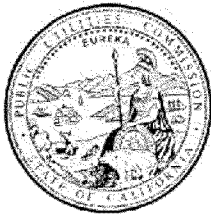


Docket:	:	<u>A.13-12-012</u>
Exhibit Number	:	<u>ORA-07</u>
Commissioner	:	<u>C. Peterman</u>
ALJ	:	<u>J. Wong</u>
Witness	:	<u>M. Karle</u>



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

**Report on the Results of Operations  
for  
Pacific Gas and Electric Company  
Test Year 2015  
Gas Transmission and Storage Rate Case**

Chapter 7  
Corrosion Control

San Francisco, California  
August 11, 2014

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# CORROSION CONTROL

## 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) corrosion control proposals associated with its Test Year (TY) 2015 Gas Transmission and Storage (GT&S) rate case. Specifically, this exhibit addresses PG&E's forecasts of corrosion control expenses for TY 2015 and capital expenditures for 2015.

## II. SUMMARY OF RECOMMENDATIONS

The largest portion of PG&E's forecast for corrosion control relates to the Company's proposed program to mitigate contacted casings. ORA's recommendations regarding this program are:

- A 2015 cost cap of \$4,895,618 for expense mitigation of contacted casings, because this work appears to be deferred maintenance intended to meet longstanding federal regulations. PG&E has forecast \$48,503,848 for expense mitigation of contacted casings in 2015. ORA's proposed cost cap is equal to PG&E's 2013 spending on expense casing mitigation with additional funding for the six additional expense casings PG&E expects to find and mitigate in 2015.
- A 2015 cost cap of \$1,935,137 on capital expenditures for mitigation of contacted casings, which is equal to PG&E's 2013 capital expenditure on casing mitigation with additional funding for the 1.33 additional capitalized casings PG&E expects to find and mitigate in 2015. PG&E has requested recovery for \$21,083,693 in 2015 capital expenditures.

The following summarizes ORA's recommendations regarding the remainder of PG&E's 2015 corrosion control expense forecasts:

- \$2,024,231 for 2015 Direct Current (DC) interference mitigation which accounts for investigation and half of PG&E's mitigation forecast, and which excludes \$527,638 of PG&E's \$2,551,869 expense forecast for DC interference mitigation.
- \$16,143,948 in 2015 expenses for atmospheric corrosion, which accounts for investigation and half of PG&E's mitigation forecast, and which excludes \$4,293,098 of PG&E's \$20,437,046 forecast.

1 The following summarizes ORA's recommendations regarding the remainder  
2 of PG&E's 2015 corrosion control capital expenditure forecasts:

- 3 □ \$5,750,555 in capital expenditures for 2015 Alternating Current (AC)  
4 interference mitigation, which accounts for investigation and half of  
5 PG&E's mitigation forecast, and which excludes \$4,599,177 from PG&E's  
6 \$10,349,647 capital expenditure forecast.
- 7 □ \$400,893 in capital expenditure forecast for 2015 DC interference  
8 mitigation, which accounts for half of PG&E's mitigation forecast of  
9 \$801,786 and excludes \$400,893 of PG&E's forecast.

10 ORA's forecasts for the specific program areas in which ORA makes a  
11 recommendation herein are summarized below. Please note that the lack of a  
12 specific ORA disallowance or forecast in some program areas should not be taken to  
13 constitute agreement with PG&E's proposals.

14 Table 7-1 compares ORA's and PG&E's TY2015 forecasts of corrosion  
15 control expenses:

16 **Table 7-1**  
17 **Corrosion Control Expenses for TY 2015 (in dollars)**

Description	PG&E 2015	ORA 2015	Adjustments
Casings	48,503,848	4,895,618	(43,608,230)
Direct Current Interference	2,551,869	2,024,231	(527,638)
Atmospheric Corrosion Inspection and Mitigation	20,437,046	16,114,288	(4,322,757)
Total Corrosion Control Expense	71,492,762	23,034,137	(48,458,625)

18  
19 Table 7-2 compares ORA's and PG&E's 2015 forecast of corrosion control  
20 capital expenditures:

1  
2

**Table 7-2  
Corrosion Control Capital Expenditures for 2015 (in dollars)**

Order Description	PG&E 2015	ORA 2015	Adjustments
Interference Mit LTRAN	3,306,588	1,653,294	(1,653,294)
Interference Mit NPATH2	29,005	14,503	(14,503)
Interference Mit STOR	14,503	7,251	(7,251)
Interference Mit - L401	14,503	7,251	(7,251)
Interference Mit - NPATH	14,503	7,251	(7,251)
Interference Mit - SPATH	14,503	7,251	(7,251)
30847640 - L-3012-01 AC INTERFERENCE PIT	-	-	-
P.03556-Overall CP Interference program	-	-	-
30897928 - L-109&132 6 DECOUPLER INSTALL	-	-	-
P.03556-Overall CP Interference program	-	-	-
30896215-L-2 Mp114-119 &I-401 Mp347-353	-	-	-
30854607 - L-300A MP 239.6 SOCIAL INTERFE	-	-	-
Coupon Installation	1,151,320	1,151,320	-
L107 Induced AC Mit	160,500	80,250	(80,250)
L109 Induced AC Mit	53,500	26,750	(26,750)
L132 Induced AC Mit	53,500	26,750	(26,750)
L401 Induced AC Mit	5,537,250	2,768,625	(2,768,625)
Interference Mit - Other	-	-	-
30916749-L-132 AC MITIGATION	-	-	-
GSM, Cathodic Protection	-	-	-
<b>Total AC Interference Mitigation</b>	<b>10,349,674</b>	<b>5,750,497</b>	
Interference Mit - LTRAN	217,539	108,769	(108,769)
Interference Mit BALOP	101,518	50,759	(50,759)
Interference Mit L401	14,503	7,251	(7,251)
Interference Mit SPATHN	14,503	7,251	(7,251)
Interference Mit SPATHS	391,570	195,785	(195,785)
P.03616-Capitol BART interference Remmed	-	-	-
Interference Mit STNPC	62,154	31,077	(31,077)
GSM, Cathodic Protection	-	-	-
<b>Total DC Interference Mitigation</b>	<b>801,786</b>	<b>400,893</b>	
P.04393-CASING REMEDIATION CAP	-	-	-
P.02192-L-402 CASING ETS/VENT INSTALLATI	-	-	-
30841094 - TEST CASING	-	-	-
30841027 - TEST CASING KETTLEMAN	-	-	-
Casings - STOR	62,324	5,733	(56,591)
Casings - LTRAN	18,946,398	1,742,688	(17,203,710)
Casings - L401	373,942	34,395	(339,547)
Casings - NPATH	373,942	34,395	(339,547)
Casings - NPATHL2	62,324	5,733	(56,591)
Casings - NSPATH	124,647	11,465	(113,182)
Casings - SSPATH	124,647	11,465	(113,182)
Casings - BALOP	810,208	74,523	(735,685)
Casings - STNPC	160,261	14,741	(145,520)
GSM, Cathodic Protection	-	-	-
<b>Total Casings</b>	<b>21,038,693</b>	<b>1,935,137</b>	

3

1 **III. GENERAL OVERVIEW**

2 PG&E indicates that the Company did not previously have a formal corrosion  
3 control program, instead performing aspects of corrosion control work as a part of  
4 various other pipeline maintenance activities.<sup>1</sup> The Company claims to have initiated  
5 a process of moving towards industry best practices and of formalizing its previously  
6 decentralized corrosion control program in 2013.<sup>2</sup> PG&E is requesting substantial  
7 increases in funding for its expanded corrosion control program. However much of  
8 PG&E's capital and expense forecast appears to consist of deferred maintenance to  
9 be performed in order to bring PG&E's gas transmission facilities into compliance  
10 with longstanding federal regulations and industry best practices. Where this is the  
11 case, ORA recommends appropriate cost caps for ratepayers in order to ensure that  
12 shareholders bear some level of responsibility for costs associated with PG&E's  
13 deferral of necessary pipeline maintenance.

14 PG&E indicates that it could not provide authorized spending levels from the  
15 previous rate case period as established in Gas Accord V,<sup>3</sup> and in most cases PG&E  
16 could not provide any information on actual program spending prior to the year 2009.  
17 PG&E's expense forecasts for 2013 and 2014 were minimal, and ORA does not  
18 contest those forecasts herein.

19 **IV. DISCUSSION / ANALYSIS OF CASINGS**

20 The most substantial portion of PG&E's expense and capital expenditure  
21 forecasts for corrosion control consists of the Company's proposed program for  
22 mitigation of pipelines that have come into electrical contact with their casings. In the  
23 past casings were installed around pipelines at road, railroad, and other crossings;

---

<sup>1</sup> PG&E Prepared Testimony, Volume 1 (Peralta), p.7-5.

<sup>2</sup> PG&E Prepared Testimony, Volume 1 (Peralta), p.7-13.

<sup>3</sup> PG&E Response to TURN-DR-14 Q1.

1 however, casings have been phased out and are no longer installed as the case can  
2 come into electrical contact with the pipeline and cause corrosion.<sup>4</sup>

3 PG&E is forecasting \$48.5 million in expense to mitigate contacted casings in  
4 2015. The Company is forecasting \$21 million in capital expenditures for 2015,  
5 \$21.1 million for 2016, and \$13 million in 2017. The extent to which this forecast  
6 consists of incremental spending is unclear given PG&E's 2012 redesign of major  
7 work categories. ORA recommends a forecast of \$4,895,618 for 2015 expense and  
8 of \$1,935,137 in 2015 capital expenditure.

9 PG&E states that "historically, as PG&E identified contacted casings through  
10 annual testing a corrective action plan was created and casing mitigation was  
11 focused primarily on metallic contacts."<sup>5</sup> Federal Code of Regulations §192.467 (a)  
12 requires that pipelines be electrically isolated:

13 Each buried or submerged pipeline must be electrically isolated  
14 from other underground metallic structures, unless the pipeline and  
15 the other structures are electrically interconnected and cathodically  
16 protected as a single unit.

17 Federal Code of Regulations §192.467 (c) mandates that a pipeline in  
18 electrical contact with its casing requires mitigation:

19 Except for unprotected copper inserted in ferrous pipe, each  
20 pipeline must be electrically isolated from metallic casings that are  
21 a part of the underground system. However, if isolation is not  
22 achieved because it is impractical, other measures must be taken  
23 to minimize corrosion of the pipeline inside the casing.

24 The regulatory requirements of §192.467(c) were adopted in 1968 and have  
25 not been amended since 1978. PHMSA Interpretation #PI-86-004 dated July 24,  
26 1986 states the following regarding violations of Paragraph 192.467 (c) above:

27 A violation of Paragraph 192.467(c) exists if : A cathodically  
28 protected transmission or distribution pipeline, other than  
29 unprotected copper inserted into ferrous pipe, is electrically  
30 connected to metallic casings that are a part of the underground  
31 system and within six months of discovery of the electrical short

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<sup>4</sup> PG&E Prepared Testimony, Volume 1 (Peralta), p. 7-35.

<sup>5</sup> PG&E Prepared Testimony, Volume 1 (Peralta), p. 7-36.

1 between the casing and pipeline, the operator has not initiated  
2 corrective action.<sup>6</sup>

3 While PG&E claims to have “a robust program for monitoring casings,”<sup>7</sup> it has  
4 not employed a robust program of mitigation where contacted casings are identified.  
5 PHMSA regulations as cited above require that remediation of contacted casings be  
6 initiated within six months. PHMSA enforcement guidelines indicate that a probable  
7 violation of section 192.467 (c) exists if:

8 A cathodically protected transmission, distribution gas pipeline and  
9 hazardous liquid pipeline is electrically connected to metallic  
10 casings that are a part of the underground system, and within six  
11 months of discovery of the electrical short between the casings and  
12 pipeline, the operator has not initiated corrective action.<sup>8</sup>

13 In response to discovery PG&E produced a list of currently unmitigated  
14 casing contacts and the year in which those contacts were identified.<sup>9</sup> This list is  
15 summarized in Table 7-3.

16 **Table 7-3**  
17 **Contacted Casings Identified but not Mitigated**  
18 **as of March 2014 (by Year Identified)**

Year	Identified
2006	8
2007	2
2008	24
2009	20
2010	30
2011	34
2012	97
2013	120
Total	335

19 Source: PG&E Response to IP-DR-2 Q119a.  
20

<sup>6</sup> PHMSA Interpretation #PI-86-004, July 24, 1986.

<sup>7</sup> PG&E Prepared Testimony, Volume 1 (Peralta), p. 7-37.

<sup>8</sup> Part 192 Corrosion Enforcement Guidance, p. 78.  
[http://www.phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/Pipeline/Corrosion\\_Enforcement\\_Guidance\\_Pt192\\_012213.pdf](http://www.phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/Pipeline/Corrosion_Enforcement_Guidance_Pt192_012213.pdf) (accessed August 8, 2014).

<sup>9</sup> PG&E Response to IP-DR-2 Q119a.



1 It should be noted that the number of identified contacted casings in the table  
2 above represent outstanding contacts, rather than the total identified by year. For  
3 example, the 8 contacts listed for the year 2006 had not been corrected as of March  
4 28, 2014, the date on which PG&E provided the information. In the period between  
5 2008 and 2011, there were between 20 and 34 contacts *per year* identified by the  
6 Company which remain unaddressed. In 2012 the number increases substantially to  
7 97, and again in 2013 to 120.

8 According to the information provided by PG&E, the Company was aware of a  
9 total of 335 unmitigated contacted casings as of 2013. Given that it is now more than  
10 six months into 2014, every one of these 335 contacted casings appears to be out of  
11 compliance with the federal requirement in §192.467 (c) that remediation be initiated  
12 within six months of the Company becoming aware of a contacted casing. These  
13 regulatory requirements are longstanding, having been in place in current form for  
14 nearly 40 years. PG&E has been aware of many contacted cases for years and has  
15 not undertaken mitigation efforts.

16 PG&E states in its testimony that an aggressive casing mitigation program is  
17 required starting in 2014 given the magnitude of the potential risk of corrosion  
18 relating to contacted casings. The Company states that “this 4-year mitigation pace  
19 is appropriate to address the risk because contacted casings could be experiencing  
20 unmitigated active external corrosion which compromises pipeline integrity.”<sup>10</sup>  
21 PG&E’s statements in this rate case notwithstanding, its history of mitigating  
22 identified contacted casings indicates that mitigation of such casings in accordance  
23 with PHMSA regulations has not been prioritized. Table 7-4 shows the total number  
24 of contacted casings mitigated by PG&E by year from 2004-2013.<sup>11</sup>

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<sup>10</sup> PG&E Prepared Testimony, Volume 1 (Peralta), p. 7-36.

<sup>11</sup> PG&E Response to TURN-DR-14 Q4.

1  
2

**Table 7-4**  
**Contacted Casings Mitigated by Year**

Year	Mitigated
2004	3
2005	3
2006	5
2007	1
2008	1
2009	1
2010	1
2011	2
2012	4
2013	9
Total	30

3  
4

Source: PG&E Response to TURN-DR-14 Q4.

5 PG&E has mitigated only 30 contacted casings in the past 10 years, with 9 of  
6 those mitigations happening in 2013, the most recent year for which data was  
7 available. PG&E has mitigated an average of 3 contacts per year. In 2015 alone  
8 PG&E is proposing to mitigate 117 expense casings and 36 capital casings. PG&E  
9 has not been appropriately mitigating contacted casings as required by federal  
10 regulation, and this deferral of required maintenance is the reason for the significant  
11 increase in ratepayer funding being requested by PG&E in order to bring PG&E's  
12 pipeline assets into compliance.

13 Federal regulations require contacted cases to be mitigated. ORA expects  
14 that PG&E will carry out the mitigations on the schedule outlined in testimony, and  
15 recommends that company shareholders be responsible for costs above ORA's  
16 forecast. The recommendations included herein allow for ratepayer funding of the  
17 full amount PG&E has requested for ongoing mitigations of newly discovered  
18 contacted casings. The disallowance herein is applied to contacted casings which  
19 the company has been aware of for longer than the six months allowed by PHMSA  
20 regulations but for which no mitigation has been performed. Ratepayers should not  
21 bear the full cost of PG&E coming into compliance with federal regulations which  
22 have been in place for more than 40 years. PG&E's long term deferral of this  
23 necessary maintenance should not be rewarded with ratepayer funding for work that

1 the company has been aware needs to be done and that federal regulations required  
2 to be done.

3 The Commission has previously disallowed utility requests for ratepayer  
4 funding of work that can be shown to be deferred maintenance:

5 For us to authorize Edison's recovery of deferred maintenance  
6 expense would establish an undesirable precedent, whereby the  
7 utility is effectively guaranteed that it can earn (or exceed) its  
8 authorized rate of return, regardless of its operating efficiency or  
9 inefficiency, simply by curtailing current maintenance activities, in  
10 the assurance that they could be refinanced later through recovery  
11 of deferred maintenance expenses in a succeeding rate case. This  
12 would create a perverse incentive for the utility to defer needed  
13 maintenance in the future. Consequently, we will disallow recovery  
14 of the \$34.6 million requested for deferred maintenance activities in  
15 1983 and 1984. Our disallowance of this expense for test year  
16 ratemaking purposes does not relieve Edison of its responsibility to  
17 maintain the operating efficiency of its utility plant in a timely  
18 manner. Indeed, we expect Edison to fulfill that responsibility more  
19 conscientiously in the future.<sup>12</sup>

20 Given the severity of PG&E's deferral of maintenance of contacted casings,  
21 ORA recommends that the Commission adopt a cost cap on casing mitigations for  
22 expense and for capital respectively as described below. Given PG&E's negligence,  
23 ORA's recommendation represents a reasonable forecast of ratepayer funding in  
24 light of PG&E's substantial deferral of maintenance in this area.

25 The following tables summarize PG&E's request and ORA's recommendation  
26 for expense and capital expenditures related to casings for 2015:

---

<sup>12</sup> 10 CPUC 2<sup>nd</sup> 155, 186; D.82-12-055.

1  
2

**Table 7-5  
Casings Expenses for TY 2015 (in dollars)**

Order Description	PG&E 2015	ORA 2015	Adjustment
Casings - STOR	143,685	14,502	(129,182)
Casings - L401	862,108	87,015	(775,093)
Casings - NPATH	862,108	87,015	(775,093)
Casings - NPATHL2	143,685	14,502	(129,182)
Casings - NSPATH	287,369	29,005	(258,364)
Casings - SSPATH	287,369	29,005	(258,364)
Casings - BALOP	1,867,901	188,532	(1,679,369)
Casings - STNPC	369,475	37,292	(332,183)
Casings - LTRAN	43,680,147	4,408,750	(39,271,398)
HPG	-	0	-
<b>Casings Expense Total</b>	<b>48,503,848</b>	<b>4,895,618</b>	<b>(43,608,230)</b>

3

4  
5

**Table 7-6  
Casings Capital Expenditures for 2015 (in dollars)**

Order Description	PG&E 2015	ORA 2015	Adjustment
P.04393-CASING REMEDIATION CAP	-	-	-
P.02192-L-402 CASING ETS/VENT INSTALLATI	-	-	-
30841094 - TEST CASING	-	-	-
30841027 - TEST CASING KETTLEMAN	-	-	-
Casings - STOR	62,324	5,733	(56,591)
Casings - LTRAN	18,946,398	1,742,688	(17,203,710)
Casings - L401	373,942	34,395	(339,547)
Casings - NPATH	373,942	34,395	(339,547)
Casings - NPATHL2	62,324	5,733	(56,591)
Casings - NSPATH	124,647	11,465	(113,182)
Casings - SSPATH	124,647	11,465	(113,182)
Casings - BALOP	810,208	74,523	(735,685)
Casings - STNPC	160,261	14,741	(145,520)
GSM, Cathodic Protection	-	-	-
<b>Casings Capital Expenditure Total</b>	<b>21,038,693</b>	<b>1,935,137</b>	<b>(19,103,556)</b>

6

7

**A. Expenses**

8

ORA's recommendation for expense was developed by applying the utility's ratio of expense to capital projects of three to one<sup>13</sup> to the total number of casing mitigations performed in 2013. As there were 9 casing mitigations performed in

10

<sup>13</sup> PG&E Prepared Testimony, Volume 1 (Peralta), p. 7-37.

1 2013, using PG&E's three to one ratio, 6.75 of those mitigations would have been  
 2 expense. ORA then added 6 additional mitigations, to account for PG&E's  
 3 projection for additional expensed contacted casings to be identified on a yearly  
 4 basis. Thus ORA's recommendation fully funds future compliance with federal  
 5 regulations, while disallowing ratepayer funding over what PG&E spent in 2013 for  
 6 the portion of its request representing deferred maintenance.

7 As shown below in Table 7-7, this approach resulted in a forecast of 12.75  
 8 expense casing mitigations per year, which, multiplied by PG&E's forecast unit cost  
 9 (\$383,970), resulted in a total of \$4,895,618.

10 **Table 7-7**

Expense Unit Cost		
Unit cost	Units	Total
\$383,970	12.75	\$4,895,618

11  
 12 **B. Capital Expenditures**

13 ORA's recommendation for capital expenditures was developed in the same  
 14 manner as ORA's recommendation for expense: by applying the utility's ratio of  
 15 expense to capital projects (three to one) to the total number of casing mitigations  
 16 performed in 2013. As there were 9 casing mitigations performed in 2013, 2.25 of  
 17 those would represent capitalized mitigations. ORA then added 1.33 additional  
 18 mitigations to account for PG&E's projection of four additional capitalized contacted  
 19 casings to be identified over the three year rate cycle. This resulted in a forecast of  
 20 3.58 capitalized casing mitigations per year, which multiplied by PG&E's forecast  
 21 unit cost (\$540,451) results in a total of \$1,935,137.

22 **Table 7-8**

Capital Unit Cost		
Unit cost	Units	Total
\$540,541	3.58	\$1,935,137

23  
 24 **V. DISCUSSION / ANALYSIS OF AC INTERFERENCE**

25 Stray Alternating Current (AC) along a gas pipeline can cause or accelerate  
 26 external pipeline corrosion. PG&E states in testimony that the Company is in the

1 process of formalizing an AC mitigation program, and that “in the past, PG&E  
2 addressed AC interference issues on an as needed basis.”<sup>14</sup>

3 PG&E is forecasting \$527,500 in AC interference expense in 2015. The  
4 Company is forecasting \$10.3 million in capital expenditures for 2015, \$16.5 million  
5 for 2016, and \$15 million in 2017. The extent to which the forecast consists of  
6 incremental spending is unclear, given PG&E’s 2012 redesign of major work  
7 categories.<sup>15</sup> PG&E was unable to provide authorized spending levels from the  
8 previous rate case period as established in Gas Accord V,<sup>16</sup> but claims that it “has  
9 not previously asked for specific AC interference program funding in prior rate cases,  
10 however, this program work has been performed in an *ad hoc* manner.” PG&E  
11 reports having completed only one AC interference mitigation project in the period  
12 between 2005 and 2012, at a cost of \$362,424 for AC mitigation along 0.6 miles of  
13 transmission pipe.<sup>17</sup>

14 Federal regulations require that gas pipeline operators monitor for and  
15 mitigate stray currents. Volume 49, Code of Federal Regulations §192.473 states  
16 that:

17 (a) Each operator whose pipeline system is subjected to stray  
18 currents shall have in effect a continuing program to minimize the  
19 detrimental effects of such currents.  
20

21 (b) Each impressed current type cathodic protection system or  
22 galvanic anode system must be designed and installed so as to  
23 minimize any adverse effects on existing adjacent underground  
24 metallic structures.<sup>18</sup>

25 This section originated in 1968, and was last amended in 1978. PHMSA  
26 enforcement guidance lists two examples of probable violations of § 192.437(a); if  
27 “the operator does not have a written program to minimize the detrimental effects of  
28 stray currents,” or “if there are potential sources of interference, the operator did not

---

<sup>14</sup> PG&E Prepared Testimony, Volume 1 (Peralta), p.7-28.

<sup>15</sup> PG&E Prepared Testimony, Volume 1 (Peralta), p.7-15.

<sup>16</sup> PG&E Response to TURN-DR-14 Q1.

<sup>17</sup> PG&E Response to TURN-DR-14 Q6.

<sup>18</sup> 49 CFR 192 § 473 (2014).

1 perform testing or take mitigative actions in accordance with its program, as  
2 necessary.”<sup>19</sup>

3 While PG&E is currently formalizing an AC interference mitigation program,  
4 the company has not been performing work consistent with § 192.437(a) prior to the  
5 filing of this rate case. A May 2014 consultant’s report to PG&E states that “at  
6 present, PG&E does not have a written plan to identify, test for, and minimize the  
7 detrimental effects of stray currents per 49 CFR 192.437 (a) and PHMSA part 192  
8 Guidance.”<sup>20</sup> Thus, PG&E was aware that it was not performing work as required by  
9 federal regulations.

10 PG&E did not have a written plan to test for or mitigate stray currents and it  
11 appears that PG&E did not routinely perform mitigative action in instances where it  
12 became aware of stray currents. PG&E references in testimony a 2012 self-report  
13 saying as that it was aware of unprotected pipeline in proximity to electric  
14 transmission towers and at risk of AC coupling but had not taken action to mitigate  
15 the risk.<sup>21</sup> The Company states that it has initiated corrective work relating to the self-  
16 report and has not sought ratepayer funding for that work.<sup>22</sup>

17 However, PG&E is seeking ratepayer funding for other costs relating to  
18 bringing its gas transmission system into compliance with federal code. ORA’s  
19 position relating to corrosion control is that: 1) ratepayer funding relating to  
20 *investigation* of pipeline assets is appropriate, if properly justified; but 2) ratepayers  
21 should not be responsible for funding the entire cost of bringing PG&E’s system into  
22 compliance with federal codes that have been in effect for over 40 years.

23 The following table summarizes PG&E’s request and ORA’s recommendation  
24 relating to AC interference mitigation capital expenditures for 2015.

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<sup>19</sup> PHMSA Enforcement Guidance Part 192, p. 92;  
[http://www.phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/Pipeline/Corrosion\\_Enforcement\\_Guidance\\_Pt192\\_012213.pdf](http://www.phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/Pipeline/Corrosion_Enforcement_Guidance_Pt192_012213.pdf) (Accessed July 25, 2014).

<sup>20</sup> Exponent *PG&E Gas Transmission & Distribution Corrosion Program Health Assessment*, p. 42; provided in PG&E Response to ORA-DR-73 Q13.

<sup>21</sup> PG&E Prepared Testimony, Volume 1 (Peralta), p.7-28.

<sup>22</sup> *Id.*

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**Table 7-9  
AC Interference Capital Expenditures for 2015 (in dollars)**

Order Description	PG&E 2015	ORA 2015	Adjustment
Interference Mit LTRAN	3,306,588	1,653,294	(1,653,294)
Interference Mit NPATH2	29,005	14,503	(14,503)
Interference Mit STOR	14,503	7,251	(7,251)
Interference Mit - L401	14,503	7,251	(7,251)
Interference Mit - NPATH	14,503	7,251	(7,251)
Interference Mit - SPATH	14,503	7,251	(7,251)
30847640 - L-3012-01 AC INTERFERENCE PIT	-	-	-
P.03556-Overall CP Interference program	-	-	-
30897928 - L-109&132 6 DECOUPLER INSTALL	-	-	-
P.03556-Overall CP Interference program	-	-	-
30896215-L-2 Mp114-119 &I-401 Mp347-353	-	-	-
30854607 - L-300A MP 239.6 SOCIAL INTERFERE	-	-	-
Coupon Installation	1,151,320	1,151,320	-
L107 Induced AC Mit	160,500	80,250	(80,250)
L109 Induced AC Mit	53,500	26,750	(26,750)
L132 Induced AC Mit	53,500	26,750	(26,750)
L401 Induced AC Mit	5,537,250	2,768,625	(2,768,625)
Interference Mit - Other	-	-	-
30916749-L-132 AC MITIGATION	-	-	-
GSM, Cathodic Protection	-	-	-
<b>Alternating Current Capital Expenditure Total</b>	<b>10,349,674</b>	<b>5,750,497</b>	<b>(4,599,177)</b>

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**A. Expenses**

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PG&E states in testimony that forecast AC interference expense “includes the investigation to identify the locations with a possible AC interference threat and to perform the risk ranking of inspection data.”<sup>23</sup> However, PG&E did not provide workpapers substantiating this expense forecast. Without supporting workpapers, PG&E cannot show that its forecast results in just and reasonable rates, however ORA does not recommend a disallowance at this time with the expectation that PG&E will provide workpapers in rebuttal.

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<sup>23</sup> PG&E Prepared Testimony, Volume 1 (Peralta), p.7-32.



1           **B. Capital Expenditures**

2           PG&E states in testimony that “forecast AC interference capital expenditures  
3 includes general design and mitigation work, installation of 100 AC coupon test  
4 stations for monitoring, as well as the four specific induced AC projects mentioned  
5 [in testimony]”<sup>24</sup> These four projects cover six pipelines and combined result in a  
6 capital expenditure forecast of \$5.8 million. PG&E has also forecast \$3.4 million for  
7 AC mitigation elsewhere on PG&E’s system and \$1.2 million for installation of AC  
8 coupons.

9           As stated above, PHMSA regulations require that gas pipeline operators  
10 monitor for and mitigate stray currents. PG&E does not appear to have performed  
11 work in accordance with this nearly 40 year-old regulation. The most substantial of  
12 the four induced AC projects included in PG&E’s testimony involves AC mitigation  
13 along L-401, which runs parallel to a 500kV electric transmission line. In workpapers,  
14 PG&E states that during the 1993 and 1994 construction of L-401, 60 miles of AC  
15 mitigation were installed.<sup>25</sup> PG&E states that the service life of the previous  
16 mitigation measures was 20 years, and that installation was completed 19 years  
17 ago.<sup>26</sup> PG&E bases cost projections on the assumption that 50% of the original  
18 equipment is failing, and forecasts \$5.5 million in capital expenditure for 2015 to fund  
19 investigation of the state of existing mitigation measures and to replace failing  
20 components.<sup>27</sup>

21           PG&E’s failure to initiate a study into the condition of these mitigation  
22 measures until fully half of the AC mitigations along a major transmission line have  
23 presumably failed does not appear to meet the requirements of federal regulations  
24 requiring that operators continually monitor for and mitigate stray currents. The  
25 Company reports “experiencing inconsistent AC voltage and AC density reads with

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<sup>24</sup> PG&E Prepared Testimony, Volume 1 (Peralta), p.7-32.

<sup>25</sup> PG&E Workpapers, Chapter 7, p. WP 7-83.

<sup>26</sup> PG&E Workpapers, Chapter 7, p. WP 7-84.

<sup>27</sup> Id.

1 some of the reads above the original design criteria.<sup>28</sup> Design life is not an excuse  
2 for not maintaining infrastructure. The forecast capital expenditures on L-401 are  
3 clearly an instance of deferred maintenance, and should be treated as such by the  
4 Commission. Ratepayers should not be asked to solely bear the cost of PG&E's  
5 previous poor maintenance and inspection practices.

6 ORA recommends that the Commission accept PG&E's forecast for  
7 inspection, but place a 50% cost cap on funds for mitigation as presented in Table 7-  
8 6. Ratepayers should not bear the entire cost of bringing the system into compliance  
9 with longstanding federal regulations. PG&E has not demonstrated that the  
10 mitigation work included in the Company's forecast is anything but deferred  
11 maintenance.

## 12 **VI. DISCUSSION / ANALYSIS OF DC INTERFERENCE**

13 Similar to AC interference, interference from stray Direct Current (DC) can  
14 accelerate external pipeline corrosion. Federal regulations do not differentiate  
15 between AC and DC; the same regulations per § 192.437 apply to both, requiring  
16 the operator to minimize the effects of stray currents on the pipeline.

17 PG&E is forecasting \$2.6 million in DC interference expense in 2015. The  
18 Company is forecasting \$801,786 in capital expenditures for 2015, \$822,018 for  
19 2016, and \$843,748 in 2017. As with all forecasts relating to corrosion control, the  
20 extent to which this forecast consists of incremental spending is unclear, given  
21 PG&E's 2012 redesign of major work categories. PG&E was further unable to  
22 provide authorized spending levels from the previous rate case period as  
23 established in Gas Accord V.<sup>29</sup>

24 As stated above, PHMSA regulations require that gas pipeline operators  
25 monitor for and mitigate stray currents. PG&E does not appear to have performed  
26 work in accordance with this regulation. As with AC interference, PG&E is currently

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<sup>28</sup> PG&E Prepared Testimony, Volume 1 (Peralta), p.7-84.

<sup>29</sup> PG&E Response to TURN-DR-14 Q1.

1 formalizing a DC interference mitigation program, but according to PG&E’s  
 2 consultant, as of May 2014 PG&E “does not have a written plan to identify, test for,  
 3 and minimize the detrimental effects of stray currents per 49 CFR 192.437 (a) and  
 4 PHMSA part 92 Guidance.”<sup>30</sup>

5 As the issues relating to AC interference are so similar, ORA has based its  
 6 recommendation for both on the same basic policy. Consistent with most other  
 7 instances of clear deferred maintenance in PG&E’s corrosion control forecasts, ORA  
 8 recommends that that the Commission accept PG&E’s forecast for inspection, but  
 9 place a 50% cost cap on ratepayer funds for mitigation.

10 The following tables summarize PG&E’s request and ORA’s  
 11 recommendations for expense and capital expenditures relating to DC interference  
 12 mitigation.

13 **Table 7-10**  
 14 **DC Interference Expenses for TY 2015 (in dollars)**

Order Description	PG&E 2015	ORA 2015	Adjustment
Interference - LTRAN	132,319	104,960	(27,359)
41740772-GCUST5790 INTERFERENCE INVESTIG	-	-	-
Interference - STOR	8,821	6,997	(1,824)
Interference - LTRAN	2,011,251	1,595,394	(415,857)
Interference - L401	17,643	13,995	(3,648)
Interference - NPATH	26,464	20,992	(5,472)
Interference - NSPATH	8,821	6,997	(1,824)
Interference - SSPATH	246,996	195,926	(51,070)
Interference - BALOP	61,749	48,981	(12,768)
Interference - STNPC	37,805	29,989	(7,817)
HPD	-	-	
<b>Direct Current Expense Total</b>	<b>2,551,869</b>	<b>2,024,231</b>	<b>(527,638)</b>

<sup>30</sup> Exponent *PG&E Gas Transmission & Distribution Corrosion Program Health Assessment*, p. 48; provided in PG&E Response to ORA-DR-73 Q13.

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**Table 7-11**  
**DC Interference Capital Expenditures for 2015 (in dollars)**

Order Description	PG&E 2015	ORA 2015	Adjustment
Interference Mit - LTRAN	217,539	108,769	(108,769)
Interference Mit BALOP	101,518	50,759	(50,759)
Interference Mit L401	14,503	7,251	(7,251)
Interference Mit SPATHN	14,503	7,251	(7,251)
Interference Mit SPATHS	391,570	195,785	(195,785)
P.03616-Capitol BART interference Remmed	-	-	-
Interference Mit STNPC	62,154	31,077	(31,077)
GSM, Cathodic Protection	-	-	-
<b>Direct Current Capital Total</b>	<b>801,786</b>	<b>400,893</b>	<b>(400,893)</b>

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### **A. Expenses**

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ORA recommends that that the Commission accept PG&E's forecast for inspection, but place a 50% cost cap on funds for mitigation as presented in Table 7-10. Ratepayers should not bear the entire cost of bringing the system into compliance with longstanding federal regulations. PG&E has not shown that the mitigation work included in the Company's forecast is not deferred maintenance.

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The adjustments recommended by ORA were developed using the ratio of inspection to mitigation (approximately 59% investigation, 41% mitigation) in PG&E's expense forecast as shown in PG&E's workpapers.<sup>31</sup> ORA applied this ratio to each expense line item to determine the breakdown of investigation to mitigation forecast. ORA then added 50% of the forecast mitigation to PG&E's inspection forecast in order to develop an appropriate cost cap. The resulting adjustments are shown in Table 7-10 above. ORA recommends a total expense forecast of \$2,024,231 for DC interference mitigation.

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### **B. Capital Expenditures**

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As with the DC mitigation expense forecast, ORA's methodology in developing a capital expenditure forecast was to apply a 50% cost cap to PG&E's mitigation forecast. As the DC mitigation capital forecast consists entirely of

<sup>31</sup> PG&E Workpapers, Chapter 7, p. WP 7-27.

1 mitigation, this resulted in a 50% reduction to each DC interference capital  
2 expenditure line item, and an overall ORA forecast of \$802,000 for 2015.

### 3 **VII. DISCUSSION / ANALYSIS OF ATMOSPHERIC CORROSION**

4 Atmospheric Corrosion can occur on exposed transmission pipes, which  
5 cannot be protected by cathodic protection as they are not in contact with soil.  
6 According to PG&E's workpapers, the only protection available to inhibit this type of  
7 corrosion is adequate coating.<sup>32</sup>

8 PG&E is forecasting \$11.8 million in atmospheric corrosion-related expense  
9 for the 2015 TY. The Company is forecasting \$10.3 million in capital expenditures for  
10 2015, \$16.5 million for 2016, and \$15 million in 2017. The extent to which the  
11 forecast consists of incremental spending is unclear, given PG&E's 2012 redesign of  
12 major work categories, and PG&E was unable to provide authorized spending levels  
13 for Atmospheric corrosion from the previous rate case period as established in Gas  
14 Accord V.<sup>33</sup> PG&E was further unable to provide any information on actual program  
15 spending prior to 2009.<sup>34</sup>

16 As elsewhere in this report ORA's position relating to deferred corrosion  
17 control maintenance that ratepayers should not be asked to bear the full cost of  
18 performing such work. ORA applied the same methodology to develop a forecast for  
19 atmospheric corrosion as was applied to AC and DC mitigation.

20 The following table summarizes PG&E's request and ORA's recommendation  
21 for Atmospheric Corrosion expense.

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<sup>32</sup> PG&E Prepared Testimony, Volume 1 (Peralta), p. 7-47.

<sup>33</sup> PG&E Response to TURN-DR-14 Q1.

<sup>34</sup> PG&E Response to TURN-DR-14 Q2.

**Table 7-12**  
**Atmospheric Corrosion Expenses for TY 2015 (in dollars)**

Order Description	2015 Forecast	ORA 2015	Adjustment
Atmospheric Cor Insp & Mit-BALOP	867,447	683,968	(183,479)
Atmospheric Cor Insp & Mit-LTRAN	1,665,498	1,313,219	(352,279)
Atmospheric Cor Insp & Mit-NPATH	416,374	328,305	(88,070)
Atmospheric Cor Insp & Mit-NPATHL2	451,072	355,663	(95,409)
Atmospheric Cor Insp & Mit-NSPATH	6,523,200	5,143,440	(1,379,760)
Atmospheric Cor Insp & Mit-SPATH	9,368,425	7,386,855	(1,981,570)
Atmospheric Cor Insp & Mit-L401	416,374	328,305	(88,070)
Atmospheric Cor Insp & Mit-STNPC	416,374	328,305	(88,070)
Atmospheric Cor Insp & Mit-STOR	312,281	246,229	(66,052)
GT Painting & Coating Maintenance	-	-	-
GT Station Painting Program	-	-	-
HPD	-	-	-
<b>Atmospheric Corrosion Expense Total</b>	<b>20,437,046</b>	<b>16,114,288</b>	<b>(4,322,757)</b>

#### **A. Expenses**

The adjustments recommended by ORA were developed using the ratio of inspection to mitigation (approximately 58% investigation, 42% mitigation) in PG&E's expense forecast as shown in PG&E's workpapers.<sup>35</sup> ORA applied this ratio to each expense line item to determine the breakdown of investigation to mitigation forecast. ORA then added 50% of the forecast mitigation to PG&E's inspection forecast in order to develop an appropriate cost cap . The resulting adjustments are shown in Table 7-12 above, as is ORA's total expense forecast recommendation of \$16,143,948 for Atmospheric Corrosion.

### **VIII. DISCUSSION / ANALYSIS OF CATHODIC PROTECTION**

PG&E states in workpapers that cathodic protection (CP) is "a method to prevent corrosion [of pipelines] in soil by applying a direct current from an anode to the facility being protected."<sup>36</sup> CP systems cause the anode to corrode in place of the

<sup>35</sup> PG&E Workpapers, Chapter 7, p. WP 7-49.

<sup>36</sup> PG&E Workpapers, Chapter 7, p. WP 7-8.

1 metal pipeline. PHMSA requires that all buried or submerged gas pipelines installed  
2 after July 31, 1971 have CP systems.<sup>37</sup> PHMSA further requires that CP systems be  
3 monitored regularly and that appropriate records be kept for the lifetime of the  
4 pipeline.<sup>38</sup>

5 PG&E is forecasting expense and capital expenditures relating to cathodic  
6 protection in a number of areas. PG&E did not however provide any workpapers  
7 substantiating the Company's expense forecast for either cathodic protection  
8 resurvey or for cathodic protection troubleshooting. PG&E states that "the expense  
9 forecast for CP resurvey is based on recorded cost for distribution CP resurveys  
10 adjusted to take into account transmission [cathodic protection area]  
11 characteristics,"<sup>39</sup> and that the expense forecast for CP troubleshooting is "based on  
12 the 2013 budget."<sup>40</sup> Without supporting workpapers, PG&E cannot show that its  
13 forecast results in just and reasonable rates, however ORA does not recommend a  
14 disallowance at this time with the expectation that PG&E will provide workpapers in  
15 rebuttal.

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<sup>37</sup> 49 CFR §192.455 (a).

<sup>38</sup> 49 CFR §192.491.

<sup>39</sup> PG&E Prepared Testimony, Volume 1 (Peralta), p. 7-18.

<sup>40</sup> PG&E Prepared Testimony, Volume 1 (Peralta), p. 7-19.