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ALJ	:	S. Roscow
Witness	:	T. Renaghan

OFFICE OF RATEPAYER ADVOCATES
CALIFORNIA PUBLIC UTILITIES COMMISSION

Report on the Results of Operations for Pacific Gas and Electric Company Test Year 2017 General Rate Case

Cost Escalation

San Francisco, California
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COST ESCALATION

I. INTRODUCTION

This exhibit presents the analyses and recommendations of the Office of Ratepayer Advocates (ORA) regarding Pacific Gas and Electric Company's (PG&E) forecasts of labor and non-labor and capital related cost escalation for 2015, 2016 and Test Year (TY) 2017. Escalation is the rate of inflation for the costs of the utility's purchase of labor, materials and capital related items.

PG&E's labor escalation proposals are presented in Exhibit (Ex.) PG&E-8, Chapter 3, while PG&E's non-labor and capital escalation proposals are presented in Ex. PG&E-12, Chapter 3.

II. SUMMARY OF RECOMMENDATIONS

In this exhibit, ORA presents its forecasts of PG&E's labor, non-labor, and capital escalation rates for 2015, 2016 and 2017. As ORA's forecasts are not significantly different than PG&E's, and given that escalation rates will be updated at a later date, ORA does not oppose PG&E's escalation rate forecasts and has not altered any escalation rate inputs in the Results of Operations (RO) model.

III. SUMMARY OF ORA and PG&E FORECASTS

ORA and PG&E developed company-wide labor escalation rates for 2015, 2016 and TY 2017, as well non-labor operations and maintenance (O&M) escalation rates by functional categories. Specifically, ORA and PG&E developed non-labor escalation rates for Electric Distribution, Nuclear Generation, Hydro Generation, Steam (Fossil Fuel) Generation, Gas Distribution, Electric Administrative and General (A&G), Gas Distribution A&G and company-wide A&G.[1] The results are

[1] ORA's and PG&E's A&G escalation rates reflect the removal of health care cost escalation. This is discussed in greater detail in section V of this testimony.

reported in Tables 5-1 and 5-2. ORA's and PG&E's results differ because ORA relied upon a more recent forecast from the IHS Global Insight Power Planner (Global Insight). PG&E relied upon the Global Insight forecast from the 4th quarter of 2014 while ORA relied upon the Global Insight forecast from the 4th quarter of 2015.

- For labor escalation, ORA does not oppose PG&E's proposed annual escalation rates of 2.79 % for 2015, 3.06 % for 2016, and 3.20 % for TY 2017. On a compound basis these represent annual increases of 2.79 %, 5.90 %, and 9.30 %, respectively, for 2015, 2016, and 2017.

- For electric distribution ORA forecasts annual non-labor escalation rates of -0.75 % in 2015, no change in 2016, and a 1.89 % increase in 2017. For 2015, PG&E recommends a decrease of 0.10 %, and increases of 1.60 % and 1.87 %, respectively, for 2016 and test year 2017. On a compound basis, ORA's annual escalation rates yield an escalation rate of 1.11 % for TY 2017. PG&E's annual escalation rates yield a TY compound rate of 3.40 %.

- For nuclear generation ORA forecasts annual escalation rates of -0.37 % for 2015, 0.42 % in 2016, and 2.24 % in 2017 %. With compounding, ORA's test year non-labor escalation rate equals 2.3 %. PG&E recommends annual non-labor nuclear escalation rates of -0.20 % in 2015, 1.90 % in 2016, and 2.26 % in 2017. Compounding PG&E's annual escalation rates yields a compound TY escalation rate of 4.00 %.

- For Hydro Generation, ORA forecasts a decline in non-labor escalation of 1.38 % in 2015, followed by increases of 0.02 % in 2016, and 2.35 % in TY 2017. PG&E forecasts that hydro generation non-labor escalation will decline by 1.10 % in 2015, followed by increases of 2.02 % in 2016, and 2.58 % in 2017. Compounding ORA's annual non-labor escalation rates yields a TY 2017 escalation rate of 1.00 %. With compounding PG&E's compound TY 2017 hydro generation escalation rate equals 3.50 %.

- For Fossil Fuel Generation, ORA forecasts a decline in escalation of 0.19 % in 2015. For 2016 and 2017, ORA forecasts increases in non-labor escalation of 0.42 % and 2.35 %, respectively, for 2016 and 2017. PG&E recommends increases in non-labor escalation of 0.20 % in 2015, 2.00 % in 2016, and 2.54 % in 2017. On a compound basis ORA forecasts a fossil fuel 2017 non-labor escalation rate of 2.50 % while PG&E recommends a TY compound escalation rate of 4.80 %.

- For gas distribution non-labor expenses ORA forecasts annual non-labor escalation rates for 2015, 2016, and 2017, of 2.32 %, 2.39 %, and 2.34 %, respectively. PG&E projects a decline in gas distribution

non-labor escalation of 0.70 % in 2015, followed by increases of 2.11 % in 2015, and 2.56 % in TY 2017. Compounding ORA's annual rates yields a compound test year non-labor gas distribution escalation rate of 9.20 %. Compounding PG&E's annual rates yields a test year non-labor gas distribution escalation of 4.0 %.

- For electric department A&G, ORA forecasts annual non-labor escalation rates of 1.65 % in 2015, 1.75 % in 2016, and 2.32 % in 2017. Compounding these annual rates yields a TY escalation rate of 6.50 %. PG&E recommends annual escalation rates of 1.55 %, 2.19 % and 2.43 %, respectively, for 2015, 2016, and 2017. On a compound basis PG&E's annual escalation rates yield a compound TY 2017 escalation rate of 5.30 %.

- For gas department A&G, ORA forecasts annual escalation rates of 1.61 %, 1.52 %, and 2.05 %, respectively, for 2015, 2016, and 2017. Compounding these annual rates yields a TY 2017 non-labor escalation rate of 5.30 %. PG&E recommends annual escalation rates of 1.56 % for 2015, 1.92 % in 2016, and 2.26 % in TY 2017. Compounding these annual rates yields a test year recommended escalation rate of 5.80 %.

- For company-wide A&G non-labor escalation ORA forecasts escalation rates of 1.64 % in 2015, 1.68 % in 2016, and 2.23 % in 2017. On a compound basis ORA forecasts a company-wide non-labor escalation rate of 5.7 %. PG&E recommends annual company-wide non-labor escalation rates of 1.55 %, 2.10 %, and 2.43 % for the 2015 – 2017 period. Compounding these annual rates yields a recommended TY 2017 non-labor company-wide A&G escalation rate of 6.20 %.

ORA and PG&E also developed capital related escalation rates for Electric Distribution, Nuclear Generation, Hydro Generation, Steam (Fossil) Generation, Gas Distribution Plant, and Common Plant. The results are reported in Tables 5-3 and 5-4. ORA's capital escalation rates reflect the results from the more recent 4th quarter 2015 Global Insight forecast while PG&E's results are based on the earlier 4th quarter 2014 Global Insight forecast.

- For electric distribution plant or capital escalation ORA forecasts annual increases of 2.76 %, 1.89 %, and 2.08 %, respectively, for 2015, 2016, and 2017. When compounded these annual rates yield a 2017 compound escalation rate of 6.90 %. PG&E recommends annual electric distribution plant escalation rates of 2.07 % in 2015, 2.28 % in 2016, and 2.81 % in TY 2017. Compounding these annual rates yields a TY recommended compound escalation rate of 7.30 %.

- For nuclear generation plant ORA forecasts annual escalation rates of 1.98 % in 2015, 1.14 % in 2016, and 1.90 % in 2017. Compounding these annual rates yields a TY escalation rate of 5.10 %. For 2015, 2016, and 2017, PG&E recommends, respectively, annual escalation rates of 1.80 %, 2.46 % and 2.57 %. On a compound basis PG&E recommends a TY nuclear plant escalation rate of 7.00 %.

- For hydro generation plant ORA forecasts, respectively, annual escalation rates of 1.73 %, 1.82 %, and 2.40 %, for 2015, 2016, 2017. Compounding these annual rates yields a compound TY escalation rate of 6.1 %. PG&E projects that hydro plant escalation will increase by 1.52 % in 2015, 2.43 % in 2016, and 2.57 % in 2017. On a compound basis this is equivalent to an escalation rate of 6.70 %.

- For gas distribution plant[2] ORA forecasts annual escalation rates of 2.76 %, 1.81 %, and 1.75 %, for 2015, 2016, and 2017, respectively. For these same year PG&E recommends gas plant escalation rates of 1.58 %, 2.17 %, and 2.42 %. Compounding ORA's annual escalation rates over the 2014 – 2017 period yields a compound test year escalation rate of 6.4 percent. When PG&E's annual escalation rates are compounded over this same period, it yields a 2017 compound escalation rate of 6.30 %.

- For common plant[3] ORA forecasts annual escalation rates of 3.96 %, 1.57 % and 1.47 %, respectively, for 2015, 2016, and 2017. Compounding ORA's annual rates yields a TY compound escalation rate of 7.1 %. For 2015, 2016, and 2017, PG&E recommends escalation rates of 2.52 % in 2015, 2.54 % in 2016, and 2.40 % in TY 2017. Compounding PG&E's annual rates yields a test year compound common plant escalation rate of 7.60 %.

[2] The gas distribution plant index was constructed from various Handy-Whitman sub-indices. The construction of this index is discussed in greater detail in section VI of this testimony.

[3] PG&E and ORA proxy common plant escalation with the IHS Global Insight variable JPIFNRES (Chained Price Index – NonResidential Construction-Bureau of Economic Analysis). This variable is constructed by Bureau of Economic Analysis, United States Department of Commerce). Forecasts of this index are taken from IHS Global Insight – US Economic Outlook.

Table 5-1 compares ORA's and PG&E's forecasts of labor and non-labor escalation rates for 2015 through 2017:

Table 5-1
Comparison of ORA's and PG&E's Forecasts of
2015-2017 Labor and Non-Labor Annual Escalation Rates

Description	ORA Forecast			PG&E Proposed[4]		
	2015	2016	2017	2015	2016	2017
Labor	2.79 %	3.06 %	3.20 %	2.79 %	3.06 %	3.20 %
Non-Labor						
Electric Distribution	-0.75 %	0.00 %	1.89 %	-0.10 %	1.60 %	1.87 %
Nuclear Generation	-0.37 %	0.42 %	2.24 %	-0.20 %	1.90 %	2.26 %
Hydro Generation	-1.38 %	0.02 %	2.35 %	-1.10 %	2.02 %	2.58 %
Fossil Generation	-0.19 %	0.42 %	2.22 %	0.20 %	2.00 %	2.54 %
Gas Distribution	2.32 %	2.39 %	2.34 %	-0.70 %	2.11 %	2.56 %
A&G Electric	1.65 %	1.75 %	2.32 %	1.55 %	2.19 %	2.43 %
A&G Gas	1.61 %	1.53 %	2.05 %	1.56 %	1.92 %	2.26 %
A&G Weighted	1.64 %	1.68 %	2.23 %	1.55 %	2.10 %	2.43 %

[4] Ex. PG&E-12, p. 3-4.

Table 5-2 compares ORA's and PG&E's forecasts of labor and non-labor compounded escalation factors for 2015 through 2017:

Table 5-2
Comparison of ORA's and PG&E's Forecasts of
2015-2017 Labor and Non-Labor Compounded Escalation Factors
(2014 = 1.0000)

Description	ORA Forecast			PG&E Proposed		
	2015	2016	2017	2015	2016	2017
Labor	1.028	1.059	1.093	1.028	1.059	1.093
Non-Labor						
Electric Distribution	0.993	0.993	1.011	0.999	1.015	1.034
Nuclear Generation	0.996	1.001	1.023	0.993	1.017	1.040
Hydro Generation	0.986	0.986	1.010	0.989	1.009	1.035
Fossil Generation	0.998	1.002	1.025	1.002	1.022	1.048
Gas Distribution	1.042	1.067	1.092	0.993	1.014	1.040
A&G Electric	1.015	1.038	1.065	1.016	1.032	1.053
A&G Gas	1.016	1.032	1.053	1.016	1.035	1.058
A&G Weighted	1.016	1.033	1.057	1.016	1.037	1.062

Table 5-3 compares ORA's and PG&E's forecasts of annual capital-related escalation rates, while Table 5-4 compares ORA's and PG&E's forecasts of capital-related compounded escalation factors for 2015 through 2017:

Table 5-3
Comparison of ORA's and PG&E's 2015-2017
Forecasts of Annual Capital Related Escalation

Description	ORA Forecast			PG&E Proposed[5]		
	2015	2016	2017	2015	2016	2017
Electric Distribution	2.76 %	1.89 %	2.08 %	2.07 %	2.28 %	2.81 %
Nuclear Generation	1.98 %	1.14 %	1.90 %	1.80 %	2.46 %	2.57 %
Hydro Generation	1.73 %	1.82 %	2.40 %	1.52 %	2.43 %	2.57 %
Fossil Generation	1.80 %	1.10 %	1.99 %	1.89 %	2.48 %	2.50 %
Gas Distribution	2.76 %	1.81 %	1.75 %	1.58 %	2.17 %	2.42 %
Common Plant	3.96 %	1.57 %	1.47 %	2.52 %	2.54 %	2.40 %

Table 5-4
Comparison of ORA's and PG&E's Forecasts of
2015-2017 Compound Capital Escalation Factors
(2014 = 1.0000)

Description	ORA Forecast			PG&E Proposed		
	2015	2016	2017	2015	2016	2017
Electric Distribution	1.018	1.047	1.069	1.024	1.044	1.073
Nuclear Generation	1.020	1.031	1.051	1.018	1.043	1.070
Hydro Generation	1.017	1.036	1.061	1.015	1.040	1.067
Fossil Generation	1.018	1.029	1.050	1.019	1.044	1.070
Gas Distribution	1.028	1.046	1.064	1.016	1.038	1.063
Common Plant	1.040	1.056	1.071	1.025	1.051	1.076

[5] Ex. PG&E-12, p. 3-4.

IV. LABOR ESCALATION

A. PG&E Methodology

PG&E develops separate labor escalation rates for represented (union) and non-represented employees. PG&E explains that it: "monitors wage escalation in the market and increases its employees base pay annually as necessary through General Wage Increases (GWI) for represented employees and merit increases for non-represented employees."[6] Currently, PG&E has union contracts with the International Brotherhood of Electrical Workers (IBEW), Engineers and Scientists of California (ESC), and the Service Employees International Union (SEIU). The IBEW contract covers both physical and clerical employees. Table 5-5 summarizes PG&E's recommended labor escalation by employee category for the 2015 – 2017 forecast period.

Table 5-5
PG&E Labor Escalation Rates By Employee Category[7]
(2015-2017)

Employee Category	2015	2016	2017
IBEW Clerical	2.75 %	3.00 %	3.25 %
IBEW Physical	2.75 %	3.00 %	3.25 %
ESC	2.75 %	3.00 %	3.25 %
SEIU	2.75 %	3.00 %	3.25 %
Non-Represented	3.00 %	3.14 %	3.14 %
Weighted Average All Employees[8]	**2.79 %**	**3.06 %**	**3.20 %**

This is a slight departure from the methodology PG&E has used in prior General Rate Cases (GRCs). In past GRCs, PG&E has linked wage increases to forecast data taken from the Global Insight Power Planner model. For example, for forecast periods when a labor contract was not known, PG&E would proxy union

[6] Ex. PG&E-8, September 1, 2015, p. 3-19.

[7] Ex. PG&E-19, February 22, 2016, p. 6.

[8] Ex. PG&E-19, Update Testimony, Section C, WP-19-80.

wage increases to a forecast of the Global Insight Index CEU442211008, Average Hourly Earnings, Electric Power Generation, Transmission, and Distribution workers. Scientific and technical worker wage increases were proxied with ECIPWPSTNS, Employment Cost Index for US Wages and Salaries, Private Professional, Scientific, and Technical Workers. Non represented workers such as Managers and Supervisors were proxied with ECIPWMBFNS, Employment Cost Index, US Wages and Salaries, Private Management, Business, and Financial workers.

B. ORA Methodology

ORA evaluated the reasonableness of PG&E's recommended labor escalation rates by comparing them to labor related escalation rates taken from the Global Insight Power Planner model. Table 5-6 shows forecasts of CEU4422110008, ECIPWPSTNS, and ECIPWMBFNS.

Table 5-6
Global Insight Power Planner
Labor Escalation Indices[9]
2015 – 2017

Description	Global Insight Variable	2015	2016	2017	Compound Growth 2015 - 2017
AHE Electric Power Generation, Transmission & Distribution	CEU442211008	3.20 %	2.60 %	3.00 %	9.06 %
ECI Professional, Scientific, and Technical	ECIPWPSTNS	2.40 %	2.20 %	3.10 %	7.90 %
ECI Management, Business and Financial	ECIWMBFNS	2.40 %	2.50 %	2.70 %	7.79 %

[9] IHS Global Insight Power Planner, 4th Quarter 2016.

The Global Insight Index CEU442211008 tracks average hourly earnings growth for electric utility generation, transmission, and distribution workers. Global Insight's forecast is similar to PG&E's recommended labor escalation rates for its unionized workforce. For TY 2017 PG&E is recommending a 3.25 % wage increase for its unionized workforce. This is very close to the Global Insight forecast of a 3.00 % wage increase for electric generation, transmission and distribution workers. On a compound basis PG&E projects a union wage increase of 9.27 %. Compounding the growth in CEU442211008 over the 2015 – 2017 period yields a growth rate of 9.06 %. On the basis of this comparison ORA concludes that PG&E's proposed wage increases for its unionized workforce is reasonable.

Comparing PG&E's proposed wage increases for its non-represented employees is not as straightforward. In determining wage increases for its non-represented employees PG&E explains that: "PG&E participates in and receives multiple surveys, which it uses to benchmark wage escalation in Northern California as well as the utility industry nationally."[10] Table 5-6 shows two forecasts of the ECI for Professional, Scientific, and Technical workers (ECIPWPSTNS), and for Management, Business, and Financial workers (ECIWMBFNS). The United States Bureau of Labor Statistics (BLS) explains that these indexes capture: "the change in employers' costs for wages, salaries, and 20 different benefits classed into six categories."[11] The ECI includes such benefits as paid leave – vacations, holidays, and sick leave, supplemental cash payments, insurance benefits, retirements and savings benefits, Social Security, Federal, and State Unemployment insurance, severance pay and payment into supplemental unemployment plans.[12] In other words, the methodology used by PG&E to determine non-represented wage

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[10] Ex. PG&E-8, September 1, 2015, p. 3-22.

[11] Ruser, J.W., "The Employment Cost Index: What is it?" Monthly Labor Review, September, 2001, p.4.

[12] Id.

increases may not match directly to the BLS methodology used to construct the ECI's. Furthermore, PG&E's methodology focuses on local labor market conditions while the ECI's represent national trends in labor compensation.[13]

Despite any potential methodological differences, the ECI's wage growth rates reported in Table 5-6 are close to the wage increases PG&E proposes for its non-represented employees. For TY 2017 PG&E proposes to increase non-represented wages by 3.14 %. Global Insight forecasts that wages for Professional, Technical, and Scientific workers (ECIPWPSTNS) will increase by 3.10 %. For Management, Business, and Financial workers (ECIWMBFNS) Global Insight forecasts a growth of 2.70 %. Compounding PG&E's annual non-represented employee wage increases yields a compound test year growth rate of 9.57 %. Compounding the annual forecast growth rates for ECIPWPSTNS yields a 2015 – 2017 compound growth rate of 7.90 %. Compounding the annual growth rates for ECIWMBFNS yields a 2015 – 2017 compound growth rate of 7.79 %. Based on these comparisons, ORA concludes that PG&E's proposed wage increases for its non-represented employees are reasonable.

V. NON-LABOR ESCALATION

A. PG&E Methodology

PG&E's historic and forecast non-labor escalation rates are based on indexes taken from the IHS Global Insight Power Planner. The indexes in the Global Insight Power Planner follow the Federal Energy Regulatory Commission (FERC) Uniform System of Accounts. Table 5-7 shows the functional expense categories and the Global Insight Power Planner index associated with each functional category.

[13] Unlike the Consumer Price Index (CPI), ECI's are not available on a city or regional basis.

Table 5-7
Pacific Gas and Electric O&M Expense Categories and
Global Insight Power Planner Indexes

O&M Expense Category	Global Insight Power Planner Index
Electric Distribution	JEDOMMS
Nuclear Steam Generation	JENOMMS
Hydro Generation	JEHOMMS
Fossil Steam Generation	JEFOMMS
Gas Distribution	JGDOMMS
Admin and General – Electric	JEADGOMMSH
Admin and General – Gas	JGADOMMSH

With the exception of the A&G categories, JEADGOMMSH and JGADOMMSH, the indexes reported in Table 5-7 were taken directly from the Global Insight Power Planner. PG&E's forecasts were taken from the Global Insight Power Planner – 4th quarter 2014 forecast while ORA's forecasts are taken from the more recent Global Insight Power Planner- Fourth Quarter 2015.

The A&G indexes used by PG&E have been adjusted to account for the impact of health care escalation. PG&E explains that: "To avoid the double-counting of healthcare cost escalation, the effect of healthcare cost increases is excluded from the administrative non-labor escalation rates shown in this chapter. This was done by requesting adjusted A&G non-labor escalation rates from the IHS Global Insight UCIS service that excludes the effect of healthcare cost escalation."[14]

B. ORA Non-Labor Methodology

ORA relied upon the same non-labor escalation methodology as did PG&E. ORA's non-labor escalation rates, however, are based on a more recent Global Insight forecast. ORA relied upon non-labor escalation rates by functional category

[14] Ex. PG&E-12, September 1, 2015, p. 3-3.

based information taken from the Global Insight Power Planner – Fourth Quarter 2015.[15]

VI. CAPITAL ESCALATION

A. PG&E Methodology

PG&E developed capital-related escalation rates for Electric Distribution, Nuclear Generation, Hydro Generation, Fossil Fuel Generation, Gas Distribution and Common Plant. With the exception of Gas Distribution and Common Plant these indices were taken directly from the IHS Global Insight Power Planner. The Gas Distribution Plant index was constructed from a series of Gas Distribution sub-indices. Specifically, the Gas Distribution plant index is a weighted average of Plastic Gas Distribution Mains, Gas Distribution Compressor Station Equipment, Gas Distribution Services – Meters, and Gas Distribution House Regulators. These gas distribution-related capital indices were taken directly from the IHS Global Insight Power Planner.[16] The common plant index is proxied with the Global Insight variable JPIFNRES- Chained Price Index – Non-Residential construction.[17]

B. ORA Methodology

ORA's forecasts of capital-related escalation rates mirror PG&E's methodology. The differences between ORA and PG&E reflect ORA's use of a more recent Global Insight Power Planner forecast. Specifically, ORA relied upon the Global Insight Power Planner forecast – Fourth Quarter 2015 while PG&E relied upon the Global Insight forecast – Fourth Quarter 2014.

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[15] In response to ORA data request ORA_008_Q01 PG&E provided ORA with detailed spreadsheets showing how health care costs were removed the non-labor A&G indexes. ORA relied upon these spreadsheets to update the A&G indexes with data taken from the 4th Quarter 2015 IHS Global Insight Power Planner forecast.

[16] The exact Global Insight variable names are shown in PG&E cost escalation workpapers on page 3-4. Ex. PG&E-12, September 1, 2015, p. WP 3-4.

[17] Forecasts of this variable are taken from IHS Economics, US Economic Outlook.

VII. WITNESS QUALIFICATIONS

My name is Thomas M. Renaghan. My business address is 505 Van Ness Avenue, San Francisco, California. I am employed by the California Public Utilities Commission as a Public Utilities Regulatory Analyst V in the Office of Ratepayer Advocates Energy Cost of Service and Natural Gas Branch.

I received a Bachelor of Arts Degree in Economics from California State University, Hayward and a Ph.D. in Economics from the University of California, Davis.

Since joining the Commission in January 1984, my experience has primarily been in the areas of labor and non-labor escalation, energy demand forecasting, and in the measurement of total factor productivity for electric, gas and telecommunications firms.

This completes my prepared testimony.