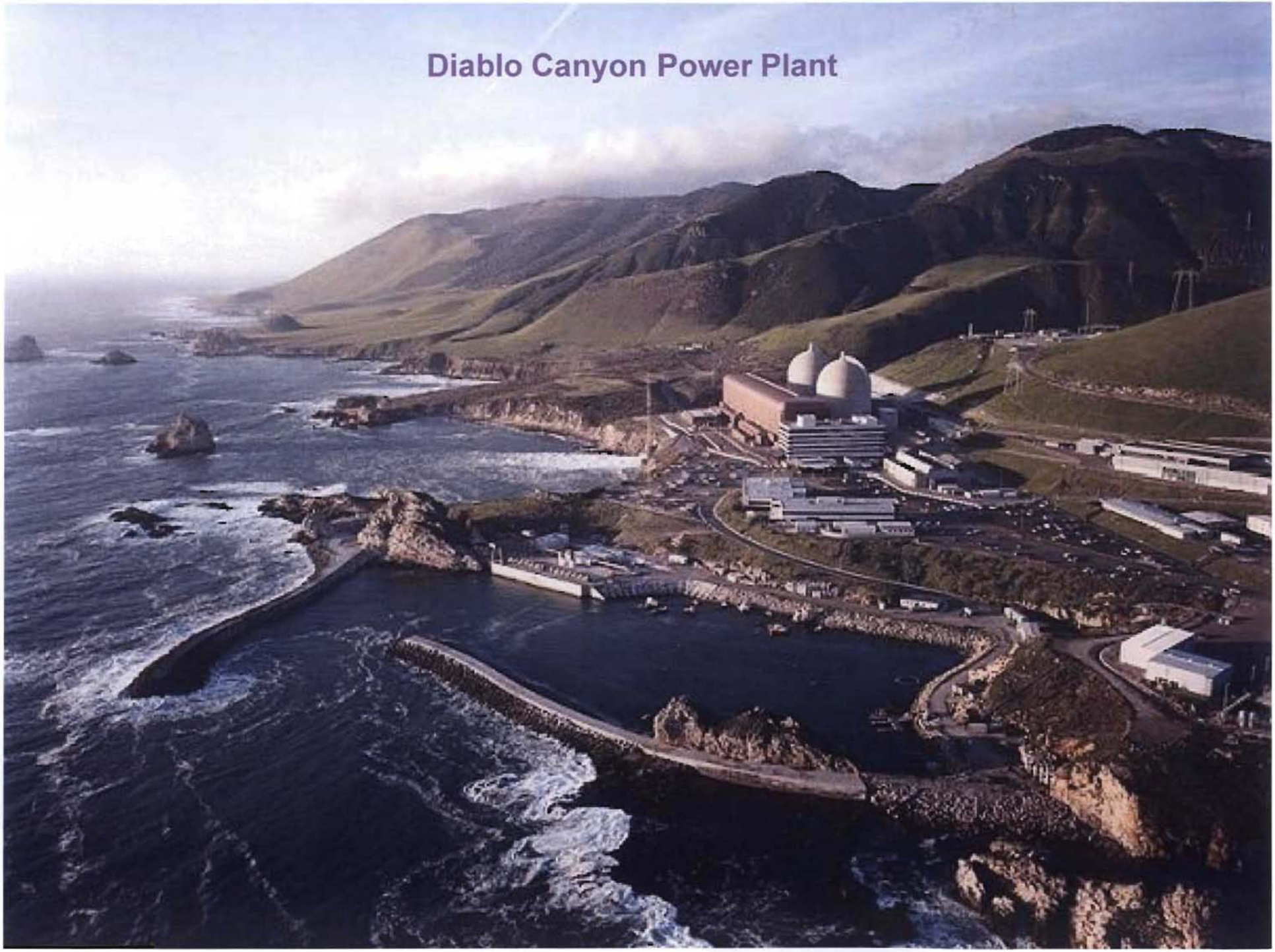
Seismic Pre-Licensing Submittal Meeting

Seismic Geotechnical Insights
December 9, 2010
Washington DC

Diablo Canyon Seismic Review History
Long Term Seismic Program (LTSP)

Pacific Gas and Electric Company

Diablo Canyon Power Plant



Agenda

- DCPP Historical Seismic Summary
- DCPP Seismic Program- LTSP
- LTSP demonstrates adequate DCPP seismic margin (1992 NRC letter)
- Eastern and Central nuclear plants new seismic (Generic Issue 199)
- NRC concluded GI 199 operating nuclear plants are safe to operate
- Continuation of DCPP LTSP commitment to review earthquake information
- DCPP LTSP process continues to confirm seismic margin is maintained
- Meeting is to discuss licensee submittal clarifying prior DCPP commitment to NRC on implementation of LTSP process at DCPP
- Schedule for licensee submittal to NRC

(1983–1985) DCPP Full Power License Issuance

- April 1984: ACRS recommends comprehensive seismic safety reevaluation update within about 10 years
- November 11, 1984: Unit 1 Full Power OL issued with seismic safety condition required, Long Term Seismic Program (LTSP)
- March 1985: ACRS approves LTSP Plan
- August 1985: Unit 2 Full Power OL Issued with seismic safety condition required - LTSP

Long Term Seismic Program (LTSP) with 4 Elements

1. Identify, examine, and evaluate all relevant geologic and seismic data, and interpretations developed since the 1979 ASLB hearings; gather additional relevant data where appropriate
2. Reevaluate the magnitude of the earthquake used for the DCPP seismic design basis
3. Reevaluate ground motions at DCPP
4. Assess the significance of conclusions drawn from the above seismic reevaluation studies, utilizing both probabilistic and deterministic risk analyses, as necessary, to assure adequacy of seismic margins

LTSP

- LTSP Reevaluation Program extended over almost seven years,
  -With numerous technical review groups advising the NRC, including the US Geological Survey, Academic Advisors, and the National Laboratories.
  -Sixty four public meetings held.

- June 1991 NRC SSER 34 states: "that the seismic qualification basis for Diablo Canyon will continue to be the original design basis plus the Hosgri evaluation basis, along with the associated analytical methods, initial conditions, etc. The LTSP has served as a useful check on the adequacy of the seismic margins and has generally confirmed that the margins are acceptable. "

- April 1992 NRC letter concurs with PG&E conclusion that structures and equipment that are affected by the updated ground motions have adequate seismic margins, and that the overall plant margin is not significantly affected.

DCPP Licensing Basis Commitments

- July 16, 1991 letter to NRC states PG&E commitment for certain plant additions and modifications to be checked against LTSP insights and knowledge to verify plant margins remain acceptable

- June 1991 NRC SSER 34 states, "PG&E made the following commitments at the public meeting on March 15, 1991, and in a letter from PG&E to the NRC (Shiffer, 1991f): (1) to continue to maintain a strong geosciences and engineering staff to keep abreast of new geological, seismic, and seismic engineering information and evaluate it with respect to its significance to Diablo Canyon, and (2) to continue to operate a strong-motion accelerometer array and the coastal seismic network, although likely with fewer stations than are currently operating."

Generic Issue 199

- NRC Information Notice 2010-18 issued September 2010
  - To all holders of an operating license for a nuclear power plant
  - Updated probabilistic seismic hazard estimates for Central and Eastern US plants

- NRC staff evaluation in two stage assessment
  - Evaluated change in higher seismic hazard estimates with regard to previous seismic estimates
  - Estimated change in seismic core damage frequency

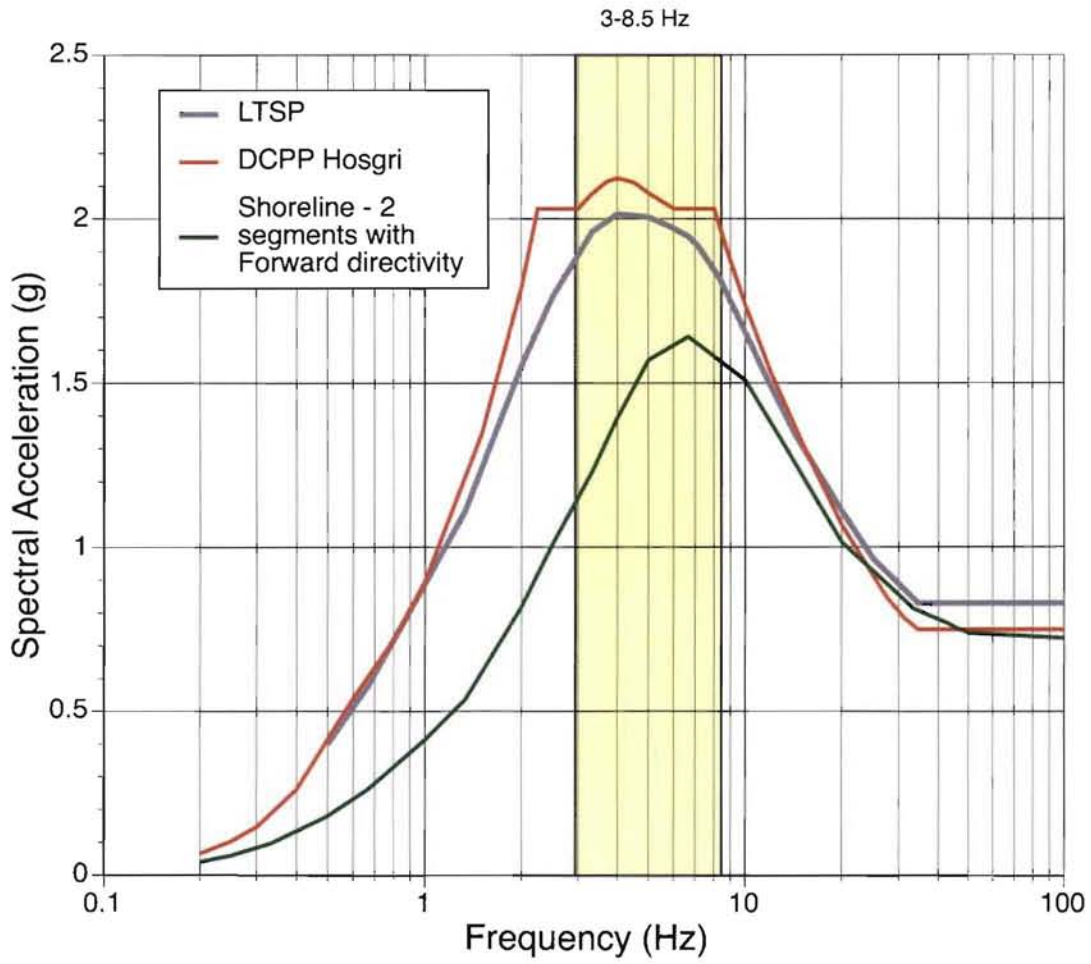
- Concluded operating nuclear power plants are safe and a revision to the design basis earthquakes has not been required

Shoreline Fault

- November 14, 2008, PG&E notified NRC from preliminary LTSP update results of potential Shoreline Fault existence
- November 21, 2008, PG&E provided initial deterministic evaluation that showed the potential Shoreline Fault was bounded by LTSP ground motion levels
- April 2009 NRC letter concluded preliminary independent assessment of DCPP structures, systems, and components are not expected to be adversely affected and current DCPP licensing basis remains valid
- Sep 8-9, 2010, initial probabilistic analysis showed effect of Shoreline fault on probabilistic hazard and updated estimates of seismic risk at DCPP were lower than LTSP estimates (to be finalized Dec 2010)

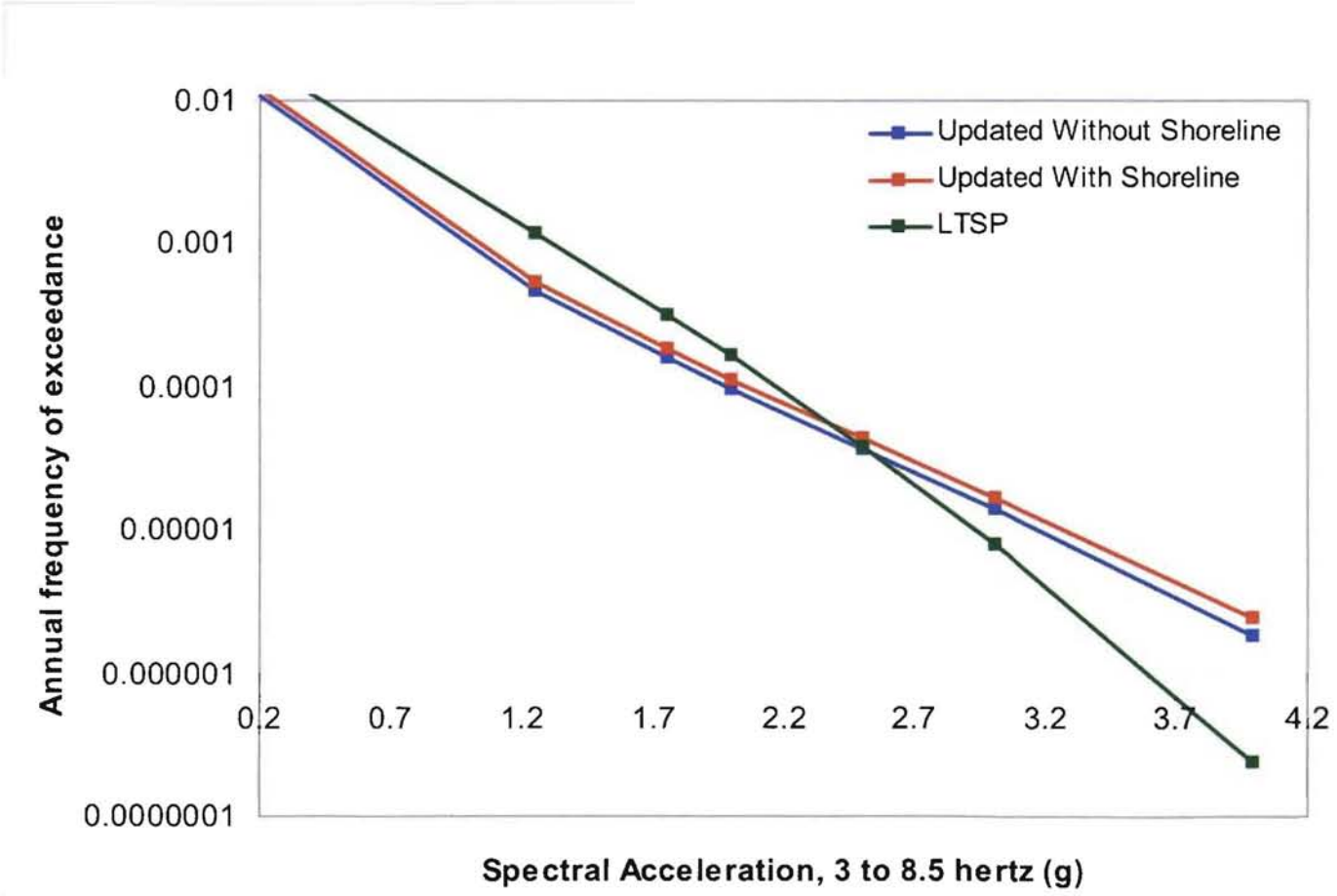
Preliminary Updated Deterministic Hazard

Shoreline vs LTSP and Hosgri



Note: LTSP exceedance of Hosgri @ > 15 Hz, "not significant" per Section 3.8.1.1 of SSER 34

Preliminary Updated Probabilistic Hazard



Preliminary Updated Seismic Risk

Shoreline fault seismic probabilistic updates lead to slightly reduced risk estimate:

- LTSP Models: Seismic Risk = 3.8 E-5
- Using Updated Hazard: Seismic Risk = 3.5 E-5

Proposed LAR Changes

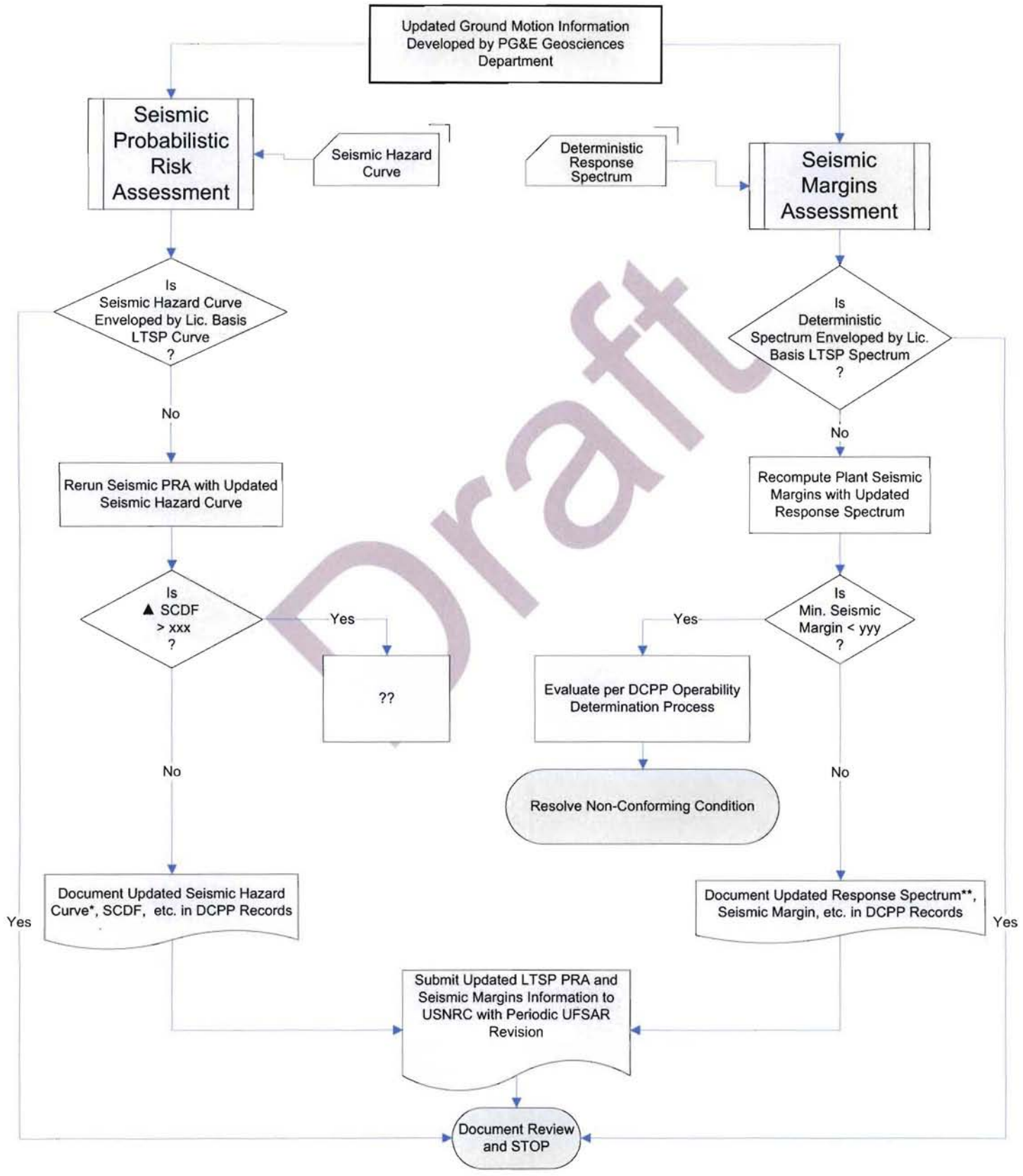
DCPP FSAR Update:

- SSER 34 information to be included for LTSP
- LTSP docketed correspondence to be included
- DCPP LTSP commitment to be included
- SSER 34 requested future plant modification review process to be included
- Process for evaluation of updated earthquake information utilizing LTSP methodology
  - Evaluation performed using current peer reviewed methods

Path Forward

- Discuss DCPP recommendation

DCPP LTSP Update
Evaluation of Updated Ground Motion



* License Basis LTSP Seismic Hazard Curve is replaced with Updated Curve
** License Basis LTSP Response Spectrum is replaced with Updated Spectrum

Submittal Schedule

- DCPP plans to meet commitment to NRC to submit final Shoreline report before 12/31/10
- DCPP intends to submit a license amendment request shortly after Shoreline report submittal
- Final Shoreline report will be reviewed per DCPP LTSP process identified in the license amendment request submittal

Summary

- DCPP continues to assess new earthquake information and evaluate it relative to DCPP LTSP commitment
- DCPP Seismic margin continues to be confirmed via LTSP commitment
- LTSP evaluation process used for DCPP is similar to GI-199 NRC seismic hazard evaluation process
- Final Shoreline report to be submitted prior to 12/31/10
- LAR planned to integrate and clarify LTSP evaluation process