November 19, 1997

72.22

MEMORANDUM TO: Charles J. Haughney, Acting Director
Spent Fuel Project Office
Office of Nuclear Material Safety
and Safeguards

FROM: Mark S. Delligatti, Senior Project Manager
Spent Fuel Licensing Section
Spent Fuel Project Office
Office of Nuclear Material Safety
and Safeguards

SUBJECT: SUMMARY OF NOVEMBER 6, 1997, MEETING BETWEEN THE NUCLEAR REGULATORY COMMISSION, HOLTEC INTERNATIONAL, AND PACIFIC GAS AND ELECTRIC

Staff from the Nuclear Regulatory Commission met with representatives of Holtec International (Holtec) and Pacific Gas and Electric (PG&E) on November 6, 1997, at NRC Headquarters in Rockville, Maryland. The purpose of the meeting was to discuss Holtec's proposal to submit a topical report regarding use of the Hi-Star and Hi-Storm Cask systems at sites with high levels of seismic activity. Also attending the meeting were representatives of Northern States Power, Private Fuel Storage, Booz Allen, the Ibex group, and a member of the public. An attendance list is included as Attachment 1. This meeting was noticed on October 22, 1997. Attachment 2 was used by PG&E in its presentation. Attachment 3 contains the slides used by Holtec in its presentation.

In the open session of the meeting, PG&E discussed its experience in constructing and operating nuclear facilities in high-seismic areas. Holtec discussed its perception that, since all of the currently anticipated large centralized storage facilities are in high-seismic areas, there is a general need for a topical report to address cask usage at such sites. Holtec also discussed its proposed schedule for submitting the topical report to NRC. Holtec's current plans are to complete an outline of the topical report by March 1998. In a closed session after the open meeting, proprietary information associated with Holtec's approach to demonstrating compliance with the applicable regulatory requirements was discussed.

Attachments: 1. Attendance List
2. PG&E Slides
3. Holtec Slides

Dockets 72-1008
71-9261
72-1014

Distribution w/attachments:

Dockets	NRC File Center	PUBLIC	NMSS R/F	SFPO R/F
SFLS R/F	PEng	SFShankman	TMatula, TA	FCSturz
EEaston	WReamer, OGC	BSpitzberg, RIV		NRC Attendees

OFC	SFPO	E	SFPO	E	SFPO	C		
NAME	MSDelligatti:dd		VThampe		EJLeeds			
DATE	11/17/97		11/18/97		11/18/97			

C = COVER E = COVER & ENCLOSURE N = NO COPY
OFFICIAL RECORD COPY G:\HOLTEC\HOLTNOV.MIN

11/19/97:dd

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ATTENDANCE LIST
NRC/HOLTEC INTERNATIONAL MEETING
NOVEMBER 6, 1997

NAME	ORGANIZATION	PHONE NUMBER
Mark Delligatti	NRC/NMSS/SFPO	301-415-8518
Marissa Bailey	NRC/NMSS/SFPO	301-415-8531
K. C. Leu	NRC/NMSS/SFPO	301-415-8543
Sheena Whaley	NRC/NMSS/SFPO	301-415-1911
Mary Jane Ross-Lee	NRC/NMSS/SFPO	301-415-3781
Fritz Sturz	NRC/NMSS/SFPO	301-415-8530
David Tang	NRC/NMSS/SFPO	301-415-8535
Steve McDuffie	NRC/NMSS/SFPO	301-415-1085
Eric J. Leeds	NRC/NMSS/SFPO	301-415-8540
Henry Lee	NRC/NMSS/SFPO	301-415-8533
Mysore Natraja	NRC/NMSS/DWM	301-415-6695
Steve Bloom	NRC/NRR/DRPW/PD4-2	301-415-1313
Richard Dudley	NRC/NRR/DRPM/PDND	301-926-4321
Herman Graves	NRC/RES	301-415-5880
John L. Russell	CNWRA	301-881-0289
Kris Singh	HOLTEC	609-797-0900
Gary Tjersland	HOLTEC	609-797-0900
Max DeLong	Northern States Power/PFS	612-330-5850
John Donnell	Private Fuel Storage	303-741-7009
Mark G. Smith	PG&E	415-973-9783
David Ovadia	PG&E	415-973-9829
Jim Doman	Booz-Allen	202-484-8356
Steve Schulin	The IBEX Group	301-762-6714
Sidney Crawford	Self	301-515-6398

ATTACHMENT 1

PG&E AT A GLANCE

FACTS

PG&E CUSTOMERS

GAS

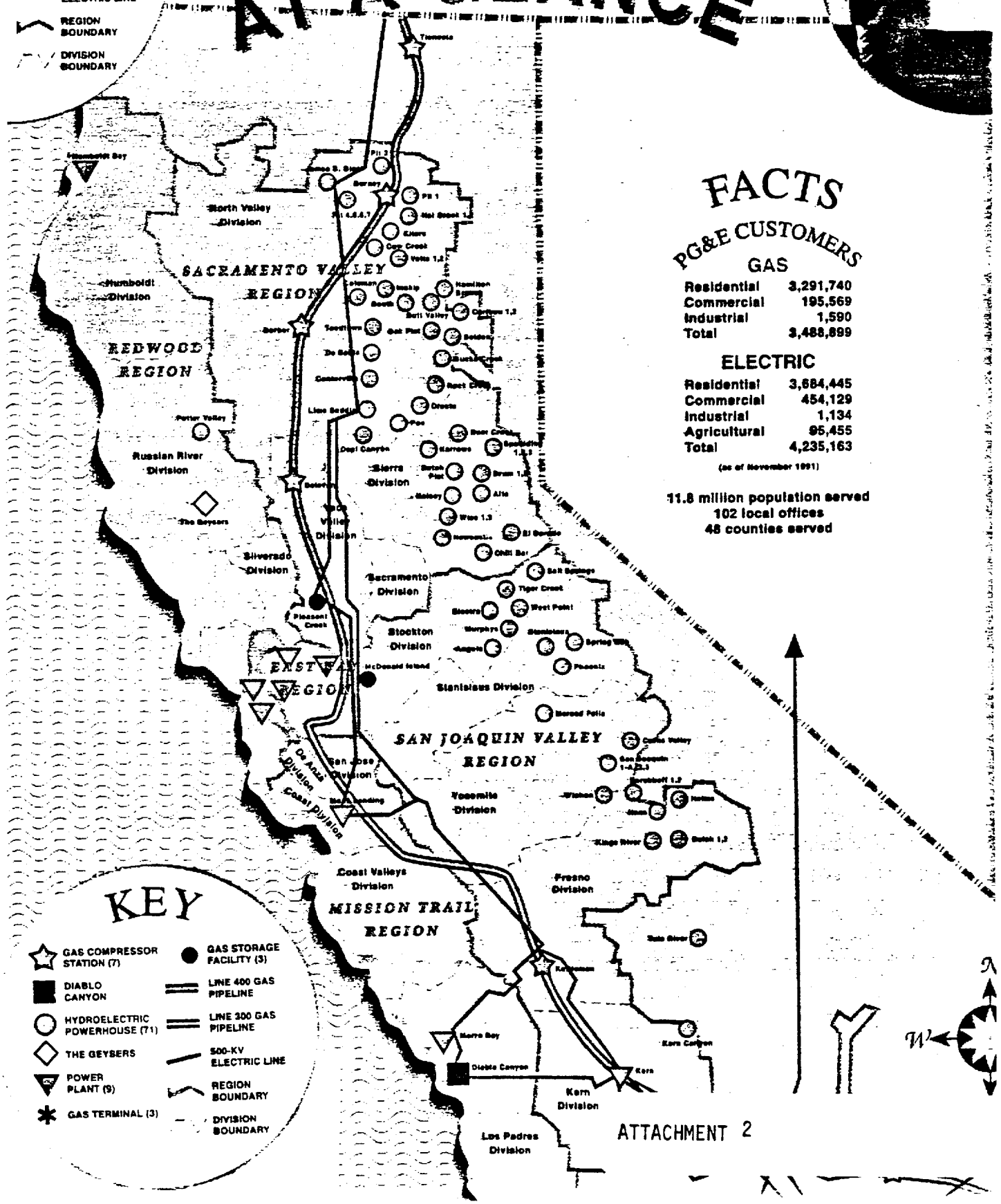
Residential	3,291,740
Commercial	195,569
Industrial	1,590
Total	3,488,899

ELECTRIC

Residential	3,684,445
Commercial	454,129
Industrial	1,134
Agricultural	95,455
Total	4,235,163

(as of November 1991)

11.8 million population served
102 local offices
48 counties served



ATTACHMENT 2

Background

- Pacific Gas & Electric Co. (PG&E) Service Territory
- Diablo Canyon Power Plant (DCPP) and Humboldt Bay Power Plant (HBPP)
- High Seismic Area

Diablo Canyon

- Extensive Geotechnical Evaluation for Licensing Efforts
- Long Term Seismic Program (LTSP) Advanced the Technology in the Geotechnical Areas
- PG&E is Committed to the Management of Seismic Issues

Humboldt Bay

- Plant in Safestor Condition Since 1976
- Public Interest in Dry Cask Storage
- NRC Interest in Resolving Public Concern

Project Schedule Issues

- DCPP Spent Fuel Pool Will Fill by 2005
- NRC Approval Process
- California Coastal Commission Approval
- Public Review Process
- Training and Preparation of Plant Staff Prior to First Use

PRESENTATION TO

THE USNRC

ON THE

PROPOSED TOPICAL REPORT

FOR

HI-STAR/HI-STORM SYSTEMS AT

HIGH SEISMIC ACTIVITY SITES

by

K.P. Singh, Ph.D.

November 6, 1997

ATTACHMENT 3

NEED FOR ISFSIs IN HIGH SEISMIC ZONES

- ALL POTENTIAL LARGE CASK FARM SITES ARE LOCATED WEST OF THE MISSISSIPPI (e.g., SKULL VALLEY FOR THE PFS, LLC AND THE NEVADA TEST SITE FOR POTENTIAL DOE CENTRALIZED INTERIM STORAGE FACILITY)

- COUNTRIES WITH HIGH SEISMIC LEVELS (JAPAN, TAIWAN, KOREA) AWAIT U.S. LEADERSHIP ON THIS ISSUE.

- LOCAL COMMUNITIES WILL ACCEPT "TEMPORARY" ISFSIs AT REACTOR SITES ONLY IF A COMPREHENSIVE REVIEW OF THE DESIGN CONCEPT UNDER A TOPICAL SUBMITTAL HAS OCCURRED.

- NUCLEAR PLANT SITES HAVE BEEN GIVEN EARTHQUAKE "BUMPS" IN THE PAST WHICH MAY CHANGE THE SITUATION AT A SITE FROM ACCEPTABLE TO UNACCEPTABLE.

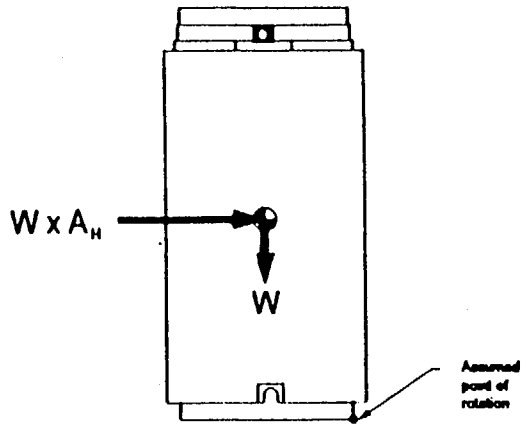
ISFSIs IN HIGH SEISMIC ZONES

- SEISMIC ACCEPTANCE CRITERIA
  - DEMONSTRATE THAT THE CASK WILL NOT OVERTURN DURING THE DESIGN BASIS SEISMIC EVENT.
  - STRESSES IN THE PRESSURE BOUNDARY DURING THE SEISMIC EVENT MEET THE ASME CODE.
  - ISFSI REINFORCED CONCRETE COMPLIES WITH ACI-349

APPROACHES FOR SEISMIC QUALIFICATION

- STATIC FORCE BALANCE
- DYNAMIC TIME-HISTORY ASSESSMENT

LIMITATIONS OF STATIC ANALYSIS



- ASSUMES THAT THE CASK WILL HINGE AT THE FAR POINT OF ROTATION (NO BASIS; PARTICULARLY WHEN THE ISFSI PAD IS WET)
- APPLIES THE ZERO PERIOD ACCELERATION (ZPA) IN ONE DIRECTION (EARTHQUAKES ARE THREE-DIMENSIONAL INPUTS)
- ASSUMES THAT FUEL AND MPC ARE "WELDED" TO THE CASK (IN REALITY, THEY WILL RATTLE INSIDE THE CASK DURING THE EARTHQUAKE)

CHARACTERISTICS OF SEISMIC EVENTS AND NEED FOR DYNAMIC EVALUATION:

- EARTHQUAKES ARE 3-D DYNAMIC EVENTS - TIME-HISTORIES CAN BE CHARACTERIZED BY RESPONSE SPECTRA
  - ZERO PERIOD ACCELERATION (ZPA)
  - ACCELERATION RESPONSE OVER ENTIRE FREQUENCY RANGE
- STABILITY CHECK, BASED ONLY ON ZPA AND STATIC CALCULATIONS, MAY BE FUNDAMENTALLY DEFICIENT

HI-STAR STATIC G-LOAD TABLE

ACCEPTABLE 3-D SEISMIC ACCELERATION SET FOR HI-STAR:

a_x (hor.)	a_y (hor.)	ε ($a_z = \varepsilon a_x$)
0.224	0.224	1
0.237	0.237	0.75
0.252	0.252	0.5

Maximum allowable horizontal acceleration is between 0.32 to 0.36 g's.

Actual earthquakes at western sites are much stronger.

SEISMIC ANALYSIS

- HI-STAR IS A FREE-STANDING SYSTEM WITH COMPONENTS CONTACTING EACH OTHER AND THE ISFSI.
- A 3-D, NONLINEAR, TIME-HISTORY SIMULATION MODELING IS THE APPROPRIATE METHOD TO OBTAIN THE CORRECT SYSTEM RESPONSE

CONTENT OF TOPICAL REPORT

- BACKGROUND AND PURPOSE
- PRINCIPAL DESIGN CRITERIA FOR THE CASK AND ISFSI
  - BOUNDING EARTHQUAKE DEFINITION
  - ACCEPTANCE CRITERIA
- PERTINENT HI-STORM AND HI-STAR GEOMETRY AND INERTIA DATA
- REFERENCE ISFSI PAD DESIGN

CONTENT OF TOPICAL REPORT (continued)

- ANALYSIS METHODOLOGY
- NUMERICAL RESULTS FOR CASK AND ISFSI QUALIFICATION
- STRUCTURAL ADEQUACY OF CASK STABILIZATION SYSTEM
- NUMERICAL CONVERGENCE AND SENSITIVITY STUDIES
- VALIDATION OF CASK RESPONSE BY ALTERNATE MEANS

CONTENT OF TOPICAL REPORT (continued)

- SPECIFICATION FOR ACCEPTABLE DESIGN
  - RANGE OF APPLICABILITY
  - ACCEPTABLE MATERIAL OF CONSTRUCTION
  - APPLICABLE CODES
  - OTHER REQUIREMENTS
- EXAMPLE (CASE STUDIES)

HIGH SEISMIC DESIGN TOPICAL REPORT SCHEDULE

■ SUBMIT REPORT OUTLINE:	MARCH 1, 1998
■ RECEIVE NRC COMMENTS:	APRIL 15, 1998
■ SUBMIT TOPICAL REPORT:	AUGUST 1, 1998
■ FIRST ROUND RAI:	DECEMBER 1, 1998
■ HOLTEC RESPONSE TO FIRST ROUND RAI:	FEBRUARY 1, 1999
■ ROUND 2 RAI:	APRIL 1, 1999
■ RESPONSE TO ROUND 2 RAI:	AUGUST 1, 1999
■ SER ISSUANCE:	DECEMBER, 1999