

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Application of Pacific Gas and Electric
Company (U 39 E) for Authority to
Increase Revenue Requirements to Recover
the Costs to Replace Steam Generators in
Units 1 and 2 of the Diablo Canyon Power
Plant

Application 04-01-009
(Filed January 9, 2004)

**OPENING BRIEF OF
THE OFFICE OF RATEPAYER ADVOCATES**

[REDACTED]

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1. INTRODUCTION

Pursuant to Rule 75 of the Commission's Rules of Practice and Procedure, and the procedural schedule established by Administrative Law Judge Jeffrey O'Donnell at the close of evidentiary hearings (9 RT 1217:24-1218:3), the Office of Ratepayer Advocates (ORA) hereby submits this Opening Brief in the application of Pacific Gas and Electric Company (PG&E) for rate recovery of the costs of a project to replace the steam generators at Diablo Canyon Power Plant, Units 1 and 2.

In summary, ORA makes the following recommendations:

- ORA acknowledges the need for steam generator replacement at Diablo Canyon.
- The Commission should consider the relatively low additional risks and costs related to delaying the installation of the replacement steam generators by one year.
- PG&E's modeling overstates the net benefit savings of the steam generator replacement project (SGRP). The Commission should find that PG&E's estimate of \$1.2 billion is unreliable.

- PG&E has already demonstrated that its \$706 million cost estimate for the SGRP is unreasonable. ORA's most critical recommendation to the Commission is that it not adopt this estimate or pre-approve it as a reasonable cost. Furthermore, the Commission should not approve PG&E's request that a reasonableness review of project costs be limited to amounts that exceed \$706 million. The \$706 million figure is untrustworthy guesswork because:
 - the significantly more expensive procurement contract PG&E entered into subsequent to the filing of its Application already proves that PG&E's cost estimates, (following this utility's historic pattern of cost miscalculations for this nuclear site) are unreliable, faulty, and invariably understated.
 - PG&E has admitted that the installation contract it will enter into will not be a fixed-price contract and that the needed contingency amount will be volatile. Despite PG&E's contention that it would be imprudent to have an installation contract contingency of less than ten percent, it has not withdrawn that contention while simultaneously proposing a much lower contingency amount at hearings. This guesswork and doublespeak should not be rewarded.
 - PG&E's estimated owners costs are unreliable and should not be adopted as they have no supporting workpapers and by PG&E's own admission, will be very volatile.
 - PG&E's estimate of AFUDC costs cannot be relied upon because PG&E is proposing an authorized cost of capital percentage in this proceeding that is much higher than the percentage it is requesting in an open cost of capital proceeding currently before this Commission.

- If the Commission approves the SGRP, it should authorize traditional, cost-of-service ratemaking, permitting PG&E to file an Application under P.U. Code Section 463 for a reasonableness review of the actual costs of procurement, installation and owners' costs. The Commission should also phase in the SGRP's capital costs into rate base over three years instead of two to spread out the expected revenue requirement increase.
- CPUC precedent supports ORA's and other intervenors' recommendations to disallow at least \$18 million because of PG&E's conscious failure to pursue potentially successful litigation against Westinghouse for the defective original steam generators. **“[I]t is not acceptable for a regulated utility to look to ratepayers as a deep pocket of first resort when it arguably has an adequate remedy at law against the manufacturer of a defective product.”** D.85-03-087, 17 CPUC 2d at 473.

2. NEED FOR STEAM GENERATOR REPLACEMENT PROJECTS

2.1 Degradation of Original Diablo Canyon Steam Generators

ORA does not oppose the need for steam generator replacement at Diablo Canyon.¹ ORA does however, take the position that PG&E, during the life of the present steam generators, has not done all it could reasonably have done to prevent them from being in their present condition. ORA also believes that PG&E has not met its obligation to minimize the ratepayers' past and future contributions toward paying for the costs associated with Diablo Canyon's steam generators.

Diablo Canyon's steam generators are “operating with many tubes with SCC [stress corrosion cracking] in service (several thousand cracks) under approved NRC

¹ ORA-Ex. 15 at 1, 3-4.

license conditions.”² The NRC has set steam generator tube plugging limits at “15 percent in any steam generator or 15 percent in all.”³ According to PG&E, the worst steam generator in Unit 1 is 8 percent plugged, while the worst in Unit 2 is at 9.3 percent.⁴ PG&E is at the tail end of steam generator replacements that have taken place in the industry: “[m]ost other utilities in the United States with pressurized water reactors that started operation with similar steam generator tubing material already have replaced steam generators or are planning steam generator replacement in the next 10 years.”⁵ Although PG&E has not yet initiated its planned tube sleeving program, which will allow for the return to service of plugged tubes, sleeving will only postpone the inevitable.

Steam Generator Tube Plugging Caused by Early Condenser Leaks

ORA notes that one cause of degradation in the steam generator tubing were early condenser leaks. PG&E-Ex. 1 discusses primary water stress corrosion cracking (PWSCC) at dented tube support plates:

At DCPD, the driving force for this mode of degradation is denting at the tube support plate intersections. *This denting occurred during early cycles of operation as a result of seawater ingress associated with condenser leaks.*

Chlorides introduced by seawater leaks caused corrosion of the carbon steel tube support plates in crevice areas. Corrosion products developed by this process occupied increased volume with respect to the base metal and exerted high pressures on outside tube walls, causing some tube walls to locally deform under high stress (see Figure 2-4). This high residual stress from denting eventually causes SCC. PG&E has taken remedial actions to minimize further denting, including condenser design changes to prevent further leaks and use of on-line boric acid addition, which reduces the potential for denting. Based on DCPD inspection data, no detectable increase in the size or number of dents is now

² PG&E-Ex.1 at 2-10.

³ PG&E- Ex. 1 at 2-9.

⁴ ORA- Ex. 15 at 3.

⁵ PG&E- Ex. 1 at 2-2.

occurring, therefore, new denting is essentially arrested at DCP. However, *several thousand dents already exist that have the potential to develop PWSCC. To date, a total of 250 tubes⁶ have been plugged for PWSCC at tube support plates.*

PG&E-Ex. 1 at 2-19, lns. 12-28 (emphasis added).

PG&E elaborated further in response to an ORA data request:

Despite PG&E's best efforts to avoid it, condenser leaks occurred during the early operating cycles because the titanium condenser tubes installed before startup experienced unexpected vibration and, in some cases, fatigue cracked and causing seawater leaks that exceeded the condensate polishers capacity. Seawater ingress into the steam generators promoted denting at the tube support plates. Each condenser tube leak that caused condensate polisher capacity problems was quickly detected with on-line instrumentation, the plant curtailed, and the problem tube removed from service. In this early time period, denting was a general problem in the nuclear industry. The industry was striving to develop better chemistry control and additives to help prevent denting. These changes were developed in the 1980s and were implemented by PG&E when available. For example, PG&E implemented boric acid addition to the feedwater (one of the industry's most successful denting prevention initiatives) in 1988.

During the first refueling outages PG&E developed a method to stake the condenser tubes with long iron bars to eliminate vibration. *By about 1987-1988, the seawater leakage problems had been solved.* Additionally, the industry had found that boric acid acted as a buffering agent in the feed water and would significantly help arrest the denting process. *PG&E began using boric acid in both Diablo Canyon units' feed water systems in 1988.* With a combination of improved condenser performance and use of the boric acid buffering agent, denting was essentially arrested in the 1988 time frame.

ORA-Ex. 2 (PG&E response to ORA data request 2, Q.4, emphasis added).

⁶ According to PG&E- Ex. 1, Table 2-4, ln. 31 on page 2-13 and Table 2-5, ln. 30 on page 2-14, Unit 1 has had a total of 516 tubes plugged, while Unit 2 has had a total of 769 tubes plugged. Dividing the 250 tubes plugged for PWSCC at tube support plates by the total tubes plugged for both Units, (1285) results in the knowledge that 19 percent of plugged tubes come from PWSCC at tube support plates.

ORA notes that the use of boric acid to prevent denting began in 1988, three years after commercial operation began at Unit 1 and two years after commercial operation began for Unit 2.⁷ The condenser leaks at Diablo Canyon significantly contributed to the degradation of its steam generators, resulting in plugged tubes, a greater need for inspections and culminating in PG&E's request to replace Diablo Canyon's steam generators. Although PG&E was apparently successful in arresting further denting, it appears that the damage was already done and irreversible.

WEXTEx "Improvements"

The role of the so-called WEXTEx "improvements" in steam generator tube degradation must also be considered when determining the cause for the generators' present condition. PG&E's testimony states that Westinghouse used the WEXTEx process to expand the steam generator tubes in the tube sheet.⁸ In May 1975, Westinghouse made PG&E an offer it couldn't refuse:

We have discussed with [PG&E's] technical staff on several occasions a series of mechanical modifications to the Steam Generators which will improve flow distribution through the tube bundle and reduce sludge accumulation above the tubesheet. From the May 22 meeting is our understanding that Pacific Gas and Electric is in agreement that these improvements should be incorporated in the Diablo Canyon Units 1 & 2 Steam Generators. We further understand that it is your desire to proceed with these improvements on an accelerated schedule...*Because of the mutuality of interests in these improvements between Westinghouse and PG&E, we are prepared to supply the required materials and technical direction at no cost to PG&E.* We expect that field labor for the requested changes will be paid by PG&E.

TURN-Ex. 18 at 1, (excerpt from PG&E response to ORA data request 12, Q.16, emphasis added).

⁷ PG&E-Ex. 1 at 2-8, Table 2-2, ln. 10.

⁸ PG&E-Ex. 1 at 2-8, Table 2-2, ln. 3.

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Unfortunately, the WEXTEx “improvements” may have turned into a liability: an August 1989 PG&E internal memo discusses circumferential cracking in explosively expanded tubes:

It is expected that cracking at the transition is a generic problem that will affect all ten US units with Westex [sic] expansion, including Diablo Canyon 1 & 2. Based on T-hot and time in operation, *DCPP Units 1 & 2 should be the last of the ten units to experience this cracking. At this time, there is no preventative remedial measure, and corrective measures are sleeving and plugging with stabilizers.*

ORA-Ex. 3 at PGESL001399 (emphasis added).

A March 1990 PG&E internal memo goes into further detail:

The DCPP steam generators are susceptible to circumferential cracking at the following locations:

1. Tube expansion transition zone at top of tubesheet
- DCPP has WEXTEx explosively expanded tubes, and circumferential cracking has been experienced at 3 plants with

WEXTEX expansions. Based on the observed time to crack at North Anna 1 & 2 and Trojan and the difference in hot leg temperature, *an estimate of the time to crack for DCPD is 8 to 11 effective full power years*. Most of the cracking observed to date in WEXTEX expansions has been circumferential. Westinghouse reported that tests being performed for the WEXTEX owners group were getting underway in February with no significant results to date.

Id. at PGESL001400 (emphasis added).

The reason ORA has brought up the early condenser leaks and WEXTEX “improvements” here is to suggest that while ORA does not oppose the replacement of Diablo Canyon’s degraded steam generators, the Commission should consider PG&E’s history with early condenser leaks and WEXTEX “improvements” separate from the “Westinghouse Issues” discussion in Section 7 below. The early condenser leaks and WEXTEX “improvements” had a significant impact on the degradation of Diablo Canyon’s steam generators.

2.2 Reasonableness of 2008 and 2009 Replacement Dates for Unit 2 and Unit 1

While PG&E requests that Diablo Canyon’s steam generators be replaced in 2008 and 2009, ORA recommends that the Commission consider whether PG&E should defer replacement steam generator installation to 2009-2010.⁹ The rationale for delaying installation is that there would be little additional risk or cost related to delay: according to PG&E, there is a 98 percent chance of reaching 2009-2010¹⁰, and that delaying installation would only cost an additional \$33 million.¹¹ In rebuttal testimony, PG&E tried to raise the possibility of additional labor costs¹², but PG&E has no workpapers to

⁹ ORA-Ex. 15 at 4-6.

¹⁰ PG&E-Ex. 1 at 5-16, Table 5-2.

¹¹ Id. at 5-37, Table 5-14.

¹² PG&E-Ex. 3 at 5-9.

support this argument.¹³ Delaying installation would also permit PG&E and the Commission to determine whether steam generator degradation is occurring in accord with PG&E's forecasts or at a slower or faster rate. If degradation occurs at a slower rate, then PG&E will be able to obtain a little extra use out of the existing steam generators.

Another argument supporting delaying replacement steam generator installation is that PG&E has also proposed to begin inserting sleeves into some degraded tubes, allowing them to be returned to service.¹⁴ Delaying installation of new steam generators will permit PG&E and the Commission to determine the effectiveness of the sleeving program. According to Southern California Edison (SCE), San Onofre Unit 2 began sleeving in January of 1999 and currently has over 400 sleeves installed.¹⁵ PG&E has not installed any sleeves at Diablo Canyon at this point.¹⁶ As early as 1984, one article mentions the industry's use of sleeving: "[s]leeving is becoming an important method of repairing tubes, particularly those which are degraded near or within the tube sheet. It

¹³ ORA-Ex. 6; 5 RT 577-579.

¹⁴ ORA-Ex. 15 at 5, PG&E's response to ORA data request 2, Q.5: "PG&E has submitted a License Amendment Request to the NRC requesting a license for using sleeves. We expect the NRC to issue this License Amendment by Fall 2004 so that we can use these sleeves if needed in the 2R12 (October 2004) outage. The actual time when sleeving will be required depends on the convergence of several things:

If the NRC approves a License Amendment to raise the ODSCC ARC plugging limit from 2 volts to 3 or 4 volts in conjunction with our plans to lock the tube support plates, the need for sleeving will be delayed because more tubes can be left in service without repair;

If degradation rates increase rapidly (pessimistic predictions) and more tubes require repair, we will need to use sleeving earlier; and

If efforts are successful to raise the overall plugging limit above 15% and it is decided that some loss of megawatt output is acceptable, the need for sleeving can be delayed.

The Monte Carlo analysis done to justify the steam generator replacement project (most likely scenario) predicts that sleeving will be needed in 2006 for Unit 2 and 2007 for Unit 1."

¹⁵ ORA-Ex. 15 at 5, Southern California Edison, Steam Generator Replacement Project briefing, June 21, 2004 at 58. An Energy Information Administration article, "Steam Generator Degradation and Its Impact on Continued Operation of Pressurized Water Reactors in the United States," *Electric Power Monthly*, Aug. 1995, shows significant sleeving activity in tables on pages xviii and xx. SONGS Unit 2 began commercial operation in August 1983, while SONGS Unit 3 began commercial operation in April 1984.

¹⁶ ORA-Ex. 15 at 5, PG&E's response to ORA data request 5, Q.19.

allows a degraded tube to be kept in service and therefore is preferable to plugging with the consequent loss of heat transfer area.”¹⁷

3. COST-EFFECTIVENESS OF STEAM GENERATOR REPLACEMENT PROJECTS

3.1 Cost-Effectiveness of the Projects

PG&E’s cost/benefit analysis, performed by Strategic Decisions Group (SDG), concludes that PG&E’s ratepayers should save \$1.2 billion in present value revenue requirements with the replacement projects, as opposed to shutting down Diablo Canyon in 2013/2014.¹⁸ Since ORA’s cost/benefit analysis also results in significant positive net benefits, ORA does not disagree with the results of SDG’s analysis, but it does have several observations:

- PG&E did not include the approximately \$800 million of Diablo Canyon net plant costs in its cost/benefit analysis.¹⁹
- ORA asked PG&E to prepare a base case resource plan, with Diablo Canyon both in-service and out-of-service. PG&E responded by essentially referring ORA to PG&E’s cost/benefit analysis in PG&E-1.²⁰ ORA does not agree that PG&E’s cost/benefit analysis takes the place of a complete integrated resource plan.
- PG&E’s “base case” scenario results in approximately \$550 million in net benefit savings, as opposed to PG&E’s rosy scenario of \$1.2 billion in net benefit savings.²¹ Aglet’s scenario results in only \$850 million in net benefit savings.²²

¹⁷ ORA-Ex. 15 at 5, “Steam Generator Tube Performance: Experience with Water-Cooled Nuclear Power Reactors During 1981,” *Nuclear Safety*, Vol. 25, No. 3, May-June 1984 at 391.

¹⁸ PG&E-Ex. 1 at 5-3.

¹⁹ ORA-Ex. 15 at 16; ORA-Ex. 5.

²⁰ *Id.*

²¹ *Id.* at 17, 5 RT 493.

²² Aglet-Ex. 2 at 24.

- As discussed below in 3.2.1.2, ORA doubts that capital expenditures in the 2016 to 2024 time period will drop to approximately \$35 million annually, given the advancing age of Diablo Canyon and PG&E’s history with significant capital expenditures at the plant.²³
- As discussed below in 3.5, ORA believes that PG&E’s modeling overstates the net benefit savings of the steam generator replacement projects. While 5 percent of PG&E’s modeling runs resulted in net losses, those scenarios are washed out by the majority of runs that result in significant net benefit savings.

3.2 Reasonableness of Cost Effectiveness Modeling Assumptions

As discussed below, ORA is concerned about PG&E’s capital cost, degradation and plugging assumptions and discount rate assumptions.

3.2.1 O&M and Capital Forecasts Used in the PG&E Cost Effectiveness Model

3.2.1.1. O&M

ORA does not oppose the O&M forecasts used in PG&E’s cost/effectiveness model. ORA reserves the right to comment further on this issue in its Reply Brief.

3.2.1.2 Capital Costs

For the purposes of its cost/effectiveness model, “PG&E assumed that all major capital projects necessary to allow Diablo Canyon to reach the end of the expected license life will be completed by 2015. Based on that assumption, PG&E expects that the base level capital expenditure amounts presented in this application will be sufficient to cover on-going capital requirements for the period 2016 through 2024.”²⁴ ORA doubts that capital expenditures in the 2016 to 2024 time frame will drop to approximately \$35 million annually, given the advancing age of Diablo Canyon and PG&E’s history with significant capital expenditures at the plant.

²³ ORA-Ex. 15 at 17.

²⁴ ORA-Ex. 15 at 17, citing a PG&E response to ORA data request 9, Q.9.

Aglet-Ex. 2, pages 23 and 25 show Diablo Canyon's historic capital additions from 1985 through 2003. Capital additions are never less than \$45 million annually from 1985 through 1995, and then they bottom out during the 1997-2001 ICIP²⁵ period, when PG&E had an incentive to reduce capital expenditures to the bare minimum because of AB 1890 and the Commission's electric restructuring policies. PG&E's capital expenditure forecast for 2004 through 2015 shows expenditures that exceed \$50 million annually, with the exception of 2015.²⁶

Although PG&E is very confident it can foresee Diablo Canyon's capital expenditure future, ORA and the intervening parties are not so sanguine. As ORA pointed out during hearings, if PG&E's capital expenditures grow by 2.65 times the current estimate, the net present value savings drop to zero.²⁷ TURN-Ex. 19, Table 1, Scenario 6 shows that a 10 percent capital cost and 2 percent O&M cost increase above PG&E's base line assumptions would reduce net benefits by \$443 million. Considering PG&E's inability to control the procurement and installation direct costs for the steam generator replacement projects, *which are currently 21 and 7 percent over-budget*, respectively, ORA expects additional, significant cost overruns in the future. Another factor that should be considered are "unpleasant surprises," to use the words of TURN's witness, Mr. Schlissel.²⁸ Surprises are by their nature unpredictable, so the Commission should disregard PG&E's certainty about Diablo Canyon's future capital expenditures.

3.2.2 Replacement Energy Prices used in the PG&E Cost Effectiveness Model

3.2.2.1 Replacement Energy Prices

²⁵ CPUC D.97-05-088, 72 CPUC.2d 560. ORA notes that while PG&E told Aglet in this proceeding that the actual 1997 plant additions were \$17.5 million (Aglet-2 at 25), PG&E told the Commission in the ICIP proceeding that "PG&E estimates that the incremental capital additions to Diablo Canyon will be \$37 million in 1997. This estimate is based on 1997 projected capital additions." 72 CPUC.2d 560, 594.

²⁶ PG&E-Ex. 1 at 5A-4, Table 5A-3.

²⁷ 9 RT 1194-1195.

²⁸ TURN-Ex. 20 at 42-43.

ORA does not oppose the replacement energy prices used in PG&E's cost/effectiveness model. ORA reserves the right to comment further on this issue in its Reply Brief.

3.2.2.2. Renewable Power Costs

ORA does not oppose the renewable power costs used in PG&E's cost/effectiveness model. ORA reserves the right to comment further on this issue in its Reply Brief.

3.2.2.3 Energy Efficiency Options

ORA does not oppose the energy efficiency options used in PG&E's cost/effectiveness model. ORA reserves the right to comment further on this issue in its Reply Brief.

3.2.3 Degradation and Plugging Assumptions Used in the PG&E Cost Effectiveness Model

PG&E predicts that "the worst steam generator in Unit 1 will reach the assumed 25 percent plugging limit in 2014 and the worst steam generator in Unit 2 in 2013."²⁹ PG&E-8, the workpapers for the Revised Direct Testimony -- Chapter 2, contains the Dominion Engineering study that is the basis for PG&E's prediction. PG&E-Ex. 1 at pages 5-17 to 5-19 and Figures 5-5 and 5-6 discuss a wide range of outside diameter stress corrosion cracking (ODSCC) degradation scenarios at Diablo Canyon. Table 5-1 on page 5-15 of PG&E-Ex. 1 shows the predicted forced shutdown due to reaching plugging limits for Unit 1 in 2014 (1R18) and Unit 2 in 2013 (2R17).

ORA does not oppose PG&E's degradation and plugging scenarios, but the Commission should consider how wide the variation is between the "low", "base" and "high" degradation scenarios in Figures 5-5 and 5-6. If degradation progresses at the "low" scenario rates, as opposed to the "base case" or "high" degradation scenario rates, replacement of the steam generators could be significantly delayed. Since PG&E has yet to begin sleeving at Diablo Canyon, which will extend the useful life of the existing

²⁹ PG&E-Ex. 1 at 2-30.

steam generators, the Commission should consider whether deferring steam generator replacement is reasonable.

3.2.4 Other PG&E Assumptions In Cost-Effectiveness Model

PG&E's cost/effectiveness model uses an 8.6 percent discount rate to evaluate revenue requirement streams.³⁰ Typically, utilities use their authorized cost of capital as the discount rate. PG&E's current authorized cost of capital is 9.24 percent, although PG&E has asked the Commission to reduce it to 8.49 percent for 2004 and 8.90 percent for 2005.³¹ The difference between using 8.6 percent and 9.24 percent as the discount rate is real, but since the replacement projects will generate significant present value benefits, not critical.

3.3 Reasonableness of TURN Cost-Effectiveness Modeling Method and Assumptions.

OR ORA takes no position on TURN's cost/effectiveness modeling method and assumptions. ORA reserves the right to comment further on this issue in its Reply Brief.

3.4 Reasonableness of ORA's Cost Effectiveness Calculations

Not surprisingly, ORA supports the reasonableness of its cost-effectiveness calculations.³² ORA's analysis concludes that the present value revenue requirement benefit of the steam generator replacement projects is approximately \$1.1 billion. No other party has challenged ORA's cost-effectiveness analysis. ORA's analysis is the only one that includes a revenue requirement treatment for the approximately \$800 million of Diablo Canyon net plant costs in its cost/benefit analysis.³³ ORA also tested its cost-effectiveness analysis for sensitivities, which supported its reasonableness.³⁴

³⁰ 5 RT 579.

³¹ 3 RT 404.

³² ORA-Ex. 15 at 18 and Table ORA-2.

³³ ORA-Ex. 5.

³⁴ 9 RT 1194-1195.

3.5 Sensitivity Studies

“It has been pointed out already that no knowledge of probabilities, less in degree than certainty, helps us to know what conclusions are true, and that there is no direct relation between the truth of a proposition and its probability. Probability begins and ends with probability.”

Semi-famous dead economist, John Maynard Keynes

PG&E’s modeler, SDG, dealt with sensitivity studies by adding a plethora of variables to its model, making over 9600 runs while rolling the dice and finding the mean of the runs, ultimately \$1.2 billion in net benefit savings.³⁵ PG&E admits that 5 percent of the scenarios it ran resulted in net losses.³⁶ On the other side, 10 percent of the runs resulted in benefits exceeding \$2.44 billion, reaching \$5.2 billion in net benefit savings for the “best case” scenario.³⁷ As illustrated in Figure 5-13 on page 5-35 of PG&E-Ex. 1, the large number of runs with positive net benefit savings pushes the mean higher. PG&E admits that its “base case” scenario has net benefit savings of approximately \$550 million, less than half of the mean.³⁸ ORA recommends that the Commission carefully review PG&E’s modeling before drawing any conclusions.

4. REASONABLENESS OF \$706 MILLION COST ESTIMATE FOR THE STEAM GENERATOR REPLACEMENT PROJECTS

PG&E has not demonstrated the reasonableness of its \$706 million cost estimate for the steam generator replacement projects. The Commission only has to decide on the reasonableness of PG&E’s estimate if it decides to pre-approve PG&E’s estimate for ratemaking purposes. The Commission should not pre-approve PG&E’s estimate, and should continue to hold the threat of a disallowance of unreasonable costs over PG&E. PG&E has already suffered a 21 percent cost overrun of the direct procurement costs, and is likely to have another cost overrun for installation costs.

³⁵ PG&E-1 at 5-32 to 5-36. Between the time PG&E filed its application in January 2004 and the May 27, 2004 Revised Testimony, now admitted into evidence as PG&E-1, the net benefit savings mean shrunk from \$1.77 billion to \$1.2 billion.

³⁶ PG&E-Ex. 1 at 5-35, lns. 13-15.

³⁷ Id. at lns. 15-20.

³⁸ ORA-Ex.. 15 at 17.

Although PG&E did mention in its Rebuttal Testimony, PG&E-3, that it has signed procurement contracts, PG&E has yet to update the procurement cost information provided to the Commission.³⁹ PG&E is apparently on the verge of signing installation contracts for Diablo Canyon.⁴⁰ Essentially, the information provided on procurement and installation costs in PG&E’s Revised Testimony, PG&E-Ex. 1, is stale. PG&E’s estimate of Owner’s Costs also includes unreasonably high AFUDC and contingency costs.

Procurement Costs

PG&E’s Revised Testimony, PG&E-Ex. 3, offered the following cost estimates in Table 4A-3 on page 4A-5:

Description	Direct Cost	Tax 7.25%	Corp Overheads	Escalation	AFUDC	Cntgcy \$ / %	Total With Cntgcy	Total Without Cntgcy
Procurement Contract	121	8	10	0	34	9/5	182	173
Installation Contract	188	0	15	25	55	56/20%	339	283
Owners Costs	102	0	9	13	30	31/20%	185	154
Total	411	8	34	38	119	96/16	706	610

ORA-1, PG&E’s response to an ORA data request, updated the procurement and

Description	Direct Cost	Tax 7.25%	Corp Overhead	Escalation	AFUDC	Cntgcy \$ / %	Total With Cntgcy	Total Without Cntgcy
Procurement Contract	XXXXX	XXX	XXX	X	XXX	XXX	XXXX	XXXX
Installation Contract	XXX	X	XXX	XXX	XXX	XXXXX	XXXX	XXXX
Owners Costs	XXX	X	X	XX	XX	XXXXX	XXX	XXX
Total	XXXXX	XXXX	XX	XXXX	XXXXX	XXXX	XXX	XXXXX

installation cost estimates (emphasis added):

Direct procurement costs are now xx percent higher than PG&E’s forecast from May 2004 in PG&E-Ex. 1. Including overheads, the procurement costs are now xx percent higher than PG&E forecast in May 2004 in PG&E-Ex. 1. After claiming that it

³⁹ PG&E-Ex. 3 at 1-2 to 1-3.

⁴⁰ Id. at 1-2, lns. 29-33.

had reasonable procurement cost estimates in its Revised Testimony, PG&E-Ex. 1, PG&E now tries to explain away its procurement cost overrun in PG&E-Ex. 3: “[p]rimarily because of adverse currency exchange rate changes, but also unexpected increases in the cost of raw materials, the cost of the procurement contract was greater than expected.”⁴¹ Although PG&E has retained a xx percent contingency estimate for procurement costs, there still was not enough money, so it had to ‘reallocate’ contingency money from the installation project phase to cover its procurement cost overrun. PG&E also admitted that although it has signed a procurement contract with Westinghouse, there still might be some additional procurement costs.⁴² PG&E’s failure to successfully forecast its procurement costs leads ORA to the conclusion that it cannot accurately forecast the costs for the replacement projects either.

Installation Costs

Referring to the tables above, the direct installation cost estimate is now 7 percent higher than PG&E’s forecast from May 2004 in PG&E-Ex. 1. The total estimated installation cost including overheads is expected to be 92 percent of PG&E’s original forecast, but that is only because PG&E has moved almost all of the contingency estimate into the direct cost estimates, leaving an inadequate and disingenuous 2 percent installation contingency behind.

While PG&E has not yet signed installation contracts for the replacement projects, ORA has no confidence that PG&E will be able to hold down installation contract costs, especially since PG&E admits that “the installation contracts will not be fixed price contract[s], but rather a time and material contract, with a negotiated fee structure, and thus it requires a greater contingency for unexpected costs even after execution than a fixed price contract.”⁴³ Given the uncertainty of a time and material installation contract, PG&E’s new contingency estimate of only xx percent, versus an original 20 percent is not very convincing. While PG&E used a xx percent contingency in its updated figures, *the*

⁴¹ PG&E-Ex. 3 at 1-2, lns. 16-19. See also 1 RT 92-96.

⁴² 1 RT 80.

⁴³ PG&E-Ex. 3 at 1-3.

company really wants a 10 percent contingency: “[I]t would therefore be imprudent to have a contingency of less than 10 percent of the expected installation contract amount.”⁴⁴
XX.⁴⁵ PG&E also admits that there are only 2 potential installers bidding on its contract⁴⁶, so cost reductions based on competition between installers are unlikely.

Owner’s Costs

By the time PG&E finally gets around to performing the tasks involved with the so-called Owner’s Costs, ORA wonders if there will be any money left in its \$706 million budget. PG&E left unchanged the Owner’s Cost estimate in PG&E-Ex. 1, Table 4A-3. PG&E used a 20 percent contingency factor for Owner’s Costs, but the Company has no workpapers supporting the 20 percent figure.⁴⁷ As discussed below, ORA recommends an 11 percent contingency factor for Owner’s Costs.

AFUDC Costs

PG&E estimated AFUDC costs by combining PG&E’s Test Year 2003 authorized cost of capital of 9.24 percent with an estimated project duration of 58 months before commercial operation.⁴⁸ In hearings, PG&E admitted that it has asked the Commission to reduce its authorized cost of capital to 8.49 percent in 2004 and 8.90 percent in 2005.⁴⁹ PG&E never recalculated its AFUDC cost to reflect the reduced cost of capital it is seeking in the Commission’s Cost of Capital proceeding, A.04-05-023. To make things even more confusing, PG&E’s workpapers show a 15.32 percent AFUDC rate for Diablo Canyon for projects between 55 and 60 months duration.⁵⁰ PG&E’s Rebuttal Testimony,

⁴⁴ PG&E-Ex. 3 at 1-6, lns. 14-16.

⁴⁵ 1 RT 102-103.

⁴⁶ PG&E-Ex. 3 at 1-2, lns. 31-33.

⁴⁷ ORA-Ex. 15 at 11, fn. 45.

⁴⁸ PG&E-Ex. 1 at 4-11 to 4-12.

⁴⁹ 3 RT 404.

⁵⁰ PG&E-Ex. 6 at 110.

PG&E-Ex. 3, tried to explain these inconsistencies away.⁵¹ While PG&E is trying to win the Commission's pre-approval of its \$706 million cost estimate, based on an inflated AFUDC rate, PG&E also wants its cost estimate to be "adjusted for actual inflation rates and cost of capital."⁵² The Commission should reject pre-approval of PG&E's \$706 million cost estimate and also not approve an estimated AFUDC rate for the replacement projects.

ORA's Cost Estimates

ORA's cost estimates for the steam generator replacement project appear in ORA-15 at 6-11. ORA's warning, that "the Commission should be mindful that PG&E's \$706 million figure is merely an estimate, and is likely to change significantly as the replacement projects progress," has been borne out by changing circumstances.⁵³ The Commission should not pre-approve PG&E's \$706 million cost estimate for the steam generator replacement projects. PG&E's signing of two procurement contracts and the expected signing of installation contracts (all at costs exceeding PG&E's original estimates) have overtaken ORA's procurement and installation cost discussions in ORA-15, along with PG&E's cost estimates in PG&E-Ex. 1.

Regarding Owner's costs, ORA still recommends that the Commission reject PG&E's unsupported 20 percent contingency factor, in favor of ORA's 11 percent recommendation.⁵⁴ Although the scope of the Owner's costs are not fully known at this point, it would be better for PG&E to explain to the Commission in additional testimony the reasonableness of significant cost overruns later rather than just assume they will occur as part of a high contingency factor from the outset. Allowing PG&E to have excessive funds allocated to Owner's contingency costs permits PG&E to unreasonably move those funds forward to the installation cost phase, if necessary. As discussed above in the "AFUDC Costs" section, PG&E's \$30 million AFUDC cost estimate overstates

⁵¹ PG&E-Ex. 3 at 6-8 to 6-9.

⁵² PG&E-Ex. 1 at 7-2, lns. 23-24.

⁵³ ORA-Ex. 15 at 6.

⁵⁴ Id. at 11.

expected AFUDC costs, especially if PG&E's recent request to lower its authorized cost of capital in 2004 and 2005 is approved.

5. RATEMAKING AND COST RECOVERY ISSUES

5.1 Legal Authority for the Commission to Approve Rate Recovery of Project Costs

Public Utilities Code section 463 states the following (emphasis added):

the commission shall disallow expenses reflecting the direct or indirect costs resulting from any unreasonable error or omission relating to the planning, construction, or operation of any portion of the corporation's plant *which cost, or is estimated to have cost*, more than fifty million dollars (\$50,000,000), including any expenses resulting from delays caused by any unreasonable error or omission. Nothing in this section prohibits a finding by the commission of other unreasonable or imprudent expenses. This subdivision is a clarification of the existing authority of the commission, is not intended to limit or restrict any power or authority of the commission conferred by any other provision of law, and applies to all matters pending before the commission.

This statute is the basis for an after-the-fact reasonableness review, since it contemplates an after-the-fact review of utility expenditures for reasonableness. Essentially, a utility spends its own money on capital additions or expenses, and then asks the Commission to put its reasonable costs into rates.

Public Utilities Code section 463.5 modifies section 463 to permit pre-approval of utility cost estimates:

Section 463 does not require the commission to undertake a reasonableness review of recorded costs to determine the reasonableness of the costs of each item of an electrical or gas corporation's plant which costs, or is estimated to have cost, more than fifty million dollars (\$50,000,000) where the commission either has established a maximum reasonable cost pursuant to Section 1005.5 or has adopted an estimate of the reasonable costs in any proceeding.

Section 463.5 permits the Commission to either set a maximum reasonable cost for capital expenditures, or pre-approve a reasonable estimate. PG&E's request essentially falls under section 463.5.

5.2 PG&E's Proposal Regarding Reasonableness Review and Cost Recovery

PG&E's proposal regarding reasonableness review and cost recovery can be found in PG&E-Ex. 1 at 7-1 to 7-5. In summary, PG&E requests that the Commission adopt \$706 million, as adjusted for actual inflation rates and cost of capital, as a reasonable and prudent cost for steam generator replacement; if the actual cost is less than \$706 million, the Commission would not require a reasonableness review, but if the actual cost exceeded \$706 million, a reasonableness review would apply; and appropriate ratemaking accounting changes.

ORA's position is simple: the Commission should not pre-approve PG&E's \$706 million cost estimate under section 463.5. While PG&E has signed procurement contracts, the estimated costs for installation and Owner's costs are too uncertain at this time, especially given the contingency levels PG&E is requesting. Determining a "reasonable" cost figure at this time would shift the risk of uncertainty from PG&E to ratepayers, since it would reduce PG&E's incentive to bargain vigorously with suppliers and keep its costs down. If the Commission gives PG&E approval to spend \$706 million, they have no incentive to spend less. PG&E has already demonstrated that it has a problem with controlling costs: PG&E signed procurement contracts that cost significantly more than expected, and PG&E is expected to sign bloated installation contracts. After commercial operation of the proposed projects, PG&E should file an application under section 463 for a reasonableness review of the actual costs of procurement, installation and Owner's costs. Considering the potential size of the capital expenditures for the projects, the Commission should not waive a reasonableness review at this point. Traditional ratemaking policy at the Commission works for ratepayers, and there is no reason to apply section 463.5.

5.3 Alternative Proposals for Recovery of Project Capital Costs/Phase-In

Due to the large size of the addition to rate base that the steam generator replacement projects represent, the Commission should consider phasing-in the steam generator replacement projects capital costs into rate base over three years instead of two to spread out the expected revenue requirement increase. In 2009 and 2010, the years PG&E proposes to change rates related to the steam generator replacement projects, PG&E's ratepayers will still be paying for PG&E's bankruptcy. As ORA stated under cross-examination, the purpose of the phase-in is not to avoid "rate shock"⁵⁵, but to relieve ratepayers of the double burden of paying for PG&E's bankruptcy and a major new capital addition at Diablo Canyon.

The Commission previously approved a rate base phase-in over 10 years for SCE's Palo Verde units.⁵⁶ PG&E is correct that the revenue deferral in the Palo Verde decision totaled \$600 million over a four-year period, but PG&E neglected to mention that the total investment at Palo Verde was \$1.5 billion⁵⁷, more than double the \$706 million estimate for Diablo Canyon's steam generator replacement project. Although ORA has not calculated the net present value benefit to ratepayers from its phase-in proposal, ORA notes that the Commission decided there were *\$110-150 million in net benefits from the Palo Verde phase-in*.⁵⁸ The Commission should adopt ORA's phase-in proposal.

5.4. Aglet Proposal to Guarantee Ratepayer Benefits

ORA does not oppose Aglet's proposal to guarantee ratepayer benefits.⁵⁹ Aglet's point that there is significant risk that PG&E's projected \$1.2 billion in net present value

⁵⁵ 9 RT 1200.

⁵⁶ CPUC D. 86-10-023, 22 CPUC 2d 45 (1986).

⁵⁷ *Id.* at 59.

⁵⁸ *Id.* at 47.

⁵⁹ Aglet-Ex. 1 at 10-12.

savings may not be achieved is well taken. It is instructive that when Aglet proposed to share half of the estimated \$1.2 billion net savings with ratepayers, PG&E immediately got cold feet.⁶⁰ While PG&E is happy to propose shifting the risk to ratepayers of a disallowance associated with an after-the-fact reasonableness review⁶¹, PG&E shies away from the supposed “asymmetrical risk” of Aglet’s sharing proposal. The Commission should carefully consider Aglet’s sharing proposal.

5.5. Other Ratemaking Issues

ORA has not identified any additional ratemaking issues, but ORA reserves the right to comment further on this subject in its Reply Brief.

6. TIMING OF COMMISSION DECISION AND CEQA REVIEW

ORA takes no position on the timing of the Commission’s interim decision and CEQA review. ORA reserves the right to comment further on this issue in its Reply Brief.

7. WESTINGHOUSE ISSUES

[CONFIDENTIAL – FILED UNDER SEAL]

⁶⁰ PG&E-ex. 3 at 6-6.

⁶¹ PG&E-Ex. 1 at 7-5.

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8. CONCLUSION

For all the foregoing reasons, and for the reasons set forth in its testimony, ORA asks that its recommendations be adopted.

Respectfully submitted,

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October 29, 2004

CERTIFICATE OF SERVICE

I hereby certify that I have this day served a copy of the foregoing document
“**OPENING BRIEF OF THE OFFICE OF RATEPAYER ADVOCATES**” in **A.04-01-009**.

A copy was served as follows:

BY E-MAIL: I sent a true copy via e-mail to all known parties of record who have provided e-mail addresses.

BY MAIL: I sent a true copy via first-class mail to all known parties of record.

Executed in San Francisco, California, on the 29th day of October, 2004.

Halina Marcinkowski