

Application: _____
(U 39 M)
Exhibit No.: (PG&E-5)
Date: December 21, 2009
Witness: Various

PACIFIC GAS AND ELECTRIC COMPANY

2011 GENERAL RATE CASE

PREPARED TESTIMONY

**EXHIBIT (PG&E-5)
ENERGY SUPPLY**



PACIFIC GAS AND ELECTRIC COMPANY
CHAPTER 4
NUCLEAR OPERATIONS COSTS

1 The recommended schedule was developed so that the work
2 would not overload resources, budget and manpower in any given
3 year. Delaying these projects will have an adverse impact on DCP
4 safety and reliability and the I&C Long-Term Strategy. Replacing
5 these systems using current technology according to the plan will
6 enable DCP to benefit from the new systems earlier and to enjoy
7 the benefits for a longer period of time. DCP will achieve
8 increased reliability with reduced maintenance costs. The new
9 systems will be able to take the plant to the end of its license.

10 The top I&C system replacements are:

11 **(a) Hagan 7100 Controls for Reactor Pressurizer**

12 The Westinghouse Hagan 7100 Process Control System
13 (PCS) equipment is original plant equipment which has become
14 antiquated and obsolete. The system is based on 1970s analog
15 technology that is difficult to maintain. The PCS converts
16 physical plant parameters such as temperature, pressure, level,
17 and flow into electrical signals. These signals are used for plant
18 control, remote process indication, and computer monitoring.
19 These original analog controls, vintage 1970, are no longer
20 manufactured and there is not a sufficiently large owners' group
21 in the nuclear industry to help with remanufacturing these
22 controls. The new design will remove and replace the existing
23 equipment in the control racks. The present system will be
24 replaced with the preferred DCP common platform which is a
25 state-of-the-art Programmable Logic Controller (PLC) that
26 provides fault tolerance by means of Triple-Modular Redundant
27 architecture. The new system will be built into the existing
28 control racks which will be physically modified as required to
29 accommodate mounting of the equipment and seismic
30 qualification of the racks. New Auto/Manual hand stations will
31 be installed at both the control room vertical boards and the hot
32 shutdown panel. This project is being done in conjunction with
33 Eagle 21 replacement (referred to below) because of defense in
34 depth and diversity requirements by the NRC Branch Technical

1 Position (BTP) 7-19. This project will address the Auxiliary
2 Feedwater (AFW) controls that are currently experiencing
3 performance challenges status along with many other
4 obsolescence and maintenance issues. See workpaper
5 WP 4-38.

6 **(b) Eagle 21 Replacement**

7 When Eagle 21 was installed in 1994, it replaced some of
8 the Hagan 7100 Process Control modules. The control racks
9 and control board still contain many of these old analog
10 modules. There are also Fischer modules for AFW and
11 Condenser Hotwell Level Control that are obsolete. The Hagan
12 and Fischer modules are approaching end of life and are very
13 hard to work on because of the older technology and
14 obsolescence of parts. They currently have several issues that
15 cannot be resolved by either PG&E or Westinghouse. In order
16 to replace these systems with a digital platform, a Diversity and
17 Defense in Depth analysis must be performed. This project is a
18 multi-year project which will require a License Amendment
19 Request (LAR) to be submitted to the NRC. Currently the
20 estimated review time for an LAR is two years. It is PG&E's
21 intent to replace the old systems with a current common
22 platform based on the I&C Long-Term Strategy to increase
23 reliability, reduce maintenance, and increase safety of the plant.
24 The resulting architecture will be based on the I&C Long-Term
25 Strategy to minimize the affects of obsolescence and to reduce
26 the number of different systems at the plant. Based on the
27 results of the diversity analysis, PG&E will then submit an LAR
28 to the NRC for review and approval and install the new system
29 during 1R16. See workpaper WP 4-21.

30 **(7) Polar Crane**

31 The reliability of the Polar Crane has declined over the past
32 several outages. Several relays, contactors, wiring, and control
33 components have failed, which result in forced outages for this

1 The NRC provides oversight and inspection of all aspects of
2 the program, through the reactor oversight process. As such,
3 Emergency Planning is one of the cornerstone activities being
4 evaluated by the NRC. Through this program of inspection,
5 Emergency Planning has three federally-evaluated performance
6 indicators; drill and exercise performance (involving
7 classifications and notifications), key emergency response
8 organization drill participation, and alert and notification system
9 performance. DCPD maintains these three indicators at or
10 above the industry average, which is well into the NRC “green
11 band.”

12 The Emergency Planning Group is also responsible for
13 coordination with offsite agencies, including the county of
14 San Luis Obispo (the County) Office of Emergency Services
15 and the state of California Office of Emergency Services. To
16 that end, the Emergency Planning group works with Federal
17 Emergency Management Administration (FEMA) and is
18 bounded by the federally mandated *Radiological Emergency*
19 *Preparedness* programs and procedures. Of significance offsite
20 is maintenance, operation, and testing of the Alert and
21 Notification System that includes 131 early warning system
22 sirens throughout the county.

23 In compliance with state law, DCPD Emergency Planning
24 provides significant funding to both the state and county through
25 the nuclear power plant fund. This fund is used by the state and
26 county to develop and maintain offsite response capabilities.

27 **(d) Fire Protection Group**

28 The Fire Protection Group: (1) implements NRC required
29 minimum fire brigade staffing 365 days per year, 24 hours per
30 day; (2) develops and conducts all fire brigade training;
31 (3) provides emergency medical technician response to medical
32 emergencies; (4) provides confined space rescue response as
33 required by OSHA; (5) provides emergency response to
34 hazardous materials releases; and (6) performs routine

1 maintenance and surveillance on fire protection systems of our
2 efforts during an emergency. Additional funds are provided
3 annually to FEMA.

4 **(e) Industrial Safety Department**

5 The Industrial Safety Department is responsible for
6 overseeing the Industrial Safety Program at DCPD.
7 Additionally, the Industrial Safety Department provides oversight
8 of the DCPD Medical Facility.

9 The goal of the Industrial Safety Program is to eliminate
10 employee work-related injuries and illnesses by creating a safe
11 and healthy work environment.

12 The Industrial Safety Department ensures that work
13 practices and conditions at DCPD comply with California OSHA
14 regulations, PG&E corporate safety policies, and various other
15 written standards and guidelines. The Industrial Safety
16 Department also provides oversight of the DCPD medical
17 facility. The medical facility provides required work-related job
18 physicals and provides treatment for work-related injuries.

19 **(f) Access Control Group**

20 The Access Control Group manages access to DCPD as
21 mandated by NRC Requirements found at 10 C.R.R. 73.56 and
22 10 C.R.R. 26. The Access Control Group grants and maintains
23 security clearance to PG&E employees and contractors for
24 access to the area surrounding and including DCPD that is
25 encompassed by physical barriers. This includes personnel
26 background investigations, psychological evaluations, Federal
27 Bureau of Investigation (FBI) criminal history reviews, credit
28 reports, and site and security badge preparation. The Access
29 Control Group manages the FFD program at DCPD, conducts
30 drug and alcohol testing, case management, drug detection,
31 pre-employment drug and FFD testing, and continual behavioral
32 observation.

33 The Access Control Group also manages the site security
34 system that utilizes the DCPD Security badges as a standard

- 1 • Table 4-4 displays the MWC expenses for recorded adjusted year 2008 and
2 forecast years 2009 to 2011.

**TABLE 4-3
PACIFIC GAS AND ELECTRIC COMPANY
NUCLEAR OPERATIONS COSTS
CAPITAL EXPENDITURES BY MAJOR WORK CATEGORY
(THOUSANDS OF NOMINAL DOLLARS)**

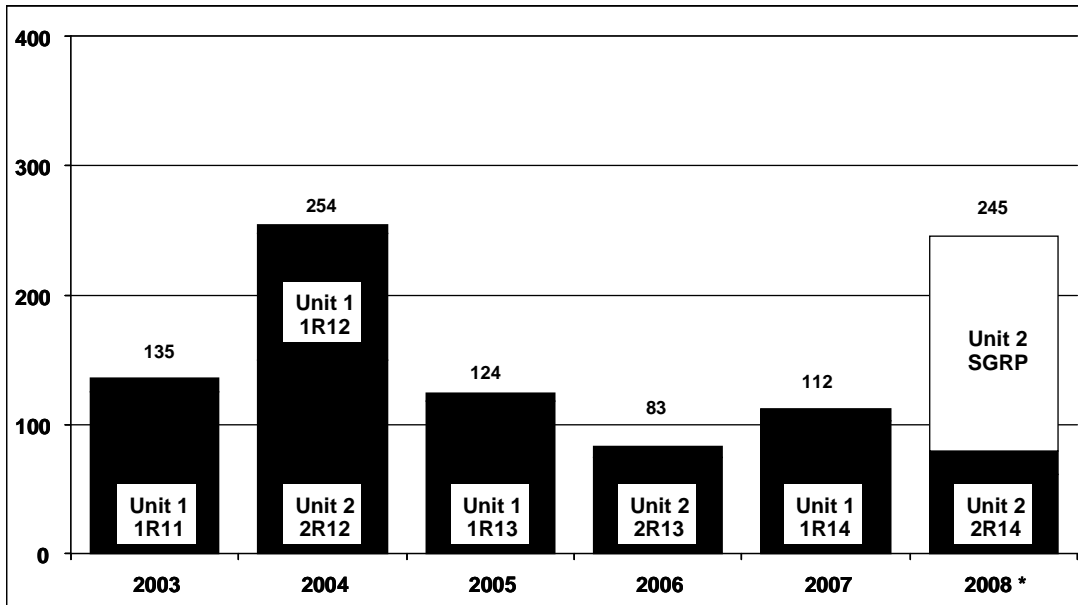
Line No.	MWC	Subprogram/Title	2008 Recorded	2009 Forecast	2010 Forecast	2011 Forecast	2012 Forecast	2013 Forecast
1	3	Office Furniture & Equipment	\$ 209	\$ 216	\$ 217	\$ 220	\$ 220	\$ 225
2	4	Fleet / Auto Equip	\$ 1,333	\$ 1,644	\$ 946	\$ 2,408	\$ 2,404	\$ 2,400
3	5	Tools & Equipment	\$ 2,057	\$ 1,684	\$ 946	\$ 1,806	\$ 1,803	\$ 1,800
4	20	DCPP Capital	\$ 363,412	\$ 292,331	\$ 168,169	\$ 149,766	\$ 170,173	\$ 146,775
5		Overall Result	\$367,011	\$295,875	\$170,278	\$154,200	\$174,600	\$151,200

**TABLE 4-4
PACIFIC GAS AND ELECTRIC COMPANY
NUCLEAR OPERATIONS COSTS
EXPENSES BY MAJOR WORK CATEGORY*
(THOUSANDS OF NOMINAL DOLLARS)**

Line No.	MWC	Description	2008 Recorded Adjusted	2009 Forecast	2010 Forecast	2011 Forecast
1	AB	Support	\$1,484	\$2,082	\$2,414	\$2,510
2	AK	Manage Environmental Oper	\$3,509	\$3,934	\$4,107	\$4,724
3	BP	Manage DCPD Business	\$7,032	\$8,019	\$9,519	\$10,401
4	BQ	DCPP Support Services	\$3,812	\$6,262	\$5,901	\$10,993
5	BR	Operate DCPD Plant	\$81,576	\$87,401	\$90,665	\$101,896
6	BS	Maintain DCPD Plant Assets	\$155,027	\$150,934	\$111,780	\$125,552
7	BT	Enhance DCPD Personnel Perf	\$12,431	\$13,435	\$13,906	\$15,486
8	BU	Procure DCPD Materials & Svcs	\$4			
9	BV	Maintain DCPD Plant Configurtn	\$29,641	\$57,892	\$59,038	\$59,985
10	CR	Mnge Waste Disp & Transp	\$148			
11	EO	Provide Nuclear Support	\$180			
12	IE	Envrn Remedttn, Non-HSM Recvy	\$10	\$34	\$46	\$50
13		Overall Result	\$294,853	\$329,992	\$297,376	\$331,597

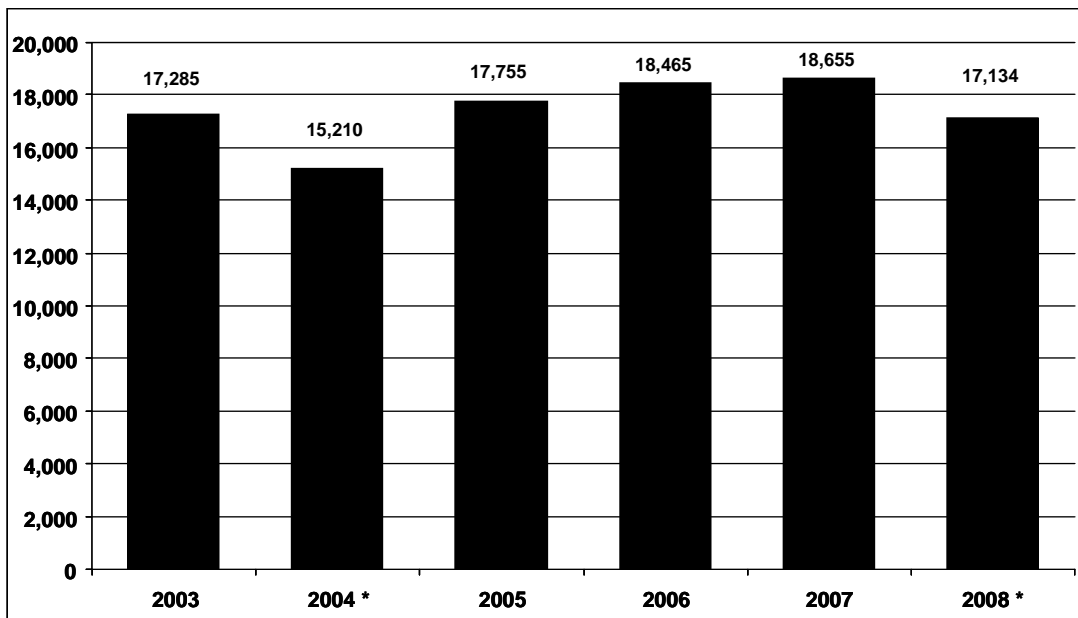
* These dollars are stated in SAP dollars. SAP dollars include certain labor-driven adders such as employee benefits and payroll taxes.

**FIGURE 4-2
PACIFIC GAS AND ELECTRIC COMPANY
DIABLO CANYON POWER PLANT
COLLECTIVE RADIATION EXPOSURE (PERSON-REM)**



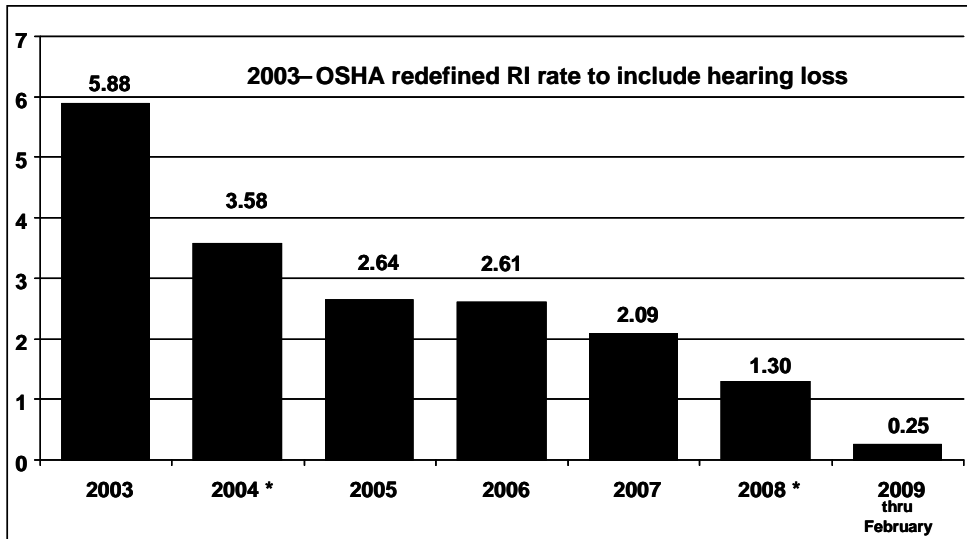
•2008 - longer than normal 66 -day 2R14 refueling outage due to the Steam Generator Replacement Project (SGRP)

**FIGURE 4-3
PACIFIC GAS AND ELECTRIC COMPANY
DIABLO CANYON POWER PLANT NET GENERATION (GWH)**



* 2004 - Double Refueling Outage Year
2008 - 66-Day 2R14 Refueling Outage to Replace Steam Generators

FIGURE 4-6
PACIFIC GAS AND ELECTRIC COMPANY
DIABLO CANYON POWER PLANT OSHA RECORDABLE INJURY (RI) RATE
NUMBER OF INJURIES PER 200,000 HOURS WORKED



* 2004- Double Refueling Outage Year
2008- 66-Day 2R14 Refueling Outage to Replace Steam Generators

FIGURE 4-7
PACIFIC GAS AND ELECTRIC COMPANY
DIABLO CANYON POWER PLANT FORCED LOSS RATE (%)

