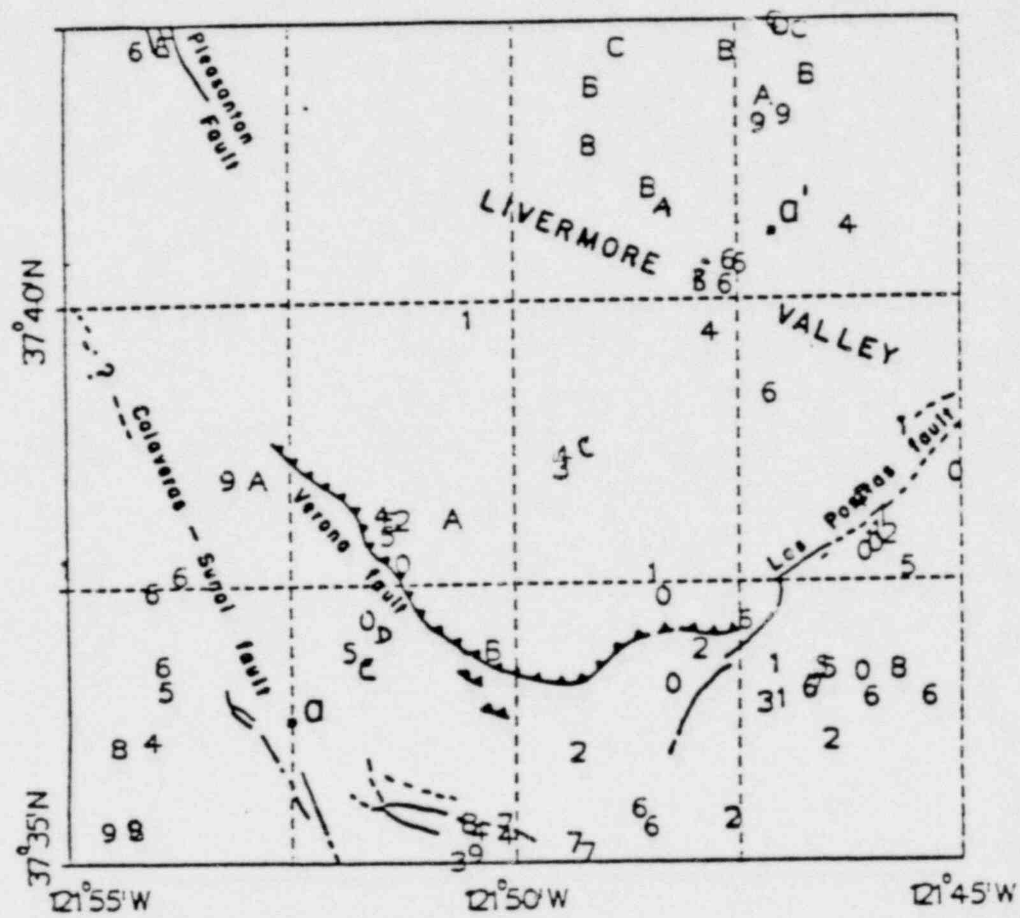
Figure 8



Letters keyed to individual focal mechanisms
Numbers keyed to table

Figure 7

VALLECITOS REGION SEISMICITY



Letters keyed to individual focal Mechanisms

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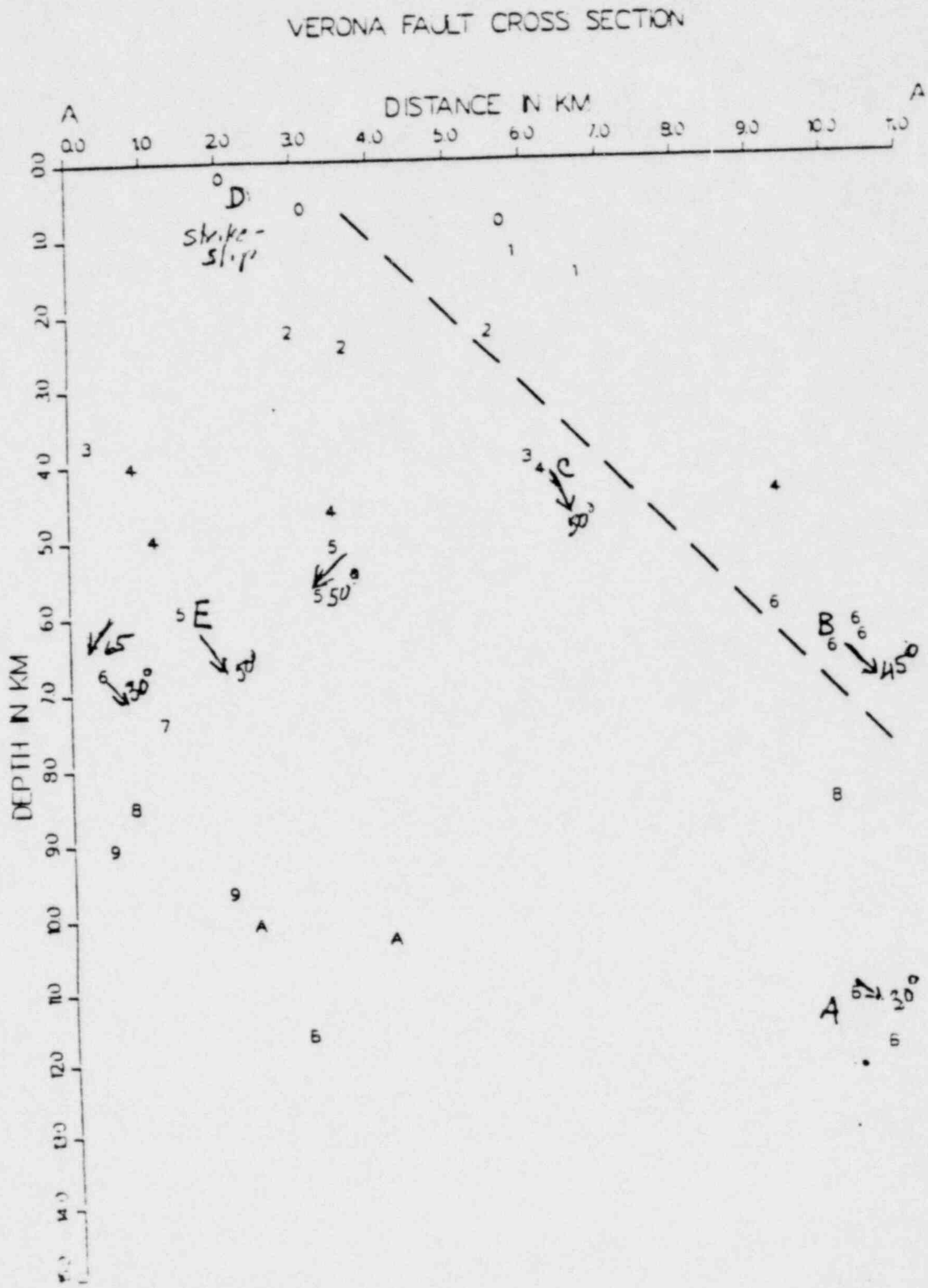
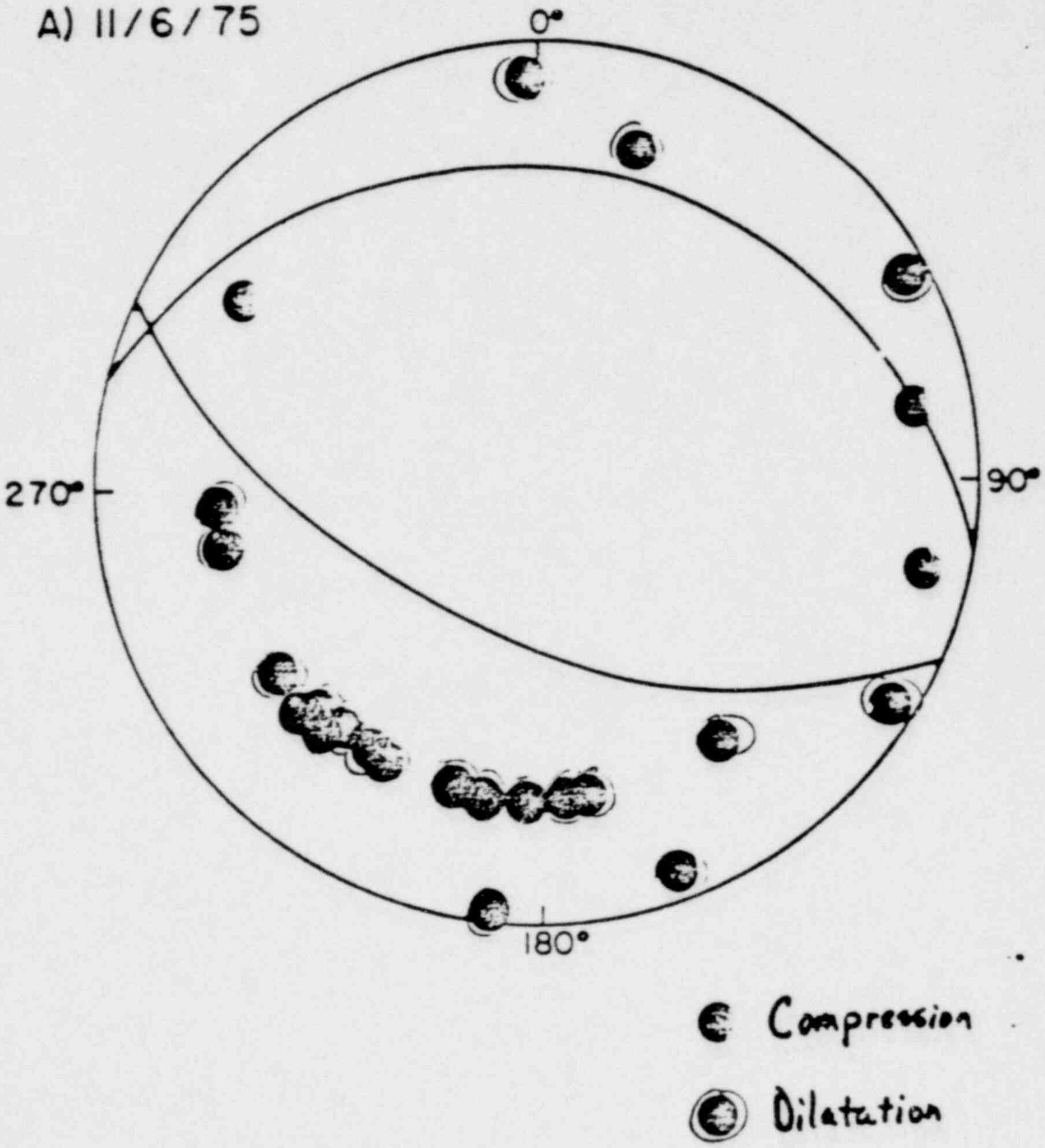
Figure 9

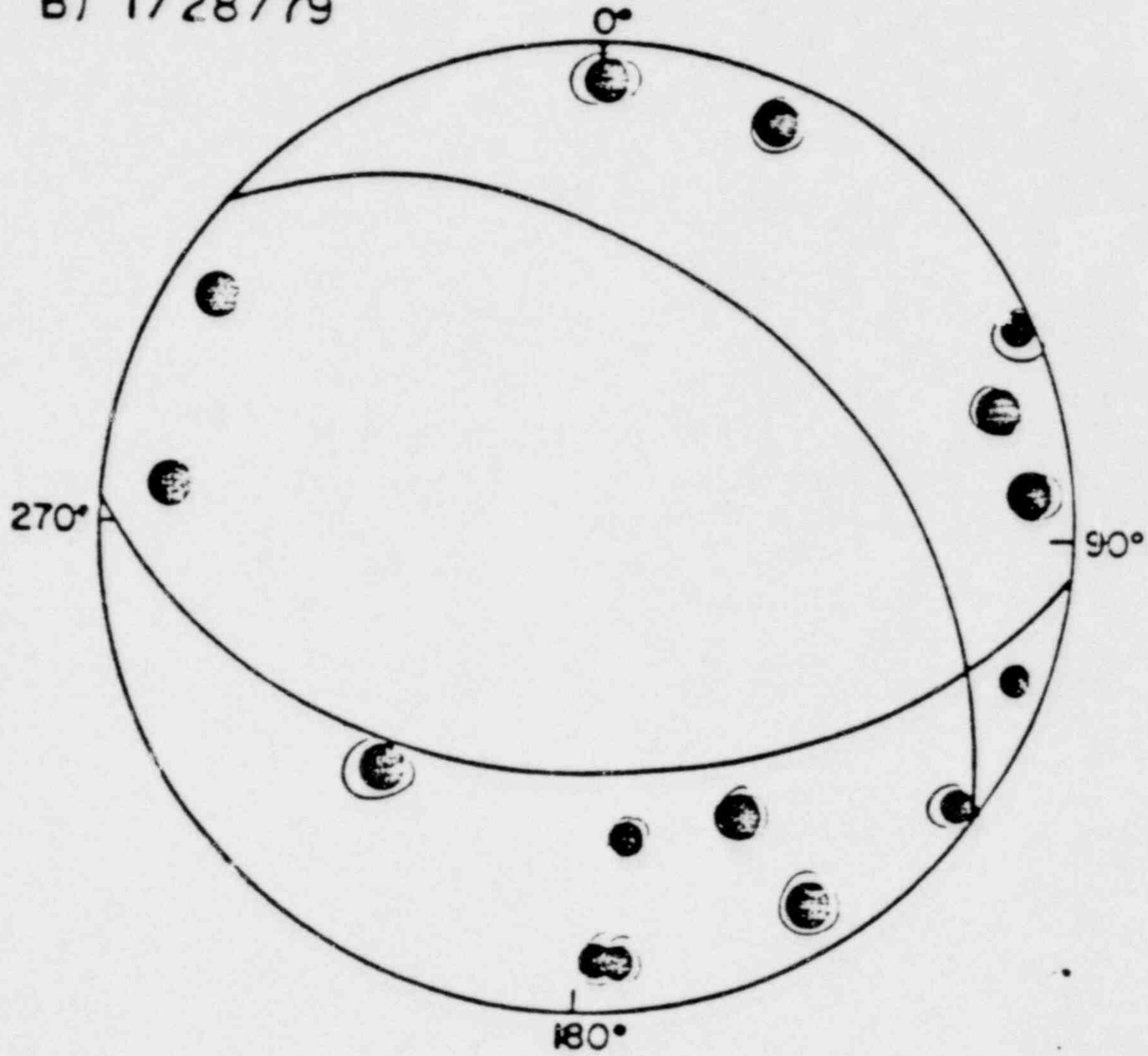


Letters keyed to individual focal mechanisms

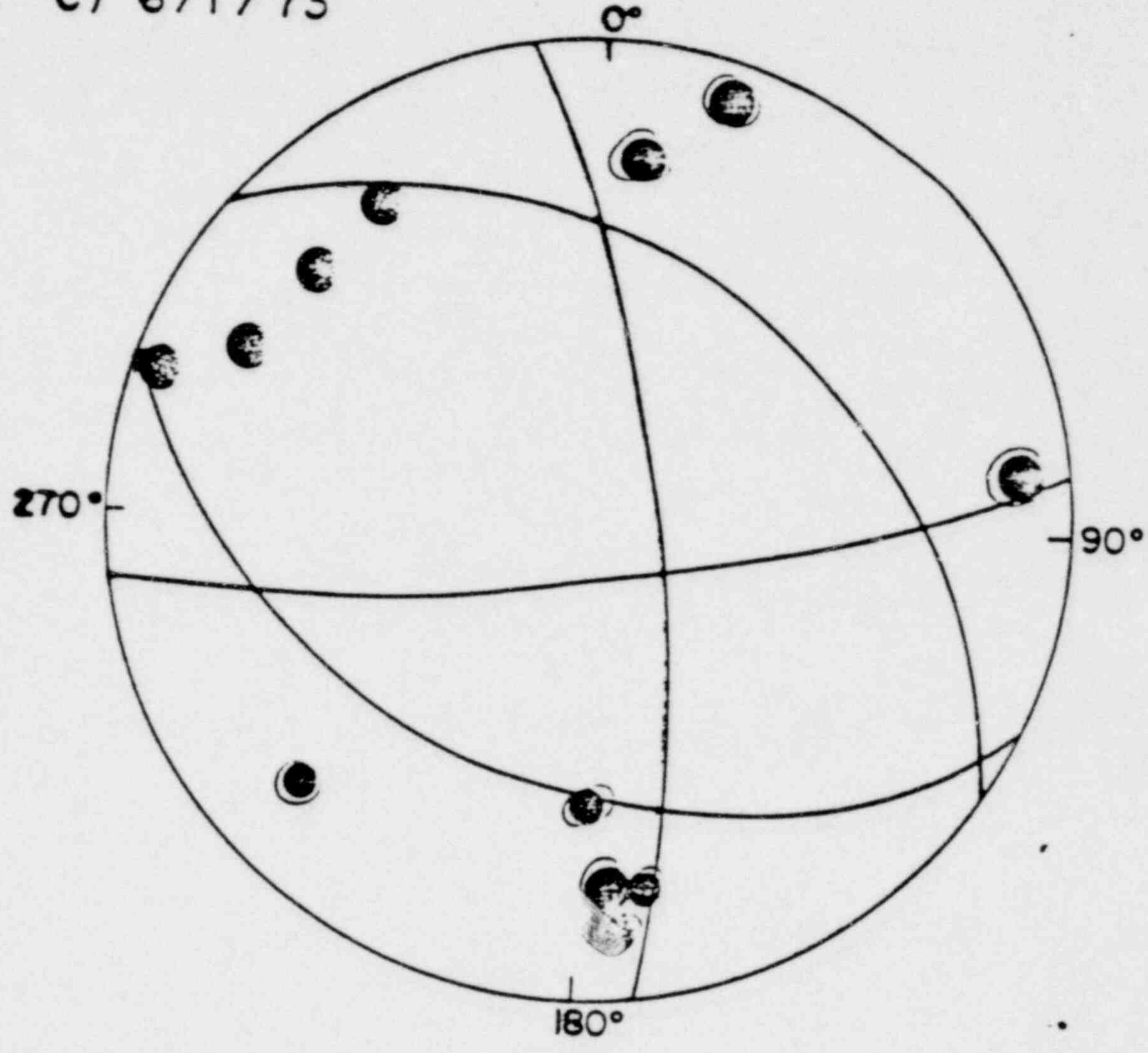
A) 11/6/75



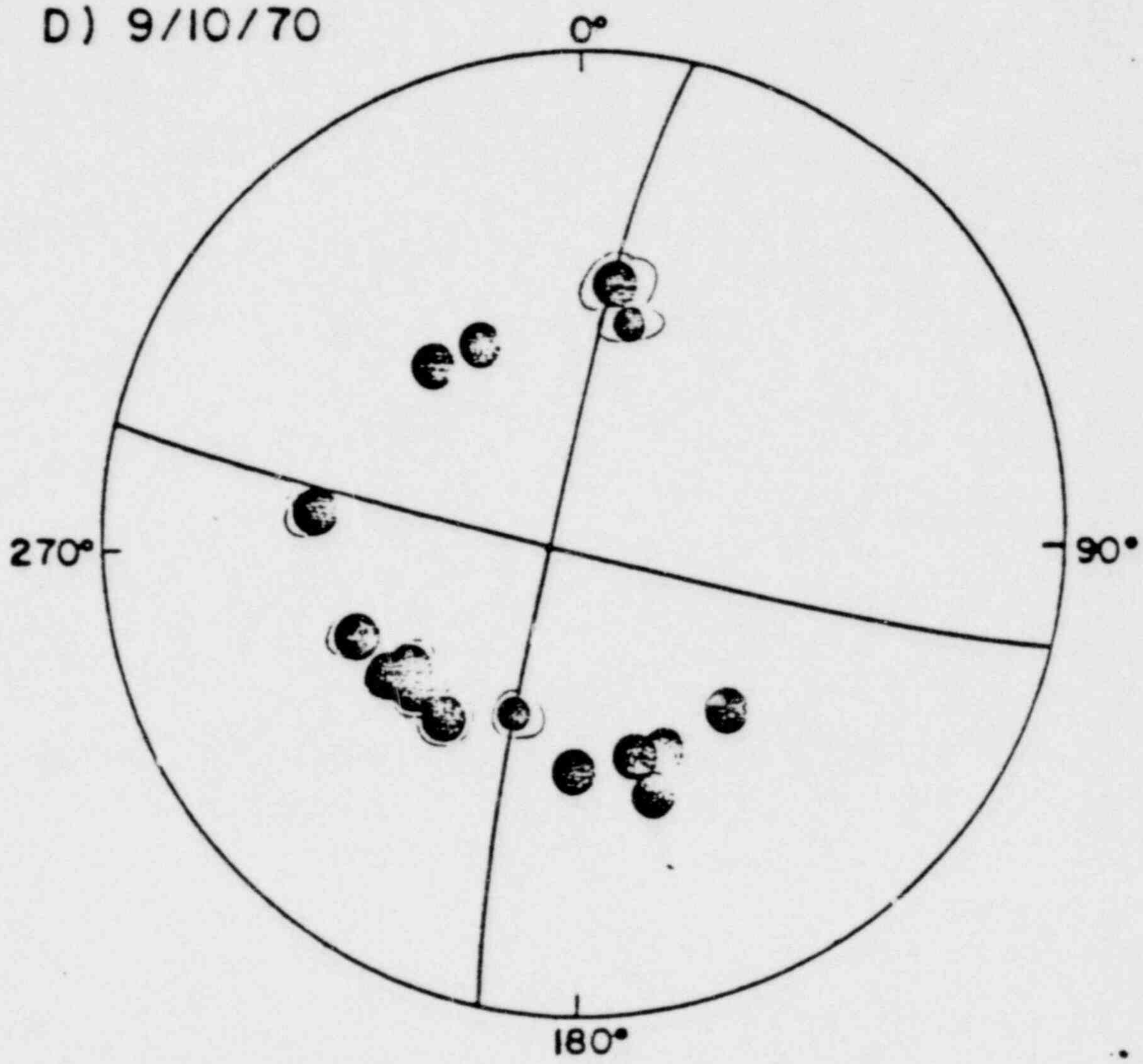
B) 1/28/79



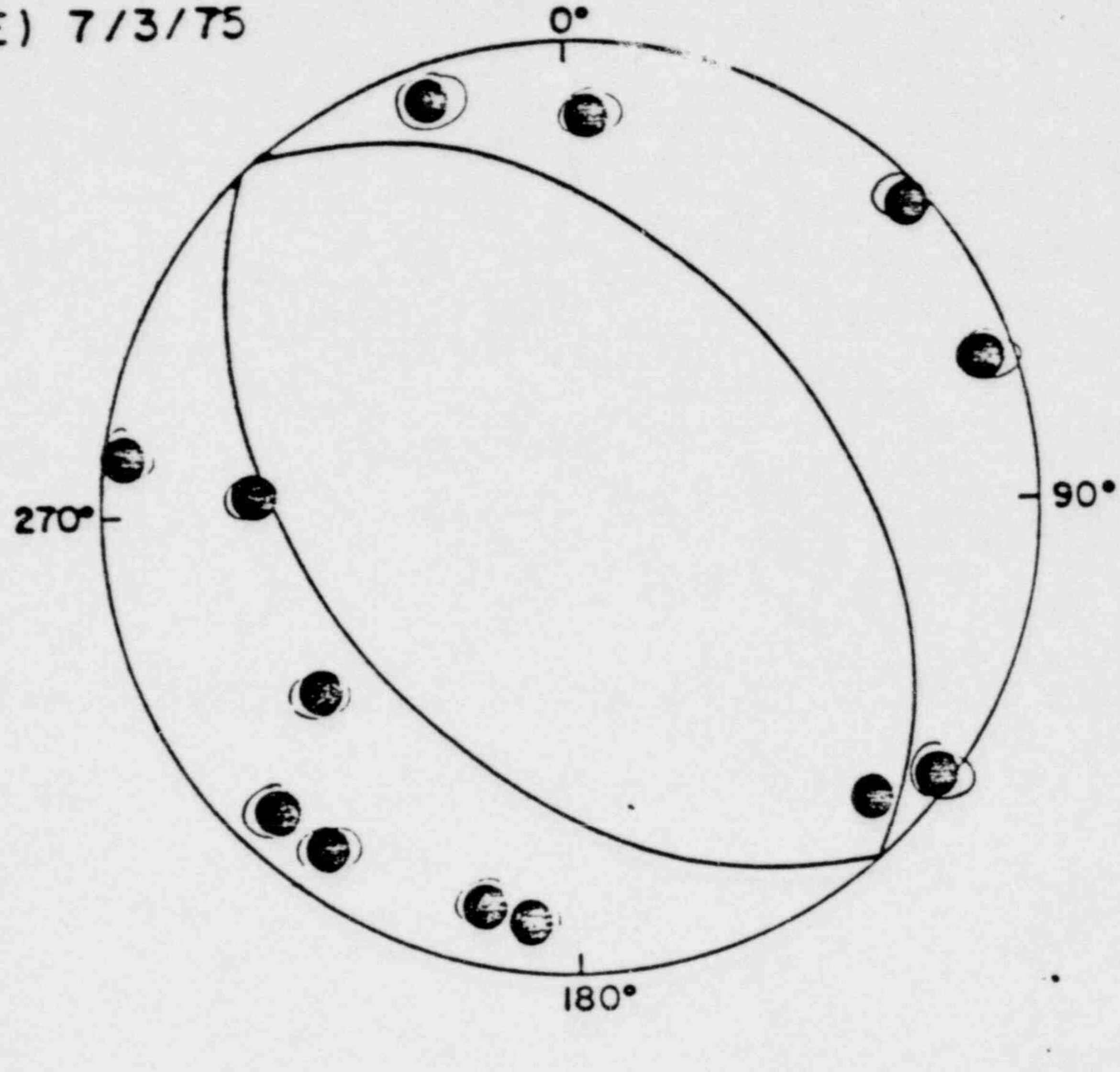
C) 6/1/73



D) 9/10/70



E) 7/3/75



vallecitos.fo 10/22/80 1741.2 pdt Wed

Fault Plane Solution *

	Date	Origin Time		LAT N	LON W	DEPTH (km)	MAG					ERH (km)	ERZ (km)	Q	DD	DA	SA		
1	700708	5 4	55.47	37-48.41	121-46.99	12.84	1.00	14	148	11.7	0.07	0.5	0.4	B1	82.00	90.00	180.00	P	
D 2	700910	784	23.99	37-37.19	121-51.64	0.20		15	86	2.5	0.06	0.2	1.6	B1	234.00	85.00	178.00	T	Thrust
3	721003	2 8	2.37	37-36.80	121-53.93	6.44	1.66	18	72	5.4	0.06	0.2	0.4	A1	48.00	30.00	130.00	P	Thrust
4	721216	2010	1.09	37-38.44	121-46.06	0.07	1.84	10	131	11.3	0.09	0.5	2.6	C1	68.00	90.00	180.00	P	Thrust
5	730105	1656	57.66	37-37.46	121-54.04	6.46	1.69	17	72	5.0	0.06	0.2	0.4	A1	242.00	66.00	135.00	T	Thrust
C 6	730601	1142	13.59	37-38.64	121-49.47	4.15	1.44	11	102	9.6	0.05	0.2	0.4	B1	60.00	50.00	184.00	P	Thrust
7	741020	333	34.04	37-41.55	121-47.24	9.90	1.72	17	185	5.9	0.06	0.2	0.3	B1	72.00	90.00	180.00	T	Thrust
8	741020	344	12.29	37-41.97	121-46.60	11.06	1.03	10	143	6.1	0.10	0.7	1.0	B1	72.00	90.00	180.00	T	Thrust
9	741020	5 6	29.22	37-41.62	121-46.96	9.79	1.82	19	127	6.2	0.06	0.3	0.4	B1	77.00	90.00	180.00	T	
10	750605	1334	57.03	37-38.54	121-46.69	6.56	2.09	23	103	12.6	0.05	0.2	0.3	B1	75.00	90.00	-170.00	T	-normal
E 11	750703	2105	13.51	37-36.90	121-51.84	5.94	1.64	19	85	2.3	0.07	0.2	0.5	B1	50.00	45.00	90.00	T	thrust
12	750814	19 9	30.30	37-37.94	121-51.40	5.75	1.99	21	89	2.2	0.07	0.2	0.5	B1	256.00	50.00	145.00	T	thrust
13	750818	143	22.12	37-38.06	121-51.36	5.11	1.36	14	89	2.2	0.06	0.3	2.4	B1	222.00	60.00	144.00	P	thrust
A 14	751106	2 7	20.03	37-40.99	121-48.47	11.20	1.80	25	116	14.2	0.09	0.3	0.4	B1	10.00	30.00	66.00	P	
15	751113	258	0.90	37-36.60	121-48.23	0.58	2.02	20	96	11.5	0.06	0.2	1.6	B1	263.00	80.00	180.00	P	
16	781019	1 3	21.99	37-37.69	121-54.98	1.52	1.57	11	76	3.5	0.07	0.3	0.5	A1	246.00	75.00	-170.00	P	-normal
17	780404	1369	2.89	37-38.58	121-49.47	3.98	1.09	13	78	9.8	0.15	0.6	1.2	B1	64.00	60.00	133.00	P	
B 18	790122	759	55.62	37-40.13	121-47.62	6.52	1.39	14	91	7.7	0.06	0.4	0.9	B1	32.00	45.00	115.00	P	
19	790215	1046	46.94	37-37.59	121-48.48	1.22	1.87	14	76	11.2	0.13	0.4	0.2	B1	92.00	60.00	180.00	P	
20	790402	1529	53.58	37-35.85	121-50.12	4.99	1.96	24	59	2.0	0.09	0.2	0.5	B1	270.00	80.00	180.00	P	strike-slip
21	790906	1841	23.36	37-38.09	121-50.70	10.29	2.03	18	93	9.2	0.06	0.2	0.2	B1	76.00	90.00	180.00	P	strike-slip
22	791029	2066	58.75	37-38.46	121-53.19	9.06	1.51	19	79	6.3	0.06	0.2	0.3	A1	65.00	90.00	180.00	P	strike-slip

* DD - Dip direction clockwise from north

DA - Dip angle 0°(horizontal) to 90°(vertical)

SA - Slip angle (pole to auxiliary plane)

thrust : SA > 0°

Normal : SA < 0°

Right lateral: |SA| > 90°

Left lateral : |SA| < 90°

THE UNIVERSITY OF TEXAS AT AUSTIN
AUSTIN, TEXAS 78712

Department of Geological Sciences

December 3, 1980

Mr. William L. Ellsworth, Geophysicists
U.S. Geological Survey
345 Middlefield Road - MS-77
Minlow Park, California 94025

Dear Bill:

I appreciate very much you taking the time and effort to bring me up to date on your work in the Vallecitos Region. The work certainly supports the interpretation that the basinal area is being deformed between the Calaveras and Greenville Fault trends. The northerly trending right-lateral faulting and northeast-southwest compression (thrust faulting) acting on this area are clearly pictured by your data. This is certainly not the spot that one would pick to locate a large-scale nuclear facility!

In reviewing the geological and seismic evidence available at the time of our SENOL meeting it seemed to me that the major seismic danger definitely lay with the Calaveras Sault to the west of the GETR. The major threat posed by a Verona Fault is that a large displacement (2-3 feet) might occur beneath and intersecting the base of the GETR reactor. Considering the thickness of sediments overlying basement rocks down dip to the northeast from the reactor site, this would seem to require a well-organized thrust fault surfacing directly beneath the reactor. The data now available on this point -- mainly the general lack of agreement among workers as to the precise location of the Verona Fault, the trenching in the reactor area, and the mix of strike slip and thrust faulting at various, perhaps random, depths throughout the area shown on your figure 8 -- suggest a response to the regional north-south compression by shearing on widely dispersed planes, rather than well-organized thrusting. The possibility that a major thrust would develop beneath the reactor, breaking through unsheared ground, seems to me to be exceedingly remote, and I therefore continue to believe that the overriding seismic danger which must be considered is that relating to the Calaveras Fault.

If you have not already done so, I hope you will send copies of your seismic analysis to Ben Page and George Thompson.

Cordially yours,

John C. Maxwell

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