

Decision 10-08-003 August 12, 2010

**BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA**

Application of Pacific Gas and Electric Company  
for Approval of Ratepayer Funding to Perform  
Additional Seismic Studies Recommended by the  
California Energy Commission. (U39E.)

Application 10-01-014  
(Filed January 15, 2010)

**DECISION GRANTING THE APPLICATION**

**1. Summary**

Pacific Gas and Electric Company (PG&E) requests approval of funding to perform additional seismic studies in the area at and around the Diablo Canyon Power Plant recommended by the California Energy Commission (CEC) in the CEC's November 2008 report titled, "An Assessment of California's Nuclear Power Plants: AB 1632 Report" (AB 1632 Report). Specifically, PG&E requests the Commission (1) find that PG&E should proceed with the CEC-recommended additional seismic studies, and (2) authorize PG&E to establish a new balancing account to record and recover in rates the actual costs of those seismic studies, estimated at approximately \$16.73 million. We grant the application.

**2. The California Energy Commission's (CEC)  
Assembly Bill (AB) 1632 Report**

In 2006, the California legislature enacted AB 1632 (Blakeslee, Chapter 722, Statutes of 2006), which was codified as Public Resources Code Section 25303. AB 1632 directed the CEC to: assess the potential vulnerability of California's largest baseload power plants, Diablo Canyon Power Plant (DCPP or Diablo Canyon) and San Onofre Nuclear Generating Station, to a major disruption due

to a major seismic event or plant aging; assess the impacts of such a major disruption on system reliability, public safety, and the economy; assess the costs and impacts from nuclear waste accumulating at these plants; evaluate other major issues related to the future role of these plants in the state's energy portfolio; and include the assessment in the CEC's "2008 Integrated Energy Policy Report Update" (2008 IEPR Update). In response to AB 1632, as part of its 2008 IEPR Update released in November 2008, the CEC issued the AB 1632 Report.

In PG&E's 2007 general rate case decision, the Commission directed PG&E to address and incorporate the recommendations from the AB 1632 Report into its Diablo Canyon license renewal feasibility study. (Decision 07-03-044, Conclusion of Law No. 11.) PG&E has filed Application (A.) 10-01-022 addressing the Diablo Canyon license renewal feasibility study and the AB 1632 Report recommendations related to license renewal. PG&E has filed this application to address the CEC's recommendation that PG&E perform additional seismic studies using a specific technology because the estimated \$16.73 million cost of these additional seismic studies was not included in the cost estimates presented in the 2007 or 2011 general rate cases.

PG&E has an existing, ongoing commitment in connection with the operating licenses for Diablo Canyon issued by the Nuclear Regulatory Commission (NRC) to fund and implement a Long Term Seismic Program (LTSP). The purpose of the LTSP is to continuously study and update the state of knowledge regarding the seismic hazards affecting DCPP. The LTSP ensures that seismic hazards are continuously assessed by PG&E and the NRC and thus ensures the safe operation of Diablo Canyon. PG&E calls upon expertise, both internally and in the industry, to perform the data collection and analyses for the

LTSP. PG&E is currently working on an update to the LTSP and has included the costs associated with this effort (to be incurred after January 1, 2011) in its 2011 general rate case application (A.09-12-020). In its AB 1632 Report, the CEC acknowledged the studies PG&E plans to undertake pursuant to the LTSP, but recommended that PG&E undertake additional seismic studies. More specifically, the CEC recommended that PG&E use three-dimensional (3-D) seismic reflection mapping and other advanced geophysical techniques to explore fault zones near DCP. The results will be integrated with PG&E's LTSP Update and will help further characterize the seismic hazard at Diablo Canyon. For example, the additional studies will examine the location and geometry (segmentation, length, width, and down dip) of fault zones near DCP and their rates of motion. PG&E estimates the total cost to implement these studies and investigations at \$16.73 million over a three-year period from 2011 to 2013.

### **3. PG&E'S Planned Seismic Studies**

#### **3.1. Seismic Survey Design**

As discussed in sections 3.2. and 3.3. below, PG&E proposes to undertake detailed on-shore the two-dimensional (2-D) and off-shore 3-D seismic surveys of the area surrounding DCP. PG&E states that there are challenges to performing effective seismic surveys and it is therefore essential to carefully identify the areas to survey and to plan how the survey will be conducted. For example, there are areas where quality results may not be possible due to the presence of tightly folded and steeply dipping basement rocks that would not be well imaged by either 2-D or 3-D seismic survey techniques. In addition, the area around the "Shoreline fault zone" recently identified by the US Geological

Survey (USGS) is located in shallow water and is not accessible by large vessels used for marine surveys due to dense marine vegetation and submerged rocks.<sup>1</sup> Characterization of the “Shoreline fault zone” and areas that would not be well imaged due to the geology will therefore rely on other geophysical work (e.g., multi-beam echo sounding, magnetic and gravity surveys) and seismicity work (i.e., locating earthquakes) conducted as part of the LTSP Update.

The seismic line locations for the on-shore 2-D survey will have to take into account road access, land ownership, and environmental issues. Both the 2-D and 3-D surveys will be based on geologic models developed during the PG&E LTSP Update along with available on-shore and off-shore industry data. These data will be used to determine how best to image the features of interest and design the seismic data collection (e.g., geometry of seismic sources and receivers, the number and spacing of survey lines, etc.). Areas that have complex geology and dipping strata and or faults may require multiple or larger survey areas than those areas with flat layers and simple geometries.

The seismic survey design cost estimate is \$500,000. This includes the cost to purchase necessary industry seismic line information, reprocess the industry

---

<sup>1</sup> In 2008, ongoing PG&E and the USGS studies indicated the possibility of a minor offshore fault. PG&E's response was to evaluate possible safety implications by studying this potential fault in terms of existing seismic analysis. The data shows that the fault is bounded by existing seismic analysis; PG&E believes that the result of any potential ground motions would be minor and have little, if any, impact on the plant. In 2009, the NRC conducted its own independent evaluation and concluded that potential seismic activity from the Shoreline Fault would be within the plant's existing station designs and does not represent a new challenge to plant operations. The Shoreline Fault will continue to be studied by PG&E, the USGS as well as the NRC as part of PG&E's LTSP activities.

data, design the 2-D and 3-D surveys, and evaluate permit requirements and property access agreements.

### **3.2. Off-shore 3-D Seismic Surveys**

Seismic imaging is a tool used by geologists and geophysicists to image subsurface geologic formations. Sound waves produced by pneumatic devices called “air guns,” or by other means, bounce off underground rock layers and are detected and recorded by ultra-sensitive instruments at the surface. The timing and intensity of these reflections are used to map the location of subsurface structures such as folds and faults. Sophisticated 3-D seismic surveys are based on a grid of closely spaced survey lines that create a high-definition three-dimensional picture of the subsurface geology. Interpretation of these data provides useful information that can help discern new geologic features and constrain uncertainties associated with known fault zones, including geometry (i.e., fault length, width, and dip), location, and fault activity or slip rate. The effectiveness of the 3-D survey is largely dependent on how well the subsurface geology can be imaged.

PG&E proposes to conduct an off-shore 3-D seismic survey. The scope of this task will require acquisition of necessary State of California permits for seismic sources that exceed the 2-kilojoule energy limit, preparing an environmental impact report, renting a ship and crew, and conducting data collection over the defined off-shore survey area as well as data interpretation and integration. The LTSP Update has focused on using high resolution bathymetry, magnetic and gravity data, and existing 2-D seismic reflection lines to determine off-shore fault geometries, locations, and slip rates. The results of the 3-D seismic survey will be integrated with these LTSP Update results.

The cost estimate for the off-shore surveys is \$11 million. This includes \$1 million for deployment (obtain permits, secure survey ship and crew, relocate the survey ship to the survey area) and \$10 million to perform the actual survey, which involves data collection, processing and interpretation (e.g., integrating results with other geological and geophysical data in a geologic information system platform) to characterize the earthquake fault zones. Costs are largely dependent on the size of the survey area that will be defined in the survey design phase. For this estimate, PG&E assumed a survey area of 400 square kilometers which roughly covers the area between Point Buchon and Point San Luis, and out beyond the Hosgri fault zone.

PG&E's ability to proceed with the off-shore studies is conditioned upon obtaining all required permits for the project, including permits from the State Lands Commission and the California Coastal Commission. The permitting process has the potential to delay the anticipated schedule for completion and increase the costs of performing the seismic surveys and studies. As discussed in section IV below, PG&E requests authority to recover its actual costs of conducting the surveys, including any increase in costs associated with the permitting process, including the costs of delay. In addition, it is possible that permits necessary to implement the additional seismic surveys and studies may not be granted at all. In such an event, PG&E would refund to customers any unspent funds collected in rates. The LTSP would continue in effect and fully satisfy NRC regulatory requirements and ensure Diablo Canyon's safe operation.

### **3.3. On-shore 2-D Seismic Surveys**

As with the 3-D seismic imaging techniques, 2-D seismic survey is performed by bouncing sound waves off underground rock layers to reveal geologic structures. Unlike the dense spacing of 3-D surveys, 2-D surveys are

recorded along a single line to create a 2-D image or cross section, similar to an X-ray. By combining several 2-D images on parallel lines, a quasi 3-D image can be created. The sound waves or sources for the on-shore 2-D surveys are created by using either small explosive charges in shallow “shot holes” or by large vehicles equipped with heavy plates that vibrate the ground. 2-D surveys are preferred over 3-D surveys on-shore due to the increased difficulty and cost of deploying instruments in rugged terrain as well as land ownership and environmental issues. The scope of the LTSP Update did not include performing new 2-D seismic surveys. It included detailed (surface) mapping of the geomorphic, marine, and fluvial surfaces, and utilizing and interpreting existing reflection lines to provide evidence of fault geometry and slip rate.

PG&E proposes to conduct a series of on-shore 2-D seismic surveys to image relevant geologic features in the area such as the Los Osos fault zone. As with the 3-D seismic survey, the on-shore surveys will require permitting for siting of shot points and seismic instrument deployment and PG&E’s ability to proceed with the 2-D survey is conditioned upon receiving all necessary approvals.

The cost estimate for the on-shore 2-D seismic surveys is \$2.03 million. This includes \$380,000 to deploy (obtain permits, set up survey lines, shot points, and observation locations) and \$1,645,000 to perform the actual survey, which includes data collection, processing, and interpretation. These costs are based on establishing up to four survey lines on-shore with reasonable efforts to obtain land rights and necessary permits.

### **3.4. Ocean Bottom Seismometer (OBS) Installation**

In addition to the seismic surveys, another advanced technique to explore fault zones near DCP is to install OBS units that will more accurately locate

offshore earthquakes (in conjunction with the existing on-shore seismometers). By combining earthquake locations with surface and subsurface geologic features, obtained through other geological and geophysical data collection techniques such as the 3-D seismic surveys, PG&E will be able to more accurately image fault zones. This knowledge is useful to DCPD as calculated earthquake ground motions at the plant site that are used for assessing structures, systems, and components are largely dependent on the distance of an earthquake fault to the plant site facilities.

Currently, the only seismometers at DCPD are on-shore, installed east of the fault zones of interest. PG&E proposes to purchase and install up to four OBS units off-shore, on the west side of the known fault zones, to provide the critical seismological station coverage necessary to improve the quality of present earthquake monitoring locations. The earthquake location uncertainties will be reduced by having seismometers on both sides of the earthquake fault zones.

The total cost for purchasing and installing four OBS units is \$2.05 million. This includes \$1.51 million to manufacture and deliver the instrument packages and to obtain necessary permits for installation; and \$330,000 to install the OBS units off-shore (determining best locations, having divers install at the predetermined locations, and providing maintenance over a three-year period). PG&E will process data for all earthquakes during the three-year period after OBS installation. There is a manual process to obtain raw data after an earthquake, integrate the data with on-shore recordings, and determine the earthquake locations. This task is estimated at \$120,000. Modeling and data interpretation is estimated at \$90,000 over the three-year period. The modeling involves determining the fault focal mechanisms (i.e., fault motions such as strike

slip) and improving off-shore velocity models. Data interpretation includes analyzing how the OBS data fit with current fault interpretations.

### **3.5. Project Management**

In addition to the costs specific to the surveys and OBS installation, PG&E estimates \$1.15 million to manage and administer the project. This includes \$500,000 to develop a final report, which will present figures that display the results of the surveys, and which will undergo internal and external review (e.g., NRC, PG&E external advisory board). The report will be integrated with the final LTSP Update report that will be the basis for adopting any appropriate changes to the tectonic model and seismic hazard at DCP. In addition, PG&E estimates \$650,000 in additional labor and facilities resources over the three-year period from 2011 to 2013 to: (1) provide technical guidance and review of outside consultant work, (2) ensure the work follows the established scope of the project, (3) utilize DCP facilities and personnel for support during the 3-D and 2-D seismic surveys and (4) manage costs and schedule. These project management costs are not included in PG&E's 2011 general rate case application (A.09-12-020) as they are specific to implementing the CEC recommendations from the AB 1632 Report.

### **4. Peer Review Panel**

In addition to PG&E's proposal to employ outside consultants and subject its seismic studies to peer review, this Commission will convene its own Independent Peer Review Panel (IPRP). The Commission will invite the CEC, the California Geologic Survey, the California Coastal Commission, and the California Seismic Safety Commission to participate on the panel. Under the auspices of the California Public Utilities Commission (CPUC), the panel will conduct a peer review of the seismic studies including independently reviewing

and commenting on the study plan and completed study findings. Our order in this application will require PG&E to submit its study plans and completed study findings to the IPRP for review prior to implementation. Should a dispute arise it should be resolved informally but if that is not attainable the Commission has authority to halt the associated rate recovery.

## **5. PG&E'S Ratemaking Proposal**

PG&E requests the Commission to authorize PG&E to establish a Diablo Canyon Seismic Study Balancing Account (DCSSBA) to record and recover its actual costs of conducting the seismic studies. PG&E estimates that the expenses associated with the seismic studies will be \$16.73 million. PG&E proposes to commence recovery of costs over a three-year period based upon the \$16.73 million estimate and annually to true-up its generation rates based upon actual costs as recorded in DCSSBA. Costs to be recorded to the DCSSBA included costs for the activities described in Section III, which reflect PG&E's implementation of the CEC AB 1632 Report recommendation that PG&E perform additional seismic studies using 3-D seismic imaging. These costs are not reflected in any other PG&E proceeding, such as the 2011 general rate case. The annual estimates of expense for these addition seismic studies are:

2011	\$2.63 Million
2012	\$11.78 Million
2013	\$2.32 Million

PG&E proposes that the costs recorded to the DCSSBA be recovered in the Utility Generation Balancing Account (UGBA), or its successor, as part of the Annual Electric True-up (AETU) for recovery through CPUC-jurisdictional rates.

PG&E will begin recovery of \$2.63 million, plus an allowance for Uncollectibles and Franchise Fees, in the UGBA starting on January 1, 2011.

PG&E will track the difference between the \$2.63 million and the actual

expenditures in the DCSSBA. In 2012, the amount to be collected in the UGBA will be revised to \$11.78 million, plus the balance in the DCSSBA at the end of 2011, and an allowance for Uncollectibles and Franchise Fees. In 2013, the amount collected in the UGBA will be revised to \$2.32 million, plus the balance in the DCSSBA at the end of 2012 and an allowance for Uncollectibles and Franchise Fees. Any amounts in the DCSSBA at the end of 2013 and subsequent years will be transferred to the UGBA annually as part of the AETU proceeding.

Amounts transferred to UGBA for recovery in rates will be collected in generation rates in the same manner as other generation revenue. New rates to include recovery of these costs will be designed based upon the then-current adopted methods for setting electric rates for generation revenue requirement changes.

Costs incurred by PG&E to comply with directions issued by the IPRP shall be recovered in the DCSSBA. The IPRP may employ consultants and experts. Costs incurred by the IPRP shall be reimbursed by PG&E and recovered in the DCSSBA. Recognizing that the projected \$16.73 million cost is an estimate, we are concerned that cost overruns are possible without prior authorization by the Commission. Therefore we shall cap the costs at \$16.73 million and require PG&E to apply for removal of the cap when it believes the costs will exceed \$16.73 million.

## **6. This Application is Exempt from California Environmental Quality Act (CEQA) Requirements**

CEQA applies to projects that require discretionary approval from a governmental agency, unless exempted by statute or regulation. It is long established that the act of ratemaking by the Commission is exempt from CEQA review. As stated in the California Public Resources Code, the “establishment, modification, structuring, restructuring or approval of rates, tolls, fares, or other

charges by public agencies” is exempt from CEQA.<sup>2</sup> Likewise, funding decisions are not “projects” subject to CEQA.<sup>3</sup>

## **7. Issues**

1. Whether the Commission should find that PG&E should proceed with, and recover the costs in rates of, performing the additional seismic studies recommended by the CEC in its AB 1632 Report.
2. Whether PG&E’s ratemaking proposal for recovery in rates of its actual cost of performing the additional seismic studies, including establishment of a Diablo Canyon Seismic Study Balancing Account, is reasonable.

## **8. Intervenor Compensation**

The Utility Reform Network (TURN) has filed its Notice of Intent to Claim compensation. This proceeding had a prehearing conference (PHC) on April 14, 2010, at which time TURN appeared and said “TURN does not take a position on PG&E’s request.” (PHC 3.) No disputed issue was raised by any party. All parties agreed that the application should be promptly granted. As TURN’s participation in the PHC was negligible, it cannot make a substantive contribution to this decision. Therefore, we reject the Notice of Intent.

## **9. Comments on Proposed Decision (PD)**

The proposed decision of the ALJ in this matter was mailed to the parties in accordance with Section 311 of the Public Utilities Code and comments were allowed under Rule 14.3 of the Commission’s Rules of Practice and Procedure. Comments were filed by PG&E and Southern California Edison Company (SCE), and reply comments were filed by SCE.

---

<sup>2</sup> Public Resources Code Section 21080(b)(8).

<sup>3</sup> See, *Citizens to Enforce CEQA v. City of Rohnert Park* (2005) 131 Cal.App.4<sup>th</sup> 1594, 1601.

PG&E does not object to the role of the IPRP to provide comments and make recommendations regarding PG&E's study plans for the seismic studies prior to implementation of the seismic studies and to review and make recommendations regarding the findings or conclusions drawn from the results of the seismic studies. But to the extent the PD purports to grant the IPRP authority to impose mandatory action on PG&E in connection with the study plans or the findings and/or conclusions of the seismic studies, PG&E disagrees. It asserts that the NRC has exclusive jurisdiction over nuclear safety issues. We agree with PG&E and have made the necessary clarification. PG&E points out that it did not include in its \$16.73 million estimate any costs associated with an IPRP. PG&E requests that the decision make clear that the costs of IPRP review and implementation of any IPRP recommendations will be recovered through the DCSSBA, along with the costs to implement the seismic studies. We agree.

PG&E requests the review time for the IPRP be shortened to 14 calendar days from the 30 days contemplated in the PD. We deny this request. Thirty days is barely adequate to review the material expected to be received by the IPRP; any time less would reduce the efficacy of the review.

SCE filed comments and reply comments which support PG&E's comments and recommend a more detailed procedure should the Commission implement the IPRP. SCE recommends:

**Composition of IPRP** – The IPRP should include at least one member who possesses substantial experience in nuclear plant operations and knowledge of seismic requirements for nuclear power plants, including possessing specific, detailed knowledge of NRC regulations and the demarcation between safety-related and non-safety-related issues for nuclear power plants.

**Workshops** – The Commission should schedule workshops as part of the IPRP process for reviewing the final results of the seismic studies.

**Comments on IPRP Recommendations** – The Commission should provide interested parties an opportunity to submit written comments on recommendations made by the IPRP before the Commission requires PG&E to implement the recommendations. The Commission should make the final decision on the IPRP recommendations and any disputes.

In our opinion, implementing SCE’s recommendations would cause duplication and delay. Duplication because our Rules of Procedures already provide a vehicle to convene workshops and present comments. Delay because scheduled workshops and comments impinge upon PG&E’s ability to proceed promptly. As to the composition of the IPRP, we prefer to leave that to the agencies providing the review.

#### **10. Assignment of Proceeding**

Nancy E. Ryan is the assigned Commissioner and Robert Barnett is the assigned Administrative Law Judge in this proceeding.

#### **Findings of Fact**

1. PG&E should proceed with the additional seismic studies recommended by the CEC in its AB 1632 Report.

2. PG&E is authorized to recover in rates its actual costs associated with the additional seismic studies over the three-year period 2011-2013 as described in the application, up to a cap of \$16.73 million.

3. The annual estimates of expense for these additional seismic studies are:

2011	\$2.63 Million
2012	\$11.78 Million
2013	\$2.32 Million

### **Conclusions of Law**

1. PG&E should proceed with, and recover the costs in rates of performing the additional seismic studies recommended by the CEC in its AB 1632 Report.

2. PG&E's ratemaking proposal for recovery in rates of its actual cost of performing the additional seismic studies, including establishment of a DCSSBA, is reasonable, up to a cap of \$16.73 million.

3. It is reasonable to provide for independent peer review of the study plans and of the findings/results of the seismic studies approved and funded through this decision. Therefore, the Commission will convene its own IPRP to conduct a review and provide written comments on the study plans prior to implementation and to conduct a review and provide written comments on the findings and/or results of the studies.

4. The scope and authority of the IPRP is limited to review and comment on the study plans for the seismic studies approved and funded through this decision prior to implementation of those studies and to review and comment on the findings and/or results of the seismic studies approved and funded through this decision.

### **O R D E R**

**IT IS ORDERED** that:

1. Pacific Gas and Electric Company is authorized to establish a Diablo Canyon Seismic Study Balancing Account to record and recover its actual costs of conducting the seismic studies, including its costs associated with the Independent Peer Review Panel, up to a cap of \$16.73 million.

2. Pacific Gas and Electric Company shall commence recovery of costs over a three-year period based upon the \$16.73 million estimate and annually true-up

its generation rates based upon actual costs as recorded in the Diablo Canyon Seismic Study Balancing Account, up to a cap of \$16.73 million.

3. Costs recorded to the Diablo Canyon Seismic Study Balancing Account include costs for the activities which reflect Pacific Gas and Electric Company's implementation of the California Energy Commission Assembly Bill 1632 Report recommendation that Pacific Gas and Electric Company perform additional seismic studies using off-shore seismic imaging.

4. Costs recorded to the Diablo Canyon Seismic Study Balancing Account shall be recovered in the Utility Generation Balancing Account, or its successor, as part of the Annual Electric True-up for recovery through CPUC-jurisdictional rates.

5. Pacific Gas and Electric Company shall begin recovery of \$2.63 million, plus an allowance for Uncollectibles and Franchise Fees, in the Utility Generation Balancing Account starting on January 1, 2011. Pacific Gas and Electric Company shall track the difference between the \$2.63 million and the actual expenditures in the Diablo Canyon Seismic Study Balancing Account. In 2012, the amount to be collected in the Utility Generation Balancing Account shall be revised to \$11.78 million, plus the balance in the Diablo Canyon Seismic Study Balancing Account at the end of 2011, and an allowance for Uncollectibles and Franchise Fees. In 2013, the amount collected in the Utility Generation Balancing Account shall be revised to \$2.32 million, plus the balance in the Diablo Canyon Seismic Study Balancing Account at the end of 2012 and an allowance for Uncollectibles and Franchise Fees. Any amounts in the Diablo Canyon Seismic Study Balancing Account at the end of 2013 and subsequent years shall be transferred to the Utility Generation Balancing Account annually as part of the Annual Electric True-up proceeding.

6. Pacific Gas and Electric Company shall provide the Independent Peer Review Panel with its seismic study plans prior to implementation of the seismic studies. The Independent Peer Review Panel shall review and provide Pacific Gas and Electric Company written comments on the study plans within 30 days of receipt.

7. Pacific Gas and Electric Company shall provide the Independent Peer Review Panel the findings and/or results associated with the seismic studies upon finalizing those findings and/or results. The Independent Peer Review Panel shall review and provide Pacific Gas and Electric Company written comments on those findings and/or results within 30 days of receipt.

8. Pacific Gas and Electric Company is authorized to file a motion to reopen this Application when it believes the seismic studies costs authorized by this decision will exceed \$16.73 million.

9. Application 10-01-014 is closed.

This order is effective today.

Dated August 12, 2010, at San Francisco, California.

MICHAEL R. PEEVEY  
President  
DIAN M. GRUENEICH  
JOHN A. BOHN  
TIMOTHY ALAN SIMON  
NANCY E. RYAN  
Commissioners