

Docket	:	<u>A.17-11-009</u>
Exhibit Number	:	<u>ORA-08-SA</u>
Commissioner	:	<u>C. Rechtschaffen</u>
ALJ	:	<u>S. Roscow</u>
Witness	:	<u>G. Ezekwo</u>



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

**The Office of Ratepayer Advocates'  
Report on  
Pacific Gas and Electric Company's  
Cost of Service and Rates for Gas  
Transmission and Storage  
Services for the Period 2019 - 2021**

**Chapter 8: Corrosion Control**

**ORA SUPPORTING ATTACHMENTS**

San Francisco, California  
June 29, 2018

### ORA Supporting Attachments

<b>Page</b>	<b>Document</b>
1	GTS-RateCase2019_DR_ORA_035_Q01AtchRev01
5	GTS-RateCase2019_ORA_Oral002_Q01Atch01
7	GTS-RateCase2019_ORA_Oral002_Q02Atch01

ORA's supporting attachments include excerpts from the GTS-RateCase2019\_DR\_ORA\_035-Q01Atch01Rev01\_Redacted file. However, ORA notes that the header is listed as GTS-RateCase2019\_DR\_ORA\_035-Q01Atch01Rev01CONF. ORA has reviewed the file and confirmed that PG&E has redacted its confidential information.

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**From:** GTS Rate Case 2019 [<mailto:GTSRateCase2019@pge.com>]  
**Sent:** Tuesday, June 26, 2018 11:03 AM  
**To:** Li, Pui-Wa  
**Cc:** Obiora, Noel; Skinner, Nathaniel; Carruthers, John  
**Subject:** RE: Validation of Redacted vs. Confidential Materials

Pui-Wa,

Thank you for your message.

We recommend that ORA use the public redacted version of the DR #35 attachment that PG&E sent to ORA on May 18<sup>th</sup>. For your reference, that file was named "GTS-RateCase2019\_DR\_ORA\_035-Q01Atch01Rev01\_Redacted." Please also note that the public redacted file sent on May 18<sup>th</sup> was a revision to the original attachment – the file attached to your note below appears to be related to the original attachment.

Please let us know if you have any questions.

Thanks,

Tom Varghese for the 2019 GT&S Case Management Team  
Pacific Gas and Electric Company

<b>Row Labels</b>	<b>Sum of 2017 Recorded</b>
<b>5</b>	
Class Location Changes	542,979
Direct Assessment	30,908,380
Earthquake Fault Crossings	981,689
Emergency Response	3,936,820
Geo-Hazard	2,676,407
Hydrostatic Testing	102,630,932
In-Line Inspection	70,377,292
Other Transmission Asset Family Expense	604,488
Pipe Investigations and Field Engineering	5,246,129
Pipe Replacements	8,638,450
Programs to Support IM	13,810,593
Shallow/Exposed Pipe (incl. Water and Levee)	2,535,821
WRO	76,213
<b>5 Total</b>	<b>242,966,193</b>
<b>6</b>	
WELL- Integrity Assessments (Surveys)	2,590,083
WELL- Other	1,273,734
WELL- Reworks Integrity Assessments	3,091,617
<b>6 Total</b>	<b>6,955,434</b>
<b>7</b>	
Critical Documents	(1,697,525)
Engineering Critical Assessment Phase 1	7,718,202
Engineering Critical Assessment Phase 2	198,240
FIMP Risk Management	1,802,469
Gas Quality Assessment	430,318
Routine Spend C&P Expense	9,154,745
Routine Spend M&C Expense	3,037,193
Station OPP Enhancements Expense	443,823
<b>7 Total</b>	<b>21,087,465</b>
<b>8</b>	
AC Interference	701,578
Casings	3,558,592
Cathodic Protection	2,220,577
Close Interval Survey	1,011,072
Corrosion Support	2,263,115
DC Interference	959,977
Internal Corrosion	668,029
Routine Corrosion Maintenance	1,442,822
Stan-Pac Expense	44,752
Test Stations	2,595
Atmospheric Corrosion	1,148,026
<b>8 Total</b>	<b>14,021,134</b>
<b>9</b>	
Leak Management	6,324,192
Locate and Mark	9,579,012
Pipeline Maintenance	9,524,172
Pipeline Patrol	4,784,660
Right of Way	7,724,696
Stanpac Expense	122,865
Station Maintenance	15,214,110
<b>9 Total</b>	<b>53,273,707</b>
<b>10</b>	

Electric Fuel for Gas Compressors	19,507,975
Gill Ranch Operations & Maint	2,089,528
GT&S Marketing/Sales/Strategy	5,225,038
GT&S Operations	12,723,446
Uprates	2,191,729
<b>10 Total</b>	<b>41,737,717</b>
<b>12</b>	
ASvcs: Development	7,999,036
ASvcs: Maintain/Support	2,427,183
Corporate Security	3,675,940
Gas R&D and Deployment	1,662,369
Infrastructure and Operations	168,199
ISvcs: Critical Cyber Assets	220,139
ISvcs: JVS Misc Expendables	101,657
ISvcs: SCADA	259,515
<b>12 Total</b>	<b>16,514,037</b>
<b>13</b>	
Administrative and General (A&G) Expenses	8,074,637
Customer Access Charge	1,433,225
Environmental Operations	8,440,369
Gas Transmission - Aviation	172,583
Gas Transmission - Qualifications	1,035,477
Gas Transmission Mapping	7,903,819
Gas Transmission Training	3,385,284
Operational Management	5,727,607
Operational Support	12,632,930
Permits and Fees	10,200,236
Support	91,887,274
<b>13 Total</b>	<b>150,893,441</b>
<b>Grand Total</b>	<b>547,449,129</b>

Row Labels	Sum of 2017 Recorded
<b>5</b>	
Class Location Changes	11,477,724
Direct Assessment	2,261,665
Earthquake Fault Crossings	1,024,346
Emergency Response	80,932,833
Gas Gathering	5,276,621
Geo-Hazard	4,694,735
Hydrostatic Testing	77,604,286
In-Line Inspection	73,462,635
Other Transmission Asset Family Capital	(61,470)
Pipe Replacements	117,676,711
Shallow/Exposed Pipe (incl. Water and Levee)	14,767,955
WRO	18,994,874
<b>5 Total</b>	<b>408,112,915</b>
<b>6</b>	
WELL - Controls and Cont. Monitoring	110,566
WELL - Repair and Replace	1,988,908
WELL - Reworks	24,525,361
<b>6 Total</b>	<b>26,624,835</b>
<b>7</b>	
Becker System Upgrades	2,412,405
Compressor Replacement	22,997,332
Compressor Retrofit Projects	(18,409)
Compressor Unit Control Replacement	107,885
Emergency Shutdown Systems Upgrade	4,467,516
Engineering Critical Assessment Phase 2	(159,727)
GT Electrical Upgrades - Hinkley and Topock Compression Stations	(19,428)
Install Active Fire Suppression Systems	406,907
Perform Complex Station Rebuilds	34,953,375
Perform Simple Station Rebuilds	1,854,313
Perform Transmission Terminal Upgrades	1,249,758
Physical Security Capital	6,852,730
Replace Obsolete Bristol Controllers	(204,689)
Routine Spend C&P Capital	40,350,908
Routine Spend M&C Capital	23,252,183
Station Over Pressure Protection (OPP) Enhancements	413,267
Station Reliability Other	462
Upgrade Station Control	825,032
<b>7 Total</b>	<b>139,741,820</b>
<b>8</b>	
AC Interference	19,677,281
Atmospheric Corrosion	(393,306)
Casings	(1,590,873)
Cathodic Protection	11,009,028
DC Interference	2,472,964
Internal Corrosion	7,838
Test Stations	6,537,777
<b>8 Total</b>	<b>37,720,709</b>
<b>10</b>	
Capacity Betterment	8,758
Capacity for Load Growth	21,109,696
Capacity for Load Growth (Line 407)	86,870,562
Capacity to Support NOP Reductions	4,852

Gill Ranch Capital	149,830
GT SCADA Visibility	723,902
Large Meter Sets	38,078
New Business	937,914
<b>10 Total</b>	<b>109,843,593</b>
<b>12</b>	
ASvcs: Development	17,188,643
IT Other	127,376
<b>12 Total</b>	<b>17,316,019</b>
<b>13</b>	
Building Management Expenditures	19,396,934
Environmental Projects	(1,276,416)
Tools and Equipment	1,952,468
<b>13 Total</b>	<b>20,072,987</b>
<b>Grand Total</b>	<b>759,432,877</b>

Program	2015 Actual (NC 2015)	Authorized (N 2016)	Actual (NC 2016)	Authorized (N 2017)	Actual (NC 2017)	Authorized
Stampac	\$ 92,638	\$ 679,580	\$ 673,418	\$ 696,826	\$ 44,752	\$ 733,945
Corrosion - Unassigned	\$ 2,290	\$ -	\$ 485,853	\$ -	\$ -	\$ -
AC Interference	\$ 750,149	\$ 482,735	\$ 654,484	\$ 494,986	\$ 588,459	\$ 521,353
AC Interference - Shareholder	\$ 994,781	\$ -	\$ 877,097	\$ -	\$ 787,433	\$ -
Atmospheric Corrosion	\$ 1,163,246	\$ 16,147,135	\$ 3,722,281	\$ 16,556,914	\$ 1,148,026	\$ 17,438,877
Atmospheric Corrosion - Shareholder	\$ 17,730,786	\$ -	\$ 8,747,267	\$ -	\$ 3,070,405	\$ -
Cathodic Protection	\$ 728,847	\$ -	\$ 1,487,658	\$ -	\$ 2,220,577	\$ -
Test Stations	\$ 215,645	\$ -	\$ 3,546,293	\$ -	\$ 2,595	\$ -
Close Interval Survey	\$ 1,428,334	\$ 8,411,088	\$ 1,782,026	\$ 8,624,544	\$ 1,124,191	\$ 9,083,960
DC Interference	\$ 867,614	\$ 2,367,562	\$ 654,212	\$ 2,427,645	\$ 959,977	\$ 2,556,963
Internal Corrosion	\$ 1,789,357	\$ 7,890,095	\$ 1,833,883	\$ 8,090,329	\$ 668,029	\$ 8,521,289
Corrosion Support - Investigations	\$ 580,027	\$ 5,953,651	\$ 1,614,669	\$ 6,104,742	\$ 1,006,847	\$ 6,429,932
Corrosion Support - Investigations - Shareholder	\$ 874,914	\$ -	\$ 2,684,217	\$ -	\$ 1,740,377	\$ -
Corrosion Support	\$ 2,568,138	\$ -	\$ 2,192,097	\$ -	\$ 1,256,268	\$ -
Corrosion Support	\$ 1,803,551	\$ -	\$ (197,376)	\$ -	\$ -	\$ -
Testing Casings Without Leads	\$ 652,135	\$ -	\$ 829,041	\$ -	\$ 229,470	\$ -
Casings	\$ 15,212,115	\$ 37,185,772	\$ 3,778,506	\$ 38,129,467	\$ 3,329,122	\$ 40,160,568
Casings - Disallowed Expense	\$ -	\$ -	\$ 3,683,991	\$ -	\$ 1,648,906	\$ -
Rectifier Maintenance	\$ 140,368	\$ 221,204	\$ 196,879	\$ 226,818	\$ 137,069	\$ 238,900
CP Monitoring	\$ 571,164	\$ 892,738	\$ 698,018	\$ 915,394	\$ 689,000	\$ 964,156
Troubleshooting	\$ 338,581	\$ 88,494	\$ 515,400	\$ 90,739	\$ 337,517	\$ 95,573
Resurvey	\$ 17,652	\$ 85,465	\$ 2,142	\$ 87,634	\$ -	\$ 92,302
Corrective Maintenance	\$ 264,606	\$ 681,450	\$ 294,289	\$ 698,744	\$ 279,237	\$ 735,965
Atmospheric Corrosion Inspections	\$ 16,228	\$ -	\$ 6,527	\$ -	\$ -	\$ -
<b>Total Actual and Authorized (NCM) - Excludes Shareholder and Disallowed</b>	\$ 29,202,684	\$ 81,086,969	\$ 24,770,299	\$ 83,144,782	\$ 14,021,136	\$ 87,573,782
<b>Total Shareholder and Disallowed</b>	\$ 19,600,481	\$ -	\$ 15,992,572	\$ -	\$ 7,247,121	\$ -
<b>Total Corrosion Program Expense Spend (NCM)</b>	\$ 48,803,166	\$ -	\$ 40,762,871	\$ -	\$ 21,268,257	\$ -



Program	2015 Actual (NCI)	2015 Authorized (NCM)	2016 Actual (NCM)	2016 Authorized (NCM)	2017 Actual (NCM)	2017 Authorized (NCM)
Internal Corrosion	\$ 34,681	\$ 535,000	\$ 698,505	\$ 547,305	\$ 6,649	\$ 561,535
AC Interference	\$ 4,182,738	\$ 9,937,187	\$ 1,777,936	\$ 10,165,742	\$ 19,677,281	\$ 10,430,051
Casings	\$ 34,974,861	\$ 16,913,121	\$ 13,544,527	\$ 17,302,123	\$ (1,590,569)	\$ 17,751,978
Casings - Disallowed Capital	\$ -	\$ -	\$ 10,701,436	\$ -	\$ (343,396)	\$ -
Cathodic Protection	\$ 2,344,615	\$ 3,177,636	\$ 4,952,213	\$ 8,457,555	\$ 4,634,737	\$ 8,677,452
Cathodic Protection	\$ 2,084,837	\$ 8,267,405	\$ 6,339,338	\$ 3,250,721	\$ 6,364,663	\$ 3,335,240
Test Stations	\$ 2,554,120	\$ 1,194,017	\$ 6,807,449	\$ 1,221,480	\$ 6,537,777	\$ 1,253,238
DC Interference	\$ 713,101	\$ 727,160	\$ 1,182,962	\$ 743,884	\$ 2,472,964	\$ 763,225
Atmospheric Corrosion	\$ 16,697	\$ -	\$ 615,158	\$ -	\$ (393,306)	\$ -
Stanpac	\$ 210,957	\$ 178,682	\$ -	\$ 182,792	\$ -	\$ 187,545
Corrosion - Unassigned	\$ -	\$ -	\$ -	\$ -	\$ 10,513	\$ -
<b>Total Actual and Authorized (NCM) - Excludes Shareholder and Disallowed</b>	<b>\$ 47,116,607</b>	<b>\$ 40,930,208</b>	<b>\$ 35,918,088</b>	<b>\$ 41,871,602</b>	<b>\$ 37,720,709</b>	<b>\$ 42,960,264</b>
<b>Total Shareholder and Disallowed (NCM)</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 10,701,436</b>	<b>\$ -</b>	<b>\$ (343,396)</b>	<b>\$ -</b>
<b>Total Corrosion Program Capital Spend</b>	<b>\$ 47,116,607</b>	<b>\$ 40,930,208</b>	<b>\$ 46,619,524</b>	<b>\$ 41,871,602</b>	<b>\$ 37,377,313</b>	<b>\$ 42,960,264</b>

**PACIFIC GAS AND ELECTRIC COMPANY**  
**Gas Transmission and Storage Rate Case 2019**  
**A.17-11-009**  
**Data Response**

PG&E Data Request No.:	ORA_Oral002-Q02		
PG&E File Name:	GTS-RateCase2019_DR_ORA_Oral002-Q02		
Request Date:	March 14, 2018	Requester DR No.:	002 (meeting)
Date Sent:	March 30, 2018	Requesting Party:	ORA
PG&E Witness:	David McQuilling	Requester:	Godson Ezekwo

**QUESTION 2**

Please detail how PG&E used the various escalation rates to derive the 2019 forecast for Corrosion Control programs.

**ANSWER 2**

***PG&E notes that attachment “GTS-RateCase2019\_DR\_ORA\_Oral002Atch015” contains one or more of the following: critical infrastructure information that is not normally provided to the general public, the dissemination of which poses public safety risks (pursuant to the Critical Infrastructures Information Act of 2002, 6 U.S.C. §§131-134); sensitive personal information pertaining to PG&E employees; customer information; or commercially sensitive/proprietary information. This information has been redacted in the referenced attachment(s).***

Where possible, PG&E forecast its Corrosion Control programs by determining an average unit cost and applying that cost to the units in its program forecast. We examined costs generally from 2012-2017 and applied escalation factors to historical costs to account for inflation. The table below shows the escalation factors PG&E used for most of the Corrosion Control capital and expense work. <sup>1</sup>

<b>Year</b>	<b>Capital</b>	<b>Expense</b>
2011	5.217%	3.888%
2012	5.383%	1.907%
2013	-.418%	1.808%
2014	5.708%	1.998%
2015	-.805%	0.184%
2016	-.311%	0.943%
2017	3.486%	2.337%
2018	2.358%	2.086%
2019	2.757%	2.359%
2020	3.142%	2.492%
2021	2.943%	2.420%

<sup>1</sup> Where a different date range or a different forecasting methodology is used, it is noted in Chapter 8 Testimony.

Attachments GTS-RateCase2019\_DR\_ORA\_Oral002\_Q02Atch02 through GTS-RateCase2019\_DR\_ORA\_Oral002\_Q02Atch17 show how PG&E identified historical orders associated with Corrosion Control programs, converted costs recorded on those orders to the New Cost Model (NCM), and escalated NCM costs to 2017 dollars. The Workpapers Supporting Chapter 8 Corrosion Control show how PG&E escalated costs from 2017 to the Rate Case Period.<sup>2</sup>

In gathering these materials, PG&E noted an error in Workpapers related to AC Interference. The error, which appears on WP p. 8-90 and 8-91, double-counted the cost of one project and, therefore, doubled the unit cost of Zinc Ribbon installations. PG&E will correct this in a future errata filing.

### Index of Attachments

Attachment	Description
GTS-RateCase2019_DR_ORA_Oral002_Q02Atch02	Historical order conversion concerning AC Interference – Capital (3K4)
GTS-RateCase2019_DR_ORA_Oral002_Q02Atch03	Historical order conversion concerning AC Interference – Expense (GJA)
GTS-RateCase2019_DR_ORA_Oral002_Q02Atch04	Historical order conversion concerning Atmospheric Corrosion – Capital (3KA)
GTS-RateCase2019_DR_ORA_Oral002_Q02Atch05	Historical order conversion concerning Atmospheric Corrosion – Expense (GJB)
GTS-RateCase2019_DR_ORA_Oral002_Q02Atch06	Historical order conversion concerning Casings – Capital (3K5)
GTS-RateCase2019_DR_ORA_Oral002_Q02Atch07	Historical order conversion concerning Casings – Expense (GJM)
GTS-RateCase2019_DR_ORA_Oral002_Q02Atch08	Historical order conversion concerning Cathodic Protection – Capital (3K6, 3K7)
GTS-RateCase2019_DR_ORA_Oral002_Q02Atch09	Historical order conversion concerning Cathodic Protection – Expense (GJC)
GTS-RateCase2019_DR_ORA_Oral002_Q02Atch10	Historical order conversion concerning Close Interval Survey – Expense (GJE)
GTS-RateCase2019_DR_ORA_Oral002_Q02Atch11	Historical order conversion concerning Corrosion Support – Expense (GJK)
GTS-RateCase2019_DR_ORA_Oral002_Q02Atch12	Historical order conversion concerning DC Interference – Capital (3K9)

<sup>2</sup> Note that the Workpapers Supporting Chapter 8 present escalation rates as numeric multipliers rather than percentages. For example, the Workpapers show a 2% escalation as 1.02.

GTS-RateCase2019_DR_ORA_Oral002_Q02Atch13	Historical order conversion concerning DC Interference – Expense (GJF)
GTS-RateCase2019_DR_ORA_Oral002_Q02Atch14	Historical order conversion concerning Internal Corrosion – Expense (GJH)
GTS-RateCase2019_DR_ORA_Oral002_Q02Atch15	Historical order conversion concerning Atmospheric Corrosion Inspections – Expense (JOZ)
GTS-RateCase2019_DR_ORA_Oral002_Q02Atch16	Historical order conversion concerning Test Stations – Capital (3K8)
GTS-RateCase2019_DR_ORA_Oral002_Q02Atch17	Historical order conversion concerning Test Stations – Expense (GJD)