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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

November 19, 1997

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

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ATTENDANCE LIST NRC/HOLTEC INTERNATIONAL MEETING NOVEMBER 6, 1997

NAME

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ORGANIZATION

PHONE NUMBER

Mark Delligatti	NRC/NMSS/SFPO	301-415-8518
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John Donnell	Private Fuel Storage	303-741-7009
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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



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

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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



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.)	$\varepsilon (a_z = \varepsilon a_x)$
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



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)



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