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

June 27, 1985

The Honorable Edward Markey, Chairman
Subcommittee on Energy Conservation and Power
Committee on Energy and Commerce
United States House of Representatives
Washington, D.C. 20515

Dear Mr. Chairman:

Enclosed with this letter are the Commission's responses to your questions concerning the Diablo Canyon licensing process as requested in your letter of June 10, 1985.

Commissioner Asselstine adds that, since your questions are based on his letter to you, he has in effect already answered them. If he decides that additional responses to some of your questions are necessary, he will send those to you before the date of the rescheduled hearing.

Commissioner Zech adds the following:

I did not participate in the vote on the licensing of Diablo Canyon Unit 1 for full power operation. I did not do so because at that time, the time available to me as a Commissioner was simply not sufficient for me to satisfy myself that I had read, analyzed, and adequately reflected upon all the relevant material. I did participate, however, in the discussion and voted on the separate discrete issue of whether to initiate a rulemaking proceeding on the generic issue of the extent to which earthquakes should be considered in emergency planning.

Sincerely,

Nunzio J. Palladino

Attachment:
As stated

cc: The Honorable Carlos J. Moorhead

8507150447 850627
PDR COMMS NRCC
CORRESPONDENCE PDR

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LTR6/27 MARKEY

Responses cleared with all Commissioner Offices

OFC	:OCA	:SECY	:OCM	:OCM	:OCM	:OCM
NAME	:FAY	:COMBS	:WAMAGEE	:NMHALLER	:NJPALLADINO	
DATE	:6/27/85	:6/27/85	:6/27/85	:6/27/85	:6/27/85	:6/27/85

QUESTION 1.

THE COMMISSION MAJORITY'S FEBRUARY 25, 1985
LETTER STATES:

"THERE IS RECORD SUPPORT FOR THE COMMISSION
MAJORITY'S FINDING THAT THE DIABLO CANYON SITE IS
'AT MOST, ONE OF MODERATE SEISMICITY,' CLI-84-12
AT 8, J.A.S. AT 258. AS THE APPEAL BOARD NOTED
'THE REGION IS AT MOST ONE OF LOW TO MODERATE
SEISMICITY,' ALAB-664 [sic], 13 NRC 903, 994 (1981)."

(A) WHAT IS THE ON THE RECORD SUPPORT FOR THE
CONCLUSION OF THE COMMISSION AND ITS LICENSING
BOARDS THAT THE DIABLO CANYON SITE IS OF LOW TO
MODERATE SEISMICITY? PLEASE PROVIDE ANY CITATIONS
TO THAT ASPECT OF THE HEARING RECORD WHICH
SUPPORTS THE CONCLUSION OF THE COMMISSION AND
LICENSING BOARDS.

ANSWER.

THE APPEAL BOARD'S CONCLUSION THAT THE AREA IN WHICH DIABLO CANYON
IS LOCATED IS ONE OF "LOW TO MODERATE SEISMICITY" IS BASED ON A
PLOT (APPEAL BOARD EXH, 2J, FIG. 2) DEVELOPED BY DRS. ANDERSON AND
TRIFUNAC FOR THE YEARS 1950 THROUGH 1974 OF THE KNOWN EPICENTERS
IN THE REGION, CENTERED AROUND DIABLO CANYON, AND THE CALCULATED

QUESTION 1 (A) (CONTINUED - 2 -

LOW RECURRENCE RATE OF AN OBE AS WELL AS THE TESTIMONY OF PG&E WITNESS STEWART W. SMITH, FOL. TR. 5490 AT P. 14. ALAB-644, 13 NRC 903, 993, 994 (1981). ON THE BASIS OF THIS RECORD EVIDENCE, THE APPEAL BOARD REJECTED THE CLAIM THAT THE AREA WAS ONE OF HIGH SEISMICITY, FINDING INSTEAD THAT: "[T]HE RECORD, HOWEVER, DOES NOT BEAR OUT THE CLAIM THAT THE DIABLO CANYON SITE IS ONE OF 'HIGH SEISMICITY.'" Id.

THE PLOT DEVELOPED BY DRs. ANDERSON AND TRIFUNAC IS CONTAINED IN A REPORT ENTITLED "UNIFORM RISK ABSOLUTE ACCELERATION SPECTRA FOR THE DIABLO CANYON SITE, CALIFORNIA," DATED DECEMBER 30, 1976.

DR. STEWART W. SMITH TESTIFIED THAT

"[T]HE SOUTHERN COAST RANGE PROVINCE IN WHICH DIABLO CANYON IS LOCATED IS AN AREA OF LOW TO MODERATE SEISMICITY." SMITH, FOL. TR. 5490 AT P. 14.

QUESTION 1. (B) COMPARED TO OTHER REACTOR SITES, IS THE
DIABLO CANYON SITE OF LOW TO MODERATE
SEISMICITY?

ANSWER.

THE CHARACTERIZATION OF THE SEISMICITY AT THE DIABLO CANYON SITE AS "LOW TO MODERATE" WAS NOT BASED ON A COMPARISON WITH SEISMICITY AT OTHER REACTOR SITES. RATHER, THE APPEAL BOARD IN ITS SEISMIC DESIGN DECISION (ALAB-644), BASED ON ITS ANALYSIS OF THE EVIDENCE IN THE DIABLO CANYON RECORD, FOUND THAT THE DIABLO CANYON SITE DID NOT MEET THE PART 100, APPENDIX A DEFINITION OF "HIGH SEISMICITY".

QUESTION 1. (c) COMPARED TO OTHER REACTORS, IS DIABLO CANYON BUILT TO MORE OR LESS STRINGENT SEISMIC STANDARDS? SPECIFICALLY WHAT, IF ANY, REACTORS HAVE MORE STRINGENT SEISMIC DESIGN REQUIREMENTS?

ANSWER.

ALTHOUGH THEY ARE NOT EXACTLY THE SAME, THE DIABLO CANYON AND SAN ONOFRE UNIT 2 AND 3 FACILITIES HAVE BEEN DESIGNED AND CONSTRUCTED TO ACCOMMODATE THE MOST STRINGENT SEISMIC STANDARDS (GROUND MOTION) OF ALL U.S. REACTOR FACILITIES.

QUESTION 1. (D) WHAT IS THE COMMISSION MAJORITY'S RESPONSE TO COMMISSIONER ASSELSTINE'S CHARGE IN HIS MARCH 19, 1985 LETTER THAT: "IN BASING A DECISION ON A FINDING THAT THE DIABLO CANYON AREA IS ONE OF LOW TO MODERATE SEISMICITY, THE COMMISSION MISUNDERSTOOD WHAT THE LICENSING BOARD AND NRC STAFF EXPERTS MEANT BY THAT PHRASE."

ANSWER.

THE COMMISSION'S UNDERSTANDING OF THE PHRASE "LOW TO MODERATE" SEISMICITY WAS BASED ON THE APPEAL BOARDS'S DECISION IN ALAB-644, 13 NRC AT 992-94. THE APPEAL BOARD BASED ITS DECISION ON THE PLOT OF EARTHQUAKE ACTIVITY IN LICENSING BOARD EXHIBIT 2J, FIG. 2 AND THE CALCULATED LOW OCCURRENCE RATE OF AN EARTHQUAKE OF THE MAGNITUDE ASSIGNED TO THE OBE (THE LOWEST AVERAGE RETURN PERIOD COMPUTED WAS 275 YEARS). THE APPEAL BOARD ALSO FOUND THAT ITS DECISION WAS SUPPORTED BY THE SMITH TESTIMONY FOLLOWING TR, 5490 AT P.14. THE PLOT IN EXHIBIT 2J SHOWS THAT FEW EARTHQUAKES OCCURRED IN THE VICINITY OF DIABLO CANYON DURING THE PERIOD CONSIDERED. THE RECORD SHOWED THAT THE MINIMUM RECURRENCE TIME FOR THE OBE WAS 275 YEARS, WHICH WAS FOUND TO BE "WELL BEYOND" THE EXPECTED OPERATING LIFE OF THE PLANT. AND THE SMITH TESTIMONY STATES THAT "THE SOUTHERN COAST RANGE PROVINCE IN WHICH DIABLO CANYON IS LOCATED IS AN AREA OF LOW TO MODERATE SEISMICITY."

QUESTION 1 (D) (CONTINUED) - 2 -

THE COMMISSION MAJORITY PROVIDED A NUMBER OF ARGUMENTS TO SUPPORT ITS DIABLO CANYON DECISION ON SEISMIC CONSIDERATIONS IN EMERGENCY PLANNING (CL-84-12). THE COMMISSION MAJORITY BELIEVES THAT THOSE CONSIDERATIONS WERE RELEVANT TO THAT DECISION. HOWEVER, BY INITIATING RULEMAKING, THE COMMISSION RECOGNIZES THAT THIS IS A GENERIC ISSUE ON WHICH PUBLIC COMMENT SHOULD BE SOUGHT IN REACHING A FINAL COMMISSION POLICY POSITION.

QUESTION 2. PLEASE STATE THE FACTUAL BASIS FOR THE COMMISSION'S CONCLUSION THAT THE ISSUE OF SEISMIC COMPLICATIONS ON EMERGENCY RESPONSE SHOULD BE TREATED IN A GENERIC FASHION. PROVIDE A CHRONOLOGY OF THE VIEWS OF THE NRC STAFF AND THE ADVISORY COMMITTEE ON REACTOR SAFEGUARDS ON WHETHER THIS ISSUE IS GENERIC OR SITE SPECIFIC?

ANSWER.

IN ITS MEMORANDUM AND ORDER OF DECEMBER 8, 1981 PERTAINING TO SAN ONOFRE, CLI-81-33 (14 NRC 1091(1981)), THE COMMISSION NOTED THAT:

"A REVIEW OF THE RULEMAKING FILE ASSOCIATED WITH THE COMMISSION'S EMERGENCY PLANNING REGULATIONS (SEE 45 FR 55402; 44 FR 75167; 44 FR 41483) REVEALS THAT THE COMMISSION DID NOT ADDRESS THE QUESTION OF HOW THE CONSEQUENCES OF A SEVERE EARTHQUAKE WOULD INFLUENCE EMERGENCY PLANNING... THE CURRENT REGULATIONS ARE DESIGNED WITH THE FLEXIBILITY TO ACCOMMODATE A RANGE OF ONSITE ACCIDENTS, INCLUDING ACCIDENTS THAT MAY BE CAUSED BY SEVERE EARTHQUAKES. THIS DOES NOT, HOWEVER, MEAN THAT EMERGENCY PLANS SHOULD BE TAILORED TO ACCOMMODATE SPECIFIC ACCIDENT SEQUENCES OR THAT EMERGENCY PLANS MUST ALSO TAKE INTO ACCOUNT THE DISRUPTION IN IMPLEMENTATION OF OFFSITE EMERGENCY PLANS CAUSED BY SEVERE EARTHQUAKES."

THE COMMISSION CONCLUDED THAT:

"THE COMMISSION WILL CONSIDER ON A GENERIC BASIS WHETHER REGULATIONS SHOULD BE CHANGED TO ADDRESS THE POTENTIAL IMPACTS OF A SEVERE EARTHQUAKE ON EMERGENCY PLANNING."

FURTHER, IN ITS DECISION OF AUGUST 10, 1984 PERTAINING TO DIABLO CANYON (CLI-84-12), THE COMMISSION REAFFIRMED ITS 1981 SAN ONOFRE FINDING. IN PART III OF CLI-84-12 THE COMMISSION STATED THE FOLLOWING:

". WE BELIEVE THAT FURTHER GENERIC RULEMAKING EXPLORING THE EFFECTS OF EARTHQUAKES ON EMERGENCY PLANNING COULD BE USEFUL. IN PARTICULAR, THE COMMISSION BELIEVES THAT IT WILL BE USEFUL TO ADDRESS WHETHER THE POTENTIAL FOR SEISMIC IMPACTS ON EMERGENCY PLANNING IS A SIGNIFICANT ENOUGH CONCERN FOR LARGE PORTIONS OF THE NATION TO WARRANT THE AMENDMENT OF THE REGULATIONS TO SPECIFICALLY CONSIDER THOSE IMPACTS. THE CHIEF FOCUS OF THE RULEMAKING PROCEEDING WILL BE TO OBTAIN ADDITIONAL INFORMATION TO DETERMINE WHETHER, IN SPITE OF CURRENT INDICATIONS TO THE CONTRARY, COST EFFECTIVE REDUCTIONS IN OVERALL RISK MAY BE OBTAINED BY THE EXPLICIT CONSIDERATION OF SEVERE EARTHQUAKES IN EMERGENCY RESPONSE PLANNING. IN ADDITION RULEMAKING WOULD ALLOW A GREATER SPECTRUM OF PUBLIC PARTICIPATION IN THE RESOLUTION OF THIS MATTER ON A GENERAL, AS OPPOSED TO PLANT-SPECIFIC, BASIS.

WE PREVIOUSLY INDICATED IN SAN ONOFRE THAT THIS MATTER WOULD BE CONSIDERED ON A GENERIC BASIS. SOME TIME AGO THE NRC STAFF ADVISED US THAT, IN ITS VIEW, GENERIC CONSIDERATION WAS NOT NECESSARY. HOWEVER, WE WERE DIVERTED FROM THIS ISSUE BY THE PRESS OF OTHER IMPORTANT COMMISSION BUSINESS, AND WE TOOK NO ACTION IN RESPONSE TO THAT ADVICE. IN RETROSPECT, SINCE WE DISAGREE WITH THE NRC STAFF'S VIEW, WE SHOULD HAVE ACTED SOONER AND INITIATED RULEMAKING. THE NEED TO ADDRESS THIS ISSUE IN THIS CASE HAS AGAIN FOCUSED OUR ATTENTION ON THIS MATTER. BY THIS ORDER WE ARE INDICATING OUR DESIRE TO INITIATE RULEMAKING SHORTLY, AND DIRECTING THE NRC STAFF TO GIVE PRIORITY ATTENTION TO THIS MATTER."

THE STAFF EXPRESSED ITS VIEWS PERTAINING TO THE ISSUE ON THREE OCCASIONS: 1) A JUNE 22, 1982 MEMORANDUM FROM THE EXECUTIVE DIRECTOR FOR OPERATIONS (EDO) TO THE COMMISSION; 2) A JANUARY 13, 1984 MEMORANDUM FROM THE EDO TO THE CHAIRMAN; AND 3) THE MAY 3, 1984 NRC STAFF'S MEMORANDUM REGARDING CONSIDERATION OF EFFECTS OF EARTHQUAKES ON EMERGENCY PLANNING (CLI-84-4).

THE JUNE 22, 1982 MEMORANDUM STATED..."IT IS THE JUDGEMENT OF THE STAFF THAT FOR MOST SITES EARTHQUAKES NEED NOT BE EXPLICITLY CONSIDERED FOR EMERGENCY PLANNING PURPOSES BECAUSE OF THE VERY LOW LIKELIHOOD THAT AN EARTHQUAKE SEVERE ENOUGH TO DISTURB ONSITE OR OFFSITE PLANNED RESPONSES WILL OCCUR CONCURRENTLY WITH OR

CAUSE A REACTOR ACCIDENT." THE STAFF ALSO INDICATED THAT WHILE PLANNING FOR EARTHQUAKES WHICH MIGHT HAVE EMERGENCY PREPAREDNESS IMPLICATIONS MAY BE WARRANTED IN AREAS WHERE THE SEISMIC RISK TO OFFSITE STRUCTURES IS RELATIVELY HIGH (E.G., CALIFORNIA SITE AND OTHER AREAS OF THE WESTERN U.S.), CURRENT REVIEW CRITERIA ARE CONSIDERED ADEQUATE.

IN THE JANUARY 13, 1984 MEMORANDUM, THE STAFF CONCLUDED THAT:

- "A. IN GENERAL, EARTHQUAKES UP TO AND INCLUDING THE SSE ARE NOT EXPECTED TO POSE AN IMMEDIATE OFFSITE RADIOLOGICAL HAZARD.
- B. EARTHQUAKES BEYOND THE SSE MAY CAUSE PLANT DAMAGE AND RADIOACTIVE RELEASE UNDER CONDITIONS WHERE OFFSITE DAMAGE IMPAIRS EMERGENCY RESPONSE.
- C. FURTHER, CLARIFICATION OR REFINEMENT OF CURRENT REQUIREMENTS AND GUIDANCE MIGHT REDUCE THE IMPAIRMENT OF EMERGENCY RESPONSE INDICATED IN B ABOVE, BUT THE VALUE OF SUCH REDUCTION IS UNCERTAIN."

IN ITS RESPONSE TO CLI-84-4, THE STAFF STATED THAT "...BASED ON ITS CONSIDERATION OF THIS ISSUE, THE STAFF BELIEVES THAT THE CURRENT RESIDUAL RISK IS ACCEPTABLE AND THAT CONSIDERATION OF THE COMPLICATING EFFECTS OF EARTHQUAKES ON EMERGENCY PLANNING FOR DIABLO CANYON IS NOT REQUIRED."

THE VIEWS OF THE ACRS ON THIS SUBJECT WERE EXPRESSED ON TWO OCCASIONS: ON MARCH 16, 1981 AND JUNE 10, 1985. ON MARCH 16, 1981 THE ACRS RECOMMENDED THAT THE NRC STAFF GIVE FURTHER CONSIDERATION TO THE DEVELOPMENT OF EMERGENCY PLANS AND THE OPERABILITY OF EQUIPMENT NEEDED TO DEAL WITH NUCLEAR EMERGENCIES WHICH RESULT FROM NATURAL DISTURBANCES SUCH AS EARTHQUAKES.

IN ITS JUNE 10, 1985 LETTER TO THE COMMISSION, THE ACRS COMMENTED THAT IT SAW "... NO TECHNICAL REASON FOR THE EXCLUSION OF EARTHQUAKES FROM THE NATURAL PHENOMENA CONSIDERED IN OFFSITE EMERGENCY PLANNING FOR NUCLEAR POWER PLANTS. HOWEVER, WE BELIEVE THAT ONLY LIMITED CONSIDERATION OF EARTHQUAKES IS APPROPRIATE. FOR SITES WHERE AN EARTHQUAKE CAPABLE OF SEVERELY DAMAGING EMERGENCY TRAVEL ROUTES IS SUFFICIENTLY LIKELY TO OCCUR, THE LOCAL OFFSITE AUTHORITIES SHOULD HAVE THE BENEFIT OF STUDIES INDICATING THE TYPES AND POTENTIAL LOCATIONS OF SUCH DAMAGE. THE STUDY OF THIS KIND ALREADY PERFORMED FOR THE REGION SURROUNDING THE DIABLO CANYON SITE WOULD CLEARLY MEET THE INTENT OF THIS COMMENT." [THE REPORT REFERRED TO HERE IS THE TERA CORPORATION REPORT, "EARTHQUAKES AND EMERGENCY PLANNING AT DIABLO CANYON," SEPTEMBER, 1981.]

THE ACRS ALSO COMMENTED THAT "...IN THE ASSESSMENT OF THE IMPACT OF NATURAL EVENTS ON EMERGENCY PLANNING, THE MAJOR EFFORT SHOULD BE TO IDENTIFY POTENTIAL PROBLEMS AND TO DEVISE ALTERNATIVE APPROACHES FOR THEIR RESOLUTION. THIS WOULD INCLUDE REQUIREMENTS

FOR ASSURING APPROPRIATE MEANS FOR COMMUNICATION, FOR IDENTIFYING ALTERNATIVE ROUTES FOR THE EVACUATION OF THE LOCAL POPULATION, AND FOR IDENTIFYING CIRCUMSTANCES UNDER WHICH SHELTERING MIGHT BE A MORE EFFECTIVE RESPONSE THAN EVACUATION. IN MANY CASES, SUCH ASSESSMENTS MAY LEAD TO A DECISION THAT NO FURTHER RESPONSE OR ACTION IS REQUIRED. THE GOAL SHOULD BE TO ASSURE THAT EMERGENCY PLANS, AS DEVELOPED, CONTAIN SUFFICIENT FLEXIBILITY TO COPE WITH THE POTENTIAL ADDED IMPACTS OF SUCH EVENTS."

QUESTION 3. IN DECIDING NOT TO CONSIDER THE POSSIBLE COMPLICATING EFFECTS OF EARTHQUAKES ON EMERGENCY PREPAREDNESS IN ITS 1981 DECISION TO LICENSE SAN ONOFRE UNIT 2, THE COMMISSION STATED THAT IT WOULD INSTEAD CONSIDER THE ISSUE ON A GENERIC BASIS. THIS APPROACH WAS REPEATED IN THE COMMISSION'S 1984 DECISION TO LICENSE DIABLO CANYON. PLEASE EXPLAIN WHY THE COMMISSION APPARENTLY DID NOT ADDRESS THIS ISSUE IN A GENERIC FASHION IN THE INTERVENING YEARS AS ORIGINALLY PROPOSED AND PROVIDE ALL DOCUMENTS DETAILING ANY ACTIONS THAT WERE TAKEN.

ANSWER.

AS EXPLAINED IN PART III OF THE COMMISSION'S AUGUST 10, 1984 DECISION ON DIABLO CANYON (CLI-84-12), FOLLOWING THE NRC STAFF ADVICE TO THE COMMISSION THAT, IN ITS VIEW, GENERIC CONSIDERATION OF THIS ISSUE WAS NOT NECESSARY, THE COMMISSION WAS DIVERTED FROM THIS ISSUE BY THE PRESS OF OTHER IMPORTANT COMMISSION BUSINESS AND THE COMMISSION TOOK NO ACTION UNTIL THE DIABLO CANYON CASE REVIEW.

QUESTION 4. WHY DID THE NRC REQUIRE PACIFIC GAS & ELECTRIC TO PREPARE A REPORT ON THE COMPLICATING EFFECTS OF EARTHQUAKES ON EMERGENCY PREPAREDNESS--THE TERA REPORT--AND WHY DID THE NRC STAFF REQUIRE CALIFORNIA LICENSEES TO CONSIDER EARTHQUAKES SMALLER THAN THE SSE IN THEIR EMERGENCY PLANS, IF THIS ISSUE WAS NOT MATERIAL TO PUBLIC HEALTH AND SAFETY AND TO LICENSING DETERMINATIONS?

ANSWER.

SUBSEQUENT TO THE JULY 22, 1980 AND AUGUST 8, 1980 ERUPTIONS OF MT. ST. HELENS, VOLCANIC ERUPTIONS AND EARTHQUAKES BECAME ISSUES OF HIGH PUBLIC INTEREST. IN RESPONSE TO AN OCTOBER 9, 1980 MEMORANDUM FROM THE SECRETARY OF THE COMMISSION REGARDING THE CONSIDERATION OF VOLCANIC ACTIVITY IN THE TROJAN SITE AREA AND INTEREST EXPRESSED IN EARTHQUAKE HAZARDS AT CALIFORNIA SITES, THE NRC STAFF REQUESTED THAT APPLICANTS AND LICENSEES IN CALIFORNIA AND THE TROJAN PLANT IN OREGON PROVIDE ANALYSES OF THE IMPACT OF EARTHQUAKES OR VOLCANIC ERUPTIONS, AS APPROPRIATE, ON THEIR EMERGENCY PLANS. THE STAFF'S REQUESTS FOR THIS INFORMATION WERE MADE PRIOR TO THE COMMISSION'S DECISION IN DECEMBER 1981 IN THE SAN ONOFRE PROCEEDING THAT CONSIDERATION OF THE EFFECTS OF EARTHQUAKES ON EMERGENCY PLANNING WAS NOT REQUIRED.

QUESTION 5. WERE THE PARTIES TO THE DIABLO CANYON LICENSING PROCEEDING PROVIDED AN OPPORTUNITY TO CHALLENGE ON THE RECORD THE COMMISSION'S CONCLUSION THAT EMERGENCY PLANS FOR THE FACILITY ARE SUFFICIENTLY FLEXIBLE TO ALLOW FOR THE COMPLICATING EFFECTS OF AN EARTHQUAKE ON EMERGENCY RESPONSE. STATE THE FACTUAL BASIS FOR THE COMMISSION'S CONCLUSION THAT SUCH FLEXIBILITY EXISTS AND PROVIDE ANY CITATIONS TO THE ON THE RECORD PROCEEDING THAT SUPPORT THIS VIEW.

ANSWER.

IN CLI-84-12 THE COMMISSION FOUND THAT THE SCOPE OF EMERGENCY PLANS TO DEAL WITH THE VARIETY OF NATURAL PHENOMENA WHICH COULD INTERFERE WITH THEIR OPERATION IMPLIED SOME FLEXIBILITY TO DEAL WITH THE EFFECTS OF EARTHQUAKES. FOR EMERGENCY PLANNING PURPOSES IT DID NOT MATTER WHETHER AN IMPASSABLE ROAD WAS IMPASSABLE BECAUSE OF HEAVY FOG OR BECAUSE OF AN EARTHQUAKE. THE COMMISSION'S POSITION ON THIS MATTER WAS SIMPLY A LOGICAL INFERENCE DRAWN FROM THE UNDISPUTED EVIDENCE. FOR EXAMPLE, THE EFFECTS OF FOG AND HEAVY RAIN ON ROAD CAPACITY, AN ELEMENT OF EVACUATION TIME ANALYSIS, WERE CONSIDERED. OTHER IMPEDIMENTS, INCLUDING ROAD CONSTRUCTION AND ROAD BLOCKAGE, WERE ALSO LITIGATED. THESE MATERS ARE ADDRESSED IN THE TESTIMONY OF PG&E WITNESSES G. P. SMITH, JR. AND R. WINSLOW WHICH IS INCLUDED IN THE TRANSCRIPT OF THE HEARING FOLLOWING PAGE 12184 (AT PAGE 6-13)

AND TRANSCRIPT PAGES 12196 TO 12213. IN ADDITION, PG&E EXHIBITS 78 (EVACUATION TIME ASSESSMENT FOR DIABLO CANYON), 80 (SAN LUIS OBISPO COUNTY NUCLEAR POWER PLANT EMERGENCY RESPONSE PLAN, DRAFT, OCTOBER 1981), AND 84 (EVACUATION TIME ESTIMATES) ALSO ADDRESS POTENTIAL IMPEDIMENTS TO EVACUATION.

THE COMMISSION'S INFERENCE OF FLEXIBILITY WAS DRAWN FROM THE RECORD IN THE COURSE OF REACHING ITS OVERALL CONCLUSIONS. THE COMMISSISON IS LEGALLY FREE TO DRAW INFERENCES FROM EVIDENCE AND TESTIMONY IN THE RECORD.

QUESTION 6. WHAT WAS THE FACTUAL BASIS OF THE COMMISSION'S 1981 DECISION TO EXCLUDE CONSIDERATION OF SEISMIC COMPLICATIONS ON EMERGENCY RESPONSE IN THE SAN ONOFRE LICENSING PROCEEDING?

ANSWER.

IN ITS DECISION IN THE SAN ONOFRE PROCEEDING (CLI-81-33), THE COMMISSION DETERMINED THAT CONSIDERATION OF THE COMPLICATING EFFECTS OF EARTHQUAKES ON EMERGENCY PLANNING WAS NOT REQUIRED BASED ON ITS REVIEW OF THE RULE AS WRITTEN AND THE RECORD ASSOCIATED WITH THE EMERGENCY PLANNING RULEMAKING. FURTHERMORE, THE COMMISSION'S CONCLUSION THAT "THE PROXIMATE OCCURRENCE OF AN ACCIDENTAL RADIOLOGICAL RELEASE AND AN EARTHQUAKE THAT COULD DISRUPT NORMAL EMERGENCY PLANNING APPEARS SUFFICIENTLY UNLIKELY THAT CONSIDERATION IN INDIVIDUAL LICENSING PROCEEDINGS PENDING GENERIC CONSIDERATION OF THE MATTER IS NOT WARRANTED," IS SUPPORTED BY THE AFFIDAVIT OF MR. BRIAN K. GRIMES, THEN DIRECTOR, DIVISION OF EMERGENCY PREPAREDNESS, NRC OFFICE OF INSPECTION AND ENFORCEMENT. MR. GRIMES' AFFIDAVIT WAS ATTACHED TO "NRC STAFF VIEWS WITH RESPECT TO QUESTIONS POSED BY ATOMIC SAFETY AND LICENSING BOARD IN THE AREA OF EMERGENCY PLANNING" FILED BEFORE LICENSING BOARD IN THE SAN ONOFRE PROCEEDING ON JUNE 22, 1981.

QUESTION 7. WHAT, IF ANY, ANALYSIS WAS CONDUCTED BY THE COMMISSION OR ITS STAFF TO ESTABLISH WHETHER AN EARTHQUAKE SMALLER THAN THE SSE COULD INITIATE AN ACCIDENT REQUIRING THE IMPLEMENTATION OF THE DIABLO CANYON EMERGENCY PREPAREDNESS PLAN? PLEASE PROVIDE ANY CITATIONS TO THE ON THE RECORD PROCEEDING ON THIS ISSUE.

ANSWER

THE COMMISSION'S DECISION WAS BASED ON THE ENTIRE RECORD OF THE HEARINGS BEFORE THE LICENSING AND APPEAL BOARDS, WHICH INCLUDED EXTENSIVE CONSIDERATION OF THE SEISMIC DESIGN OF DIABLO CANYON, AND IS CONFIRMED BY THE STAFF ANALYSIS CONTAINED IN THE MEMORANDA WHICH WERE ATTACHED TO CLI-84-4 AND SERVED ON THE PARTIES. THAT ANALYSIS RELIED ON ENGINEERING JUDGMENT, WHICH CONSIDERED THE AVAILABLE SEISMIC RESEARCH. NO SPECIFIC PROBABILISTIC ANALYSIS WAS CONDUCTED.

THE SAFE SHUTDOWN EARTHQUAKE, OR SSE, FOR A NUCLEAR PLANT IS BASED UPON AN EVALUATION OF THE MAXIMUM EARTHQUAKE POTENTIAL FOR THE SPECIFIC SITE. THE SSE IS EVALUATED AS THAT EARTHQUAKE WHICH PRODUCES THE MAXIMUM VIBRATORY GROUND MOTION FOR WHICH CERTAIN STRUCTURES, SYSTEMS AND COMPONENTS MUST BE DESIGNED AND CONSTRUCTED TO REMAIN FUNCTIONAL. PROBABILISTIC ESTIMATES FOR THE OCCURRENCE OF AN SSE ARE TYPICALLY ON THE ORDER OF ONE IN A THOUSAND TO ONE IN TEN THOUSAND PER YEAR. BECAUSE OF THE SHORT

HISTORY IN THE U.S., IN COMPARISON TO THE RETURN PERIOD OF LARGE EARTHQUAKES, AMONG OTHER FACTORS, THESE ESTIMATES MAY HAVE LARGE UNCERTAINTIES. ALL STRUCTURES, SYSTEMS AND COMPONENTS NECESSARY TO ACHIEVE A SAFE SHUTDOWN ARE SEISMICALLY QUALIFIED FOR THE SSE AND ARE EXPECTED, WITH HIGH CONFIDENCE, TO FUNCTION TO BRING THE PLANT TO A SAFE SHUTDOWN.

WITH THESE STRUCTURES, SYSTEMS AND COMPONENTS FUNCTIONING PROPERLY, ONLY IN THE EVENT OF MULTIPLE UNRELATED FAILURES OF SAFETY RELATED SYSTEMS DUE TO SOME UNDISCOVERED COMMON CAUSE FAILURE MECHANISM (SUCH AS A MAJOR DESIGN ERROR), COINCIDENT WITH A SEVERE EARTHQUAKE UP TO A SEVERITY OF AN SSE, WOULD THERE BE A CHANCE OF AN ACCIDENT WHICH WOULD REQUIRE OFFSITE EMERGENCY RESPONSE. THE PROBABILITY OF THESE TWO EVENTS OCCURRING PROXIMATELY IN TIME IS VERY MUCH LOWER THAN THE PROBABILITY OF EITHER INDIVIDUAL EVENT.

THE NECESSARY STRUCTURES, SYSTEMS AND COMPONENTS OF THE DIABLO CANYON PLANT WERE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH ALL THE APPROPRIATE NRC REQUIREMENTS TO PERFORM THEIR INTENDED FUNCTION DURING AND FOLLOWING AN EARTHQUAKE OF A MAGNITUDE UP TO THE SSE.

QUESTION 8. WHAT IS THE BASIS FOR THE CONCLUSION OF THE COMMISSION THAT AN EARTHQUAKE SMALLER THAN THE SSE REQUIRING EMERGENCY RESPONSE IS LESS LIKELY THAN OTHER ACCIDENT INITIATORS REQUIRING EMERGENCY RESPONSE? PLEASE PROVIDE ANY CITATIONS TO THE ON THE RECORD PROCEEDING THAT SUPPORT THE COMMISSION'S POSITION.

ANSWER.

THE COMMISSION DECISION DOES NOT REST ON A COMPARISON OF THE RELATIVE PROBABILITIES OF NATURAL PHENOMENA AS ACCIDENT INITIATORS. RATHER, THE COMMISSION DECISION IS BASED ON THE RECORD MATERIAL WHICH SHOWS THAT THE PROBABILITY THAT AN EARTHQUAKE WILL INITIATE AN ACCIDENT OR OCCUR COINCIDENT IN TIME WITH A NON-SEISMIC ACCIDENT INITIATOR IS SO LOW THAT THE COMPLICATING EFFECTS OF EARTHQUAKES ON EMERGENCY PLANNING NEED NOT BE SEPARATELY LITIGATED. THIS RECORD MATERIAL INCLUDES THE UNUSUALLY EXTENSIVE REVIEW OF THE ADEQUACY OF THE SEISMIC DESIGN OF DIABLO CANYON AND THE CONCLUSION THAT THE PROBABILITY OF OCCURRENCE OF A SIGNIFICANT EARTHQUAKE (I.E. AND EARTHQUAKE CAUSING A GROUND ACCELERATION AT OR ABOVE THAT WHICH WOULD BE CAUSED BY THE OPERATING BASIS EARTHQUAKE) IN THE VICINITY OF THE PLANT IS LOW. ALAB-644, 13 NRC 903, 989-994 (1981). HAD A SIMILAR RECORD FOR OTHER NATURAL PHENOMENA BEEN BEFORE THE COMMISSION, AND HAD THE PARTIES RAISED THE ISSUE OF CONSIDERING THE COMPLICATING EFFECTS OF THOSE OTHER NATURAL PHENOMENA THE COMMISSION COULD HAVE CONSIDERED WHETHER THE COMPLICATING EFFECTS OF THOSE NATURAL PHENOMENA SHOULD BE LITIGATED.

QUESTION 9.

PLEASE STATE WHETHER THE COMMISSION BELIEVES THAT, FOR THE DIABLO CANYON PLANT, THE SIMULTANEOUS OR PROXIMATE OCCURRENCE OF A MAJOR EARTHQUAKE AND A RADIOLOGICAL EMERGENCY IS LESS PROBABLE THAN THE SIMULTANEOUS OR PROXIMATE OCCURRENCE OF A HURRICANE AND A RADIOLOGICAL EMERGENCY, A TORNADO AND A RADIOLOGICAL EMERGENCY OR A VOLCANIC ERUPTION AND A RADIOLOGICAL EMERGENCY. STATE THE FACTUAL BASIS FOR THE COMMISSION'S VIEW AND PROVIDE ANY CITATIONS TO THE ON THE RECORD PROCEEDING THAT SUPPORT THE COMMISSION'S POSITION.

ANSWER.

AS DISCUSSED ABOVE, THE COMMISSION'S DECISION DID NOT REST ON A COMPARISON OF THE RELATIVE PROBABILITIES OF NATURAL PHENOMENA AS ACCIDENT INITIATORS.

QUESTION 10: THE COMMISSION'S BRIEF FOR THE RESPONDENTS BEFORE THE U.S. COURT OF APPEALS STATED THAT "WHEN THE RELEVANT PROBABILITIES ARE CONSIDERED, THE COMMISSION'S DECISION IS WELL SUPPORTED."

- (A) SPECIFICALLY WHAT RELEVANT PROBABILITIES DID THE COMMISSION CONSIDER?
- (B) WHAT RELEVANT PROBABILITIES ARE PART OF THE RECORD PROCEEDING? PLEASE PROVIDE ANY CITATIONS.

ANSWER:

THE "RELEVANT PROBABILITIES" CONSIDERED BY THE COMMISSION, AND THE RECORD SUPPORT FOR THEM, WERE:

- (1) THE LOW PROBABILITY THAT AN EARTHQUAKE UP TO AND INCLUDING THE SAFE SHUTDOWN EARTHQUAKE (SSE) COULD RESULT IN A RADIOLOGIC RELEASE.

THE CONCLUSION THAT THIS PROBABILITY IS LOW IS SUPPORTED BY THE ENTIRE RECORD OF THE ADEQUACY OF THE SEISMIC DESIGN, A RECORD WHICH IS UNUSUALLY EXTENSIVE IN THIS CASE. AMONG OTHER THINGS, THAT RECORD SHOWS THAT THE VALUE OF THE SSE USED TO DESIGN THE PLANT IS VERY CONSERVATIVE. LBP - 79-26, 10 NRC AT 478-85 (1979) THIS CONSERVATISM IN THE PLANT'S SEISMIC DESIGN BASIS

IMPLIES A CORRESPONDING CONSERVATISM IN THE EVALUATION OF THE PLANT'S CAPABILITY OF SUCCESSFULLY WITHSTANDING THE EFFECTS OF AN EARTHQUAKE.

- (2) THE LOW PROBABILITY OF AN EARTHQUAKE EXCEEDING THE SSE.

THE RECORD CONTAINS DATA ON EARTHQUAKE MAGNITUDES AND FREQUENCIES IN THE VICINITY AROUND DIABLO CANYON. THAT DATA SHOWS THAT THERE IS AN INVERSE RELATION BETWEEN EARTHQUAKE MAGNITUDE AND THE FREQUENCY OF EARTHQUAKE OCCURRENCE--THE LARGER THE EARTHQUAKE, THE LESS FREQUENTLY IT WILL OCCUR. CALCULATIONS IN THE RECORD SHOW THAT 275 YEARS IS THE SHORTEST INTERVAL BETWEEN CONSECUTIVE OCCURRENCES OF AN EARTHQUAKE RESULTING IN A GROUND ACCELERATION OF 0.2G, THE OPERATING BASIS EARTHQUAKE (OBE) FOR THIS PLANT, ALAB-644, 13 NRC AT 992 (1981). THE PROBABILITY OF OCCURRENCE OF AN EARTHQUAKE IS RELATED TO THE INTERVAL BETWEEN CONSECUTIVE OCCURRENCES, ALSO KNOWN AS THE RETURN PERIOD. THE DATA IN THE DIABLO CANYON RECORD SHOWS THAT THE RETURN PERIOD FOR AN EARTHQUAKE HAVING THE MAGNITUDE OF THE SSE, AN EARTHQUAKE RESULTING IN A GROUND ACCELERATION OF 0.75G, IS MUCH GREATER THAN FOR AN EARTHQUAKE HAVING THE MAGNITUDE OF THE OBE. FOR EXAMPLE, THE RECORD SHOWS THAT THE AVERAGE RETURN PERIOD FOR A MAGNITUDE 6.5 EARTHQUAKE ON THE SECTION OF THE

HOSGRI ADJACENT TO DIABLO CANYON, AN EARTHQUAKE TEN TIMES SMALLER THAN THE SSE, IS ABOUT 1,000 YEARS. LBP - 79-26, 10 NRC AT 482 (1979). FURTHERMORE, PG&E WITNESS JOHN A. BLUME TESTIFIED THAT IF A 7.5 MAGNITUDE EARTHQUAKE IS CONSIDERED POSSIBLE ON THE HOSGRI FAULT, AN EFFECTIVE ACCELERATION OF 0.75G WOULD HAVE AN AVERAGE RETURN PERIOD OF ROUGHLY 100,000 YEARS. LBP - 79-26, 10 NRC AT 489 (1979). BECAUSE THE RECORD SHOWS THAT RETURN PERIODS INCREASE WITH INCREASING EARTHQUAKE MAGNITUDE, THE RECORD ALSO SHOWS THAT THE RETURN PERIOD OF AN EARTHQUAKE HAVING A MAGNITUDE EXCEEDING THE SSE IS GREATER STILL AND, THUS, THAT THE PROBABILITY OF AN EARTHQUAKE EXCEEDING THE SSE IS LOW. INDEED, A FUNDAMENTAL PREMISE OF SEISMIC DESIGN IS THAT THE SSE IS THE BASIS FOR DESIGN BECAUSE OF THE LOW PROBABILITY OF OCCURRENCE OF AN EARTHQUAKE EXCEED THE SSE.

- (3) THE VERY LOW PROBABILITY OF THE CONTEMPORANEOUS OCCURRENCE OF AN EARTHQUAKE LARGE ENOUGH TO AFFECT THE EMERGENCY PLAN AND AN INDEPENDENTLY CAUSED ACCIDENT LEADING TO A RADIOLOGIC RELEASE.

AS DISCUSSED ABOVE, THE RECORD CONTAINS CALCULATIONS SHOWING THAT THE SHORTEST RETURN TIME OF AN EARTHQUAKE RESULTING IN A GROUND MOTION OF 0.2G IS 275 YEARS AND DATA SHOWING THAT THE RETURN INTERVAL OF LARGER

EARTHQUAKES IS EVEN LONGER. THUS, THE RECORD SHOWS THAT THE LARGER THE EARTHQUAKE, THE LOWER THE PROBABILITY OF ITS OCCURRENCE. AND THE ENTIRE RECORD ON THE ADEQUACY OF THE PLANT'S DESIGN TO WITHSTAND ALL DESIGN BASIS ACCIDENTS SUPPORTS THE FINDING THAT THERE IS A LOW PROBABILITY OF A NON-EARTHQUAKE CAUSED ACCIDENT WHICH WILL LEAD TO A RADIOLOGIC RELEASE. THUS, THE RECORD SUPPORTS THE CONCLUSION THAT THE PRODUCT OF THE PROBABILITIES OF THE CONTEMPORANEOUS OCCURRENCE OF AN EARTHQUAKE LARGE ENOUGH TO INTERFERE WITH EMERGENCY PLANNING AND AN UNRELATED RADIOLOGIC EMERGENCY IS VERY LOW.

QUESTION 10: THE COMMISSION'S BRIEF FOR THE RESPONDENTS BEFORE THE U.S. COURT OF APPEALS STATED THAT "WHEN THE RELEVANT PROBABILITIES ARE CONSIDERED, THE COMMISSION'S DECISION IS WELL SUPPORTED."

- (C) DOES THE COMMISSION AGREE WITH THE ASSERTIONS OF THE GENERAL COUNSEL DURING THE COMMISSION DELIBERATIONS THAT THERE IS "NO CONVINCING RATIONAL BASIS FOR THE COMMISSION'S VIEW THAT THE COMPLICATING EFFECTS OF EARTHQUAKES ON EMERGENCY RESPONSE DESERVES NO CONSIDERATION." IF THE COMMISSION DOES NOT AGREE, WHAT IS THE BASIS FOR SUCH DISAGREEMENT? PLEASE PROVIDE ANY CITATIONS TO THE FACTUAL ON THE RECORD PROCEEDING THAT SUPPORT THE COMMISSION'S POSITION.

ANSWER:

CONTRARY TO THE UNDERLYING ASSUMPTION OF THIS QUESTION, THE GENERAL COUNSEL'S STATEMENT DID NOT REFER TO THE COMMISSION'S DECISION IN DIABLO CANYON. RATHER, THE QUOTED STATEMENT BY THE GENERAL COUNSEL REFERS TO HIS ASSESSMENT OF RELYING SOLELY ON THE PRIOR DECISION ON THE SAME ISSUE IN THE SAN ONOFRE PROCEEDING, TO REACH THE SAME CONCLUSION IN THE DIABLO CANYON PROCEEDING. CLI-81-83, 14 NRC 1091 (1981) THE COMMISSION TOOK THE GENERAL COUNSEL'S ADVICE TO RE-EXAMINE IN THE DIABLO CANYON PROCEEDING THE

ISSUE OF THE COMPLICATING EFFECTS OF EARTHQUAKES ON EMERGENCY PLANNING. THE COMMISSION BELIEVES THAT THE RECORD OF THE DIABLO CANYON PROCEEDING AMPLY SUPPORTS THE COMMISSION'S DECISION. THE GENERAL COUNSEL'S BRIEF TO THE D.C. CIRCUIT SUPPORTS THE RATIONALITY OF THE DIABLO CANYON DECISION REACHED BY THE COMMISSION.

QUESTION 11: DOES THE COMMISSION BELIEVE THAT A POTENTIAL LICENSING DELAY THAT COULD RESULT FROM THE PUBLIC HEARING PROCESS IS A RELEVANT CONSIDERATION IN THE COMMISSION'S DELIBERATIONS OF WHETHER A CONTESTED SAFETY ISSUE IS MATERIAL TO A LICENSING DECISION?

ANSWER:

THE COMMISSION BELIEVES THAT A POTENTIAL LICENSING DELAY THAT COULD RESULT FROM THE PUBLIC HEARING PROCESS IS CLEARLY NOT A RELEVANT CONSIDERATION IN THE DETERMINATION OF WHETHER AN ISSUE IS MATERIAL TO A LICENSING DECISION. HOWEVER, THE COMMISSION REASONABLY CAN TAKE INTO ACCOUNT THE AVOIDANCE OF UNNECESSARY DELAY IN DETERMINING HOW TO STRUCTURE ITS PROCEEDING TO MEET THE REQUIREMENTS OF THE ATOMIC ENERGY ACT AND THE NRC REGULATIONS.

QUESTION 12: DID THE COMMISSION CONSIDER OR RELY ON
EXTRA-RECORD INFORMATION IN ITS DELIBERATIONS
CONCERNING ISSUANCE OF A DIABLO CANYON FULL POWER
LICENSE.

ANSWER:

TO THE EXTENT THAT A COMMISSION DECISION ON FULL-POWER OPERATING
LICENSE CONCERNS UNCONTESTED ISSUES, THE COMMISSION MAY, AND
DOES, RELY ON ANY AVAILABLE INFORMATION. AS FOR CONTESTED
ISSUES, SUCH AS THE EFFECTS OF EARTHQUAKES ON EMERGENCY PLANNING
AT DIABLO CANYON, THE COMMISSION'S DECISION RELIED ONLY ON
INFORMATION IN THE RECORD AND REASONABLE INFERENCES FROM THAT
INFORMATION. THE COMMISSION'S DECISION DID NOT RELY ON ANY
EXTRA-RECORD MATERIAL. WHILE THE COMMISSION'S DISCUSSIONS AT
THE CLOSED MEETINGS INCLUDED THE MATERIAL SERVED ON THE PARTIES
WITH CLI-84-4, THE COMMISSION'S DECISION DID NOT RELY ON THAT
MATERIAL BECAUSE IT CORROBORATED EVIDENCE IN THE ADJUDICATORY
RECORD OR INFERENCES FROM THAT EVIDENCE.

QUESTION 13. PLEASE PROVIDE A LISTING OF ALL SCHEDULE SLIP-PAGES AND LICENSING DELAYS SINCE THE ISSUANCE OF THE CONSTRUCTION PERMIT AT DIABLO CANYON. THIS SHOULD INDICATE THE CAUSE AND LENGTH OF EACH DELAY.

ANSWER.

THROUGHOUT THE DIABLO CANYON PROJECT DELAYS OCCURRED IN THE PACIFIC GAS AND ELECTRIC (PG&E) SCHEDULE AS WELL AS IN THE NRC LICENSING SCHEDULE. PG&E NORMALLY INFORMED THE NRC STAFF OF THEIR DELAYS WHICH THEN WERE CONSIDERED BY US WITH RESPECT TO OUR SCHEDULE FOR LICENSING ACTIVITIES. HOWEVER, WE DO NOT NORMALLY MONITOR SCHEDULE DELAYS BY APPLICANTS OR LICENSEES, AND THEREFORE WE CANNOT PROVIDE YOU WITH SUCH INFORMATION.

DELAYS WERE CAUSED, IN GENERAL, BY NEW INFORMATION WHICH BECAME AVAILABLE DURING THE REVIEW PROCESS AND IMPACTED THE NRC REVIEW AND LICENSING PROCESS AS WELL AS THE PG&E SCHEDULE. WE CANNOT RECONSTRUCT AN ACCURATE HISTORY OF OUR LICENSING SCHEDULE AND DELAYS FOR THE DIABLO CANYON PLANT. HOWEVER, SINCE THE ISSUANCE OF THE UNIT 1 CONSTRUCTION PERMIT IN APRIL 1968 FIVE ISSUES RESULTED IN SCHEDULE DELAYS AS DISCUSSED BELOW WITH RESPECT

TO DIABLO CANYON UNIT 1. THE PG&E AND THE NRC SCHEDULE FOR UNIT 2 WAS AT ALL TIMES APPROXIMATELY ONE TO ONE AND ONE HALF YEARS BEHIND THE UNIT 1 SCHEDULE (UNIT 2 CONSTRUCTION PERMIT WAS ISSUED IN DECEMBER 1970).

1. HOSGRI FAULT CONSIDERATIONS

IN AUGUST 1973 PG&E SUBMITTED THE DIABLO CANYON UNITS 1 AND 2 FINAL SAFETY ANALYSIS REPORT (FSAR) FOR OUR DETERMINATION OF WHETHER THE FSAR WAS SUFFICIENTLY COMPLETE TO INITIATE A DETAILED OPERATING LICENSE (OL) REVIEW. DURING THIS ACCEPTANCE REVIEW THE STAFF BECAME AWARE FOR THE FIRST TIME OF THE EXISTENCE OF THE HOSGRI FAULT. THE FSAR WAS DOCKETED IN OCTOBER 1973. AT THAT TIME THE NRC SCHEDULE FOR ISSUANCE OF A FULL-POWER LICENSE WAS NOVEMBER 1974.

IT SOON BECAME APPARENT THAT THE NOVEMBER 1974 SCHEDULE WAS NOT ACHIEVABLE. PG&E SUBMITTED EXTENSIVE DETAILED INFORMATION ON THE HOSGRI FAULT WHICH RESULTED IN FURTHER QUESTIONS BY THE STAFF AND SITE EXPLORATION. A SECOND SUBMITTAL WAS MADE IN THE FALL OF 1975. IN APRIL 1976 THE NRC STAFF CONCLUDED THAT A SEISMIC EVENT OF MAGNITUDE 7.5 M, ORIGINATING AT THE HOSGRI FAULT NEAR THE SITE, IS THE APPROPRIATE DESIGN BASIS EARTHQUAKE FOR THE DIABLO CANYON PLANT.

PG&E COMPLETED THE NECESSARY REDESIGN AND ANALYSIS FOR THE HOSGRI EVENT AND THE STAFF COMPLETED ITS EVALUATION BY LATE 1978. THE DIABLO CANYON SEISMIC DESIGN WAS THE SUBJECT OF HEARINGS BY THE ATOMIC SAFETY AND LICENSING BOARD FROM LATE 1978 TO EARLY 1979. ABSENT ANY OTHER CONSIDERATIONS WE FIND THAT AN OPERATING LICENSE FOR DIABLO CANYON UNIT 1 COULD HAVE BEEN ISSUED IN ABOUT JUNE 1979.

2. THREE MILE ISLAND ACCIDENT

AS A RESULT OF THE TMI ACCIDENT IN MARCH 1979 WE TEMPORARILY SUSPENDED THE ISSUANCE OF OPERATING LICENSES. THIS IMMEDIATELY IMPACTED THE SCHEDULE FOR DIABLO CANYON UNIT 1. WHEN WE RESUMED THE ISSUANCE OF OPERATING LICENSES IN EARLY 1980 WE LIMITED SUCH LICENSES TO LOW-POWER OPERATIONS (SEQUOYAH WAS THE FIRST FACILITY TO RECEIVE SUCH A LICENSE). ONLY AFTER SUFFICIENT AND SATISFACTORY OPERATION AT LOW-POWER LEVELS DID WE THEN ISSUE A FULL-POWER LICENSE. THIS APPROACH IS STILL APPLIED TODAY. IN MID 1979 DIABLO CANYON WAS IDENTIFIED AS ONE OF SEVEN NEAR TERM OPERATING LICENSES (NTOLs) TO COMPLETE THE TMI ACTION ITEMS IN THE NEAR TERM FOR ISSUANCE OF A LOW POWER LICENSE.

3. SEISMICALLY INDUCED SYSTEM INTERACTIONS

AS A RESULT OF THE TMI ACCIDENT WE ALSO REQUIRED FURTHER EVALUATIONS DIRECTED TO THE POSSIBLE INTERACTIONS OF NONSAFETY AND SAFETY-GRADE SYSTEMS DURING NORMAL OPERATIONS AS WELL AS DURING TRANSIENTS AND ACCIDENTS. IN RESPONSE TO A RECOMMENDATION BY THE

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS (ACRS) IN NOVEMBER 1979, PG&E DEVELOPED A PROGRAM TO EVALUATE SUCH SYSTEMS INTERACTIONS, IN PARTICULAR AS INDUCED BY SEISMIC EVENTS AND COMMITTED TO COMPLETE THE PROGRAM PRIOR TO FULL-POWER OPERATION. PG&E IDENTIFIED AND COMPLETED ALL NECESSARY MODIFICATIONS BY LATE 1984.

4. INDEPENDENT DESIGN VERIFICATION PROGRAM

THE LOW-POWER LICENSE FOR UNIT 1 WAS ISSUED IN SEPTEMBER 1981. SHORTLY THEREAFTER PG&E DETERMINED AND INFORMED THE STAFF THAT AN EQUIPMENT LAYOUT DRAWING FOR UNIT 2 HAD BEEN USED IN THE ANALYSIS OF UNIT 1. AS A RESULT, THE STAFF RAISED QUESTIONS REGARDING THE DESIGN QUALITY ASSURANCE APPLIED TO THE DIABLO CANYON PROJECT. IN NOVEMBER 1981 WE SUSPENDED THE UNIT 1 LICENSE PENDING THE SATISFACTORY COMPLETION OF AN INDEPENDENT DESIGN VERIFICATION PROGRAM (IDVP) FOR THE SEISMIC DESIGN. THE STAFF REQUIRED FURTHER INDEPENDENT DESIGN VERIFICATION OF ALL OTHER DESIGN ASPECTS PRIOR TO ISSUANCE OF A FULL-POWER LICENSE. THE IDVP FOR THE SEISMIC AND NON-SEISMIC DESIGN WAS COMPLETED IN LATE 1983. THE MODIFICATIONS WERE COMPLETED IN EARLY 1984 AND IN APRIL 1984 WE COMPLETED REINSTATEMENT OF THE DIABLO CANYON UNIT 1 LOW-POWER LICENSE. THE FULL-POWER LICENSE WAS ISSUED IN NOVEMBER 1984 AFTER THE U. S. COURT OF APPEALS LIFTED ITS STAY ON THE ISSUANCE OF THE LICENSE.

5. ALLEGATIONS

SINCE EARLY 1983 NUMEROUS ALLEGATIONS WERE MADE REGARDING THE DESIGN, CONSTRUCTION, OPERATION AND MANAGEMENT OF THE DIABLO CANYON NUCLEAR POWER PLANT. THESE ALLEGATIONS WERE MADE BY A VARIETY OF SOURCES, PRIMARILY BY EMPLOYEES OF PG&E CONTRACTORS AND SUBCONTRACTORS. AS OF TODAY IN EXCESS OF 1700 ALLEGATIONS HAVE BEEN MADE. OUR STAFF HAS SCREENED EACH OF THESE ALLEGATIONS AND PG&E WAS REQUESTED TO PROVIDE ADDITIONAL INFORMATION. IN PARTICULAR, IN THE AREA OF PIPING AND PIPE SUPPORT WE CONDUCTED IN EARLY 1984 AN EXTENSIVE EVALUATION EFFORT, INCLUDING AUDITS AND SYSTEM WALKDOWNS AT THE PLANT (A SIMILAR EFFORT WAS PERFORMED LATER FOR UNIT 2).

6. JUDICIAL STAY

THE COMMISSION ISSUED A FULL-POWER LICENSE FOR DIABLO CANYON UNIT 1 IN AUGUST 1984. SUBSEQUENTLY, THAT LICENSE WAS STAYED BY THE D.C. CIRCUIT COURT UNTIL THE COURT DISSOLVED THE STAY ON OCTOBER 31, 1984.

IN SUMMARY, FOR DIABLO CANYON UNIT 1 A DELAY OF TEN YEARS OCCURRED FROM NOVEMBER 1974, AS HAD BEEN SCHEDULED WHEN THE OL APPLICATION WAS DOCKETED, TO DECEMBER 1984, WHEN THE FULL-POWER LICENSE WAS ISSUED. IT IS DIFFICULT TO DETERMINE THE EXACT IMPACT EACH OF THE

ABOVE ISSUES HAD ON THE OVERALL COMPLETION FOR THE DIABLO CANYON PLANT. HOWEVER, IT IS REASONABLE TO CONCLUDE THAT THE HOSGRI FAULT AND THE INDEPENDENT DESIGN VERIFICATION PROGRAM WERE THE MAJOR CONTRIBUTORS TO THE DELAY.