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ALJ : Darling/Dudney
Witness : Logan



**OFFICE OF RATEPAYER ADVOCATES
CALIFORNIA PUBLIC UTILITIES COMMISSION**

**Report on the Results of Operations
for
Southern California Edison Company
General Rate Case
Test Year 2015**

Nuclear Generation Costs

San Francisco, California
August 4, 2014

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NUCLEAR GENERATION COSTS

I. INTRODUCTION

This exhibit presents the analyses and recommendations of the Office of Ratepayer Advocates (ORA) regarding Southern California Edison Company's (SCE or Edison) forecasts of Nuclear Generation Operation and Maintenance (O&M) expenses for Test Year (TY) 2015, and capital expenditures for 2013 through 2015.

Per the Assigned Commissioner's Ruling and Scoping Memo, costs associated with the San Onofre Nuclear Generating Station (SONGS) have been removed from SCE's GRC TY 2015 forecast.¹ Accordingly, the nuclear generation costs included in this GRC are only for SCE's share of the Palo Verde Nuclear Generating Station (PVNGS), units 1, 2, and 3. The PVNGS is operated by Arizona Public Service (APS), which owns 29.1 percent of the facility. SCE's share of PVNGS is 15.8 percent.²

The maximum output of PVNGS is 3,937 megawatts and SCE's share is 622 megawatts. This power is scheduled into the California Independent System Operator's (CAISO) Integrated Forward Market (IFM) on a daily basis. Power delivery into the CAISO market typically occurs over the Devers-Palo Verde 500 KV transmission line.³ PVNGS sends about 5,000 gwh of energy per year to SCE, which is approximately 6 percent of its total energy requirements.⁴

SCE's *non-nuclear* generation costs are addressed in Exhibit ORA-07.

¹ Joint Scoping Memo of Assigned Commissioner and Assigned Administrative Law Judges, dated March 27, 2014, p. 4.

² The other PVNGS participants and their shares: Salt River Project (17.5 percent), El Paso Electric (15.8 percent), Public Service of New Mexico (10.2 percent), Los Angeles Department of Water and power (5.7 percent), and Southern California Public Power Authority (5.9 percent).

³ SCE response to ORA data request DRA-038-SJL, Q.1 & Q.2.

⁴ SCE response to ORA data request DRA-038-SJL, Q.3. Total energy requirements from SCE's Annual Financial and Statistical Reports from www.edison.com.

1 **II. SUMMARY OF RECOMMENDATIONS**

2 The following summarizes ORA's recommendations associated with PVNGS
3 O&M expenses for TY 2015 and capital expenditures for 2013 through 2015:

- 4 • ORA recommends no adjustments to the PVNGS O&M expense forecast
- 5 • ORA recommends no adjustments to the PVNGS capital expenditure
6 forecast

7 Table 5-1 compares ORA's and SCE's TY 2015 forecasts of nuclear
8 generation expenses:

9 **Table 5-1**
10 **Nuclear Generation Expenses for TY 2015**
11 **(In Millions of 2012 Dollars)**

Description (a)	ORA Recommended (b)	SCE Proposed⁵ (c)	Amount SCE>ORA (d=c-b)	Percentage SCE>ORA (e=d/b)
PVNGS	\$73.8	\$73.8	\$0.0	0%
Total	\$73.8	\$73.8	\$0.0	0%

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13 SCE's PVNGS TY 2015 O&M forecast is based on the most recent recorded
14 data available for its application, calendar year 2012. Based on the unadjusted 2013
15 data recently provided by SCE, actual expenses have decreased by about \$1.3
16 million.⁶ This decrease, and the fact that the numbers are unadjusted, is not
17 significant enough to modify the TY 2015 forecast at this time.

18 Table 5-2 compares ORA's and SCE's 2013-2015 forecasts of nuclear
19 generation capital expenditures:

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⁵ Ex. SCE-2, Vol. 3, p. 2.

⁶ SCE Response to ORA data request DRA-Verbal-057, PVNGS spreadsheet data.

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Table 5-2
Nuclear Generation Capital Expenditures for 2013-2015
(In Millions of Nominal Dollars)

Description	ORA Recommended			SCE Proposed ⁷		
	2013	2014	2015	2013	2014	2015
PVNGS	\$30.8	\$32.4	\$31.6	\$30.8	\$32.4	\$31.6
Total	\$30.8	\$32.4	\$31.6	\$30.8	\$32.4	\$31.6

4 **III. DISCUSSION / ANALYSIS OF PVNGS COSTS**

5 **A. Overview of SCE’s Request**

6 SCE’s PVNGS O&M cost estimate is based on the last-recorded-year
7 method, which was chosen after analyzing the other traditional forecasting
8 methods.⁸ The capital expenditure forecast is based on the budget provided by
9 APS. APS provides this forecast after review and approval by the Administrative and
10 the Engineering & Operating Committees. SCE representatives participate in these
11 committee activities.⁹

12 **B. PVNGS O&M Expenses**

13 All PVNGS O&M costs are booked to FERC Account 524, miscellaneous
14 nuclear power expenses.¹⁰ The historical and forecast costs are shown below.

15 **Table 5-3**
16 **2008-2012 Recorded / 2015 Forecast O&M Expenses**
17 **(in Millions of 2012 Dollars)**

Description	2008	2009	2010	2011	2012	2015
FERC Account 524	\$97.6	\$88.3	\$87.2	\$78.3	\$73.8	\$73.8

18 Source: 2008-2012 data from Ex. SCE-02, Vol. 03, p. 2.

⁷ Ex. SCE-2, Vol. 3, p. 18.

⁸ Ex. SCE-2, Vol. 3, p. 5.

⁹ SCE response to ORA data request DRA-038-SJL, Q.5.

¹⁰ The Federal Energy Regulatory Commission (FERC) Uniform System of Accounts states: *This account shall include the cost of labor, materials used and expenses incurred which are not specifically provided for or are not readily assignable to other nuclear generation operation accounts.*

1 The recorded data shows a downward trend in O&M expenses since 2008.
2 SCE cites improved productivity and reduced refueling outage expenses as the cost
3 reduction drivers.¹¹

4 1. Productivity Improvements

5 SCE's testimony discusses monthly reports produced by PVNGS
6 management that monitor the differences between budgeted and recorded costs.¹²
7 ORA requested copies of the monthly reports, which were provided for the years
8 2010-2012.¹³ A key productivity metric contained in the reports is the O&M Cost per
9 Kilowatt Hour (cents per kwhr). The data for the recent three years is as follows:

10 **Table 5-4**
11 **PVNGS O&M Cost Per Kwhr***

<u>Year:</u>	2010	2011	2012
<u>Cents/kwhr:</u>	2.111	2.073	2.001

12 *Without nuclear fuel expense. Source: PVNGS Executive Cost Reports.

13 The data reflects the trend of decreasing O&M costs, consistent with SCE's
14 testimony.

15 2. Refueling Outage (RFO) Cost Reduction

16 Based on an average of 18 months per fuel cycle, and the fact that PVNGS
17 has three units, SCE forecasts two refueling outages (RFO) per year for the facility.
18 Therefore, the TY 2015 reflects two RFO's. The routine O&M activities during an
19 RFO include (1) shut down and cool down of the reactor, (2) removal of the reactor
20 vessel head and fuel replacement, (3) reassembly of the reactor vessel, and (4) heat
21 up and start-up of the reactor. Other routine and specific maintenance projects are
22 also performed.¹⁴

¹¹ Ex. SCE-2, Vol. 3, p. 9.

¹² Ex. SCE-02, Vol. 3, p. 4.

¹³ SCE response to ORA data request DRA-038-SJL, Q.8.

¹⁴ Ex. SCE-2, Vol. 3, p. 6.

1 APS prepares the scope and cost forecast for the RFO's. However, SCE did
2 not include this information in the testimony or workpapers. ORA requested the
3 historical and forecast RFO cost information. SCE provided the following:

4 **Table 5-5**
5 **2009-2013 Recorded / 2015 Forecast RFO O&M Expenses**
6 **(in Millions of Nominal Dollars)**

Description	2009	2010	2011	2012	2013	2014	2015
PVNGS RFO Total*	\$83.2	\$69.8	\$66.2	\$61.4	\$62.1	\$65.6	\$54.6
SCE Share	\$13.1	\$11.0	\$10.5	\$9.7	\$9.8	\$10.4	\$8.6

7 *Source: SCE response to data request DRA-297-SJL, Q.1.

8
9 The data show a decline in the RFO portion of the total PVNGS O&M expense,
10 consistent with SCE's testimony.

11 Based on review of SCE's testimony, workpapers, and the data request
12 responses discussed above, ORA accepts SCE's PVNGS O&M forecast for TY
13 2015.

14 **C. PVNGS Capital Expenditures**

15 SCE forecasts \$30.8 million, \$32.4 million, and \$31.6 million for TY 2013,
16 2014, and 2015, respectively. Similar to the O&M forecast, the capital expenditure
17 forecast for PVNGS is lower than previously authorized.¹⁵ Newer, emerging projects
18 are forecast in the Fukushima and Water Reclamation Facility categories. The
19 budgets for projects in the Plant Modifications and the Equipment & Replacement
20 categories have level or downward spending patterns.¹⁶

21 **1. Water Reclamation Facility Projects**

22 Cooling water for PVNGS is provided by a dedicated water reclamation facility
23 (WRF) which receives water from various local sewage treatment plants. SCE
24 describes eight different project activities related to the facility's various components,

¹⁵ For example, Decision (D.)12-11-051, TY 2012, authorized a capital expenditure budget for PVNGS of \$36.3 million, nominal dollars.

¹⁶ Ex. SCE-02, Vol. 3, p. 19.

1 machinery, and equipment, much of which is over 25 years old.¹⁷ The capital
2 expenditure forecast for these projects total \$4.1 million, \$4.4 million, and \$4.4
3 million for 2013, 2014, and 2015, respectively. The justification for these projects
4 appears reasonable, based on the testimony and workpapers.¹⁸

5 **2. Fukushima Projects**

6 In response to the nuclear power plant accident at Fukushima Dai-ichi in
7 Japan following the 2011 earthquake and tsunami, the United States Nuclear
8 Regulatory Commission (NRC) mandates certain upgrades, improvements, and
9 seismic monitoring activities at U.S. nuclear power facilities based on lessons
10 learned. SCE identifies three projects in this category – (1) Plant Two-Way Radio
11 Equipment, (2) Seismic Hazards Validation, and (3) Emergency Equipment Storage
12 Facility.¹⁹ The capital spending forecast for the three-year GRC cycle totals \$4.4
13 million for Fukushima-related projects.²⁰ This forecast appears reasonable.

14 **IV. BILLING AND REPORTING ISSUES**

15 **1. Billing Issues**

16 ORA requested five years of APS-SCE billing information.²¹ The data
17 received from SCE is rather voluminous and raw. For example, the invoice data
18 could only be provided on a monthly basis – it was not available on an annual basis.
19 Additionally, the monthly invoices reflect O&M and capital combined, and apparently
20 some or all of administrative & general expenses. The next GRC should revisit the
21 issue of the invoice and billing process, and the level of detail that should be made
22 available by SCE (through APS).

¹⁷ Ex. SCE-02, Vol. 3, pp. 27-34.

¹⁸ *Palo Verde Area-Wide Aquifer Protection Permit No. P-100388*, dated February 10, 2010, issued by the Arizona Department of Environmental Quality. Workpapers SCE-02, Vol. 03, pp. 241-395.

¹⁹ Ex. SCE-02, Vol. 3, pp. 38-39.

²⁰ Ex. SCE-02, Vol. 3, p. 19.

1 A more useful tool for analysis of the APS-SCE billing process is contained in
2 the annual audit reports entitled *Palo Verde Nuclear Generating Station Operation*
3 *and Maintenance and Capital Improvement Costs Audit*. ORA requested these audit
4 reports and received those for calendar years 2003-2011.²² These annual audits are
5 performed by the six non-operating participants of PVNGS. In other words, these
6 joint audits are conducted independent of APS, from the point of view of the
7 companies billed by APS, for their share of PVNGS costs.

8 The audit findings and any subsequent adjustments to the participants'
9 billings have relatively small monetary value compared to total billings. APS appears
10 to cooperate with the auditors, and seems to make billing adjustments based on
11 audit findings in most instances. However, certain issues were elevated above the
12 Audit Committee to the Engineering & Operating Committee based on the audits for
13 2010 and 2011. Whether those issues were addressed and resolved during the 2012
14 audit is unknown at this time, as ORA's request for that report is pending. ORA
15 reserves the right to address these unresolved audit issues when the information is
16 available, whether in this GRC or the next.

17 **2. Reporting Issues**

18 In the last GRC, the Commission authorized capital spending of \$3.8 million
19 for the Nuclear and Technical Manual Replacement (NATM) project.²³ The
20 Commission also required SCE to ensure that the authorized spending was used
21 specifically for the NATM project. SCE's testimony indicates the following spending
22 on this project:
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(Continued from previous page)

²¹ SCE response to ORA data request DRA-038-SJL, Q.4.

²² SCE response to ORA data requests DRA-038-SJL, Q.8, and DRA-301-SJL, Q.3. ORA's request for the calendar year 2012 audit report is pending.

²³ D.12-11-051, p. 44.

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Table 5-6
NATM Project (PVNGS) Capital Expenditures
\$ Millions (Nominal)

	Prior Costs	2013 Forecast	2014 Forecast	2015 Forecast	2016 Forecast	2017 Forecast	Total
NATM	\$3.9	\$1.1	\$1.1	\$0.1	\$0.0	\$0.0	\$6.3

4 Source: Ex. SCE-02, Vol. 3, Table IX-2, p. 19.

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6 It appears that most, but not all, of NATM spending will be complete by TY
7 2015. ORA recommends that SCE provide a detailed report on the completed NATM
8 project and final spending in the next GRC. ORA also recommends that SCE report
9 in the next GRC how SCE ensures that authorized PVNGS capital budgets are
10 spent on the projects authorized by this Commission.