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**CUE-SDG&E-DR-04**
**SDG&E 2016 GRC – A.14-11-003**
**SDG&E RESPONSE**
**DATE RECEIVED: APRIL 27, 2015**
**DATE RESPONDED: MAY 14, 2015**

1. SDG&E was asked in DR CUE 2-37b and c to identify the number of switches identified for replacement each year, and the number actually replaced. The difference between these two numbers indicates the change in the backlog of switches needing replacement was 39 in 2010 (61 identified as needing replacement, 22 actually replaced), and then 5 in 2011, -6 in 2012, 27 in 2013, and 14 in 2014. Please confirm that:

    a. The numbers reported in response to DR CUE 2-37a and b are correct answers to the questions posed by CUE; and
    b. The difference between the number of switches identified as needing replacement, and the number actually replaced, does indeed represent the increase in the backlog of switches needing replacement.

**SDG&E Response:**

a. Yes, the numbers reported in response to DR CUE 2-37a and b are correct.
b. Yes, the difference between the number of switches identified as needing replacement and the number actually replaced represents the increase (or decrease) in the overall backlog of switches needing replacement.

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2. SDG&E was asked in DR CUE 2-37g for the number of switches identified for replacement but not yet replaced as of the end of each of the years 2009-14, inclusive. SDG&E's response to DR CUE 2-37g shows that the backlog increased by 10 in 2010 (from 196 at year-end 2009 to 206 at year-end 2010), and then by -14 in 2011, -36 in 2012, 10 in 2013, and 9 in 2014. Please confirm that:

   a. The numbers reported in response to DR CUE 2-37g are correct answers to the question posed by CUE;
   b. The difference between the number of switches identified as needing replacement but not yet replaced, from one year to the next, does indeed represent the increase in the backlog of switches needing replacement; and
   c. The numbers provided in response to DR CUE 2-37g are for underground switches. If not, please re-answer DR CUE 2-37g for underground switches.

**SDG&E Response:**

a. The figures from DR CUE 2-37g are incorrect; the correct figures are shown in the table below:

| YEAR | Backlog |
|---|---|
| 2009 | 212 |
| 2010 | 251 |
| 2011 | 256 |
| 2012 | 250 |
| 2013 | 277 |
| 2014 | 291 |

b. Yes, the difference between the number of switches identified as needing replacement but not yet replaced, from one year to the next, does represent the increase (or decrease) in the backlog of switches needing replacement.
c. Yes, the numbers provided in response to DR CUE 2-37g are for underground switches.

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3. Please explain why the annual change in the backlog is different for each of the years 2010-14, inclusive, when the responses to DR CUE 2-37g are compared to the responses to DRs CUE 2-37b and c.

**SDG&E Response:**

The corrected annual changes in backlog for the years 2010-14 are shown in the table below:

| | 37c | 37b | | 37g (corrected) |
|---|---|---|---|---|
| YEAR | Replaced | Identified for Replacement | Difference between Identified and Replaced | Backlog |
| 2009 | 36 | 31 | -5 | 212 |
| 2010 | 22 | 61 | 39 | 251 |
| 2011 | 37 | 42 | 5 | 256 |
| 2012 | 50 | 44 | -6 | 250 |
| 2013 | 32 | 59 | 27 | 277 |
| 2014 | 40 | 54 | 14 | 291 |

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4. SDG&E was asked in DR CUE 2-37f for the number of underground switches on the SDG&E system as of the end of each year from 2009-14, inclusive. Please provide an expanded response to DR CUE 2-37f indicating:

   a. The number of operable underground switches in service;
   b. The number of underground switches deemed "in service" but identified as "DOE (Do not Operate Energized);"
   c. The number of underground switches deemed not in service because of their "DOE (Do not Operate Energized)" status;
   d. The number of underground switches deemed not in service for some other reason besides DOE status;
   e. Any other category of underground switch not included in one of the preceding four categories in subparts a-d of this question (with an explanation of the nature of the category); and
   f. The total number of underground switches of all types, and an explanation of any discrepancy between that number and the sum of the number of underground switches identified in response to subparts a-e of this question.

**SDG&E Response:**

a. See table below;
b. See table below;
c. 0;
d. 0;
e. 0;
f. See table below.

| Year End | Total Underground Switches | In Service DOE Switches | Operable Switches |
|---|---|---|---|
| 2009 | 3034 | 212 | 2822 |
| 2010 | 3135 | 251 | 2884 |
| 2011 | 3255 | 256 | 2999 |
| 2012 | 3388 | 250 | 3138 |
| 2013 | 3497 | 277 | 3220 |
| 2014 | 3651 | 291 | 3360 |

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5. Please provide a table showing, as of year-end for each of the years, the number of underground switches in service, by year of installation (e.g., for the 3651 total underground switches at year end 2014 (per response to Dr CUE 2-37f; this number may change depending on the response to subpart a of the preceding question), how many were installed in 2014, how many in 2013, how many in 2012, and so on.

**SDG&E Response:**

SDG&E does not have complete historical records to determine precise installation dates for all underground switches.

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6. Please confirm that the average age of switches in service at the end of 2014, as calculated from the response to the previous question, is the same as the average age of 14 years previously reported by SDG&E in response to DR CUE 2-37e. If not, please provide a reconciliation showing how the response to DR CUE 2-37e was calculated, and why it differs from the average end-2014 age implied by the response to the preceding question.

**SDG&E Response:**

SDG&E does not have complete historical records that can provide an accurate average age for underground switches.

But based on the limited work order dates available the average age is estimated at approximately 14 years.

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7. For each of the years 2014-7, please provide:

   a. The miles of underground conduit expected to be in service at the end of the year;
   b. The miles of existing underground conduit expected to be replaced during the year; and
   c. The dollars expected to be spent during the year replacing existing underground conduit.

**SDG&E Response:**

   a. This information is not available for the years 2014-7;
   b SDG&E does not have an estimate for replacing underground conduits during years 2014-7;
   c SDG&E does not have an estimated dollar spend for replacing existing underground conduit during years 2014-7.

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8. For each of the years 2014-7, please provide:

   a. The miles of unjacketed underground cable expected to be in service at the end of the year;
   b. The miles of existing unjacketed underground cable expected to be replaced during the year; and
   c. The dollars expected to be spent during the year replacing existing underground unjacketed cable.

**SDG&E Response:**

a. 2014 – 1897 miles;
   2015 – 1832 miles;
   2016 – 1765 miles;
   2017 – 1698 miles;

b. 2014 – 65 miles;
   2015 – 65 miles;
   2016 – 67 miles;
   2017 – 67 miles;

c. 2014 - $8,000,000;
   2015 - $8,800,000 ;
   2016 - $8,800,000;
   2017 - $8,800,000.

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9. For each of the years 2014-7, please provide:

   a. The miles of Aldyl-A gas pipe expected to be in service at the end of the year;
   b. The miles of Aldyl-A gas pipe expected to be replaced during the year; and
   c. The dollars expected to be spent during the year replacing Aldyl-A gas pipe.

**SDG&E Response:**

a.

| End of Year | Miles of Aldyl-A* |
|---|---|
| 2014 | 1,638 |
| 2015 | 1,633 |
| 2016 | 1,616 |

*The miles of Aldyl-A are derived by using the assumption that any plastic pipe with a year of operation before 1986 is Aldyl-A.

b.

| Year | Miles of Aldyl-A expected to be replaced |
|---|---|
| 2014 | 2 |
| 2015 | 5 |
| 2016 | 17 |

c.

| Year | Expected Replacement Cost of Aldyl-A (Direct$) |
|---|---|
| 2014 | $ 2,222,146 |
| 2015 | $ 2,238,763 |
| 2016 | $ 20,219,000 |

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10. For each of the years 2014-7, please provide:

    a. The number of circuit breakers expected to be in service at the end of the year;
    b. The number of circuit breakers expected to be replaced during the year; and
    c. The dollars expected to be spent during the year replacing circuit breakers.

**SDG&E Response:**

a. 2014 – 1,404;
   2015 – 1,410 ;
   2016 – 1,415 ;
   2017 – 1,420;
b. 2014 - 4 ;
   2015 – 7;
   2016 – 8;
   2017 – 4;
c. 2014 - $350,000;
   2015 - $650,000;
   2016 - $710,000;
   2017 - $350,000.

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11. For each of the years 2014-7, please provide:

a. The number of capacitors expected to be in service at the end of the year;
b. The number of capacitors expected to be replaced during the year; and
c. The dollars expected to be spent during the year replacing capacitors.

**SDG&E Response:**

| Year | In Service | Replaced* (Budget 209) | Cost of Replacements |
|---|---|---|---|
| 2014 | 1405 | 6 | $ 168,000 |
| 2015 | 1420 | 6 | $ 168,000 |
| 2016 | 1435 | 6 | $ 168,000 |
| 2017 | 1450 | 6 | $ 168,000 |

*The column for capacitors replaced only includes distribution shunt capacitors replaced under budget code 209 and does not include substation capacitors or capacitors operated under SCADA.

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12. For each of the years 2014-7, please provide:

    a. The number of underground switches expected to be in service at the end of the year;
    b. The number of existing underground switches expected to be replaced during the year; and
    c. The dollars expected to be spent during the year replacing underground switches.

**SDG&E Response:**

a. For the years 2014-17 it is expected that the following number of underground switches will be in service at the end of the year:

2014 - 3651
2015 - 3671
2016 - 3691
2017 - 3711

b. See table below
c. See table below

| YEAR | DOE (Non-SF6) Replaced | SF6 Replaced | DOE & SF6 Replaced | Approx. Replacement Cost (SF6 & DOE) |
|---|---|---|---|---|
| 2014 | 27 | 13 | 40 | $ 5,000,000 |
| 2015 | 40 | 20 | 60 | $ 7,500,000 |
| 2016 | 40 | 200 | 240 | $ 16,500,000 |
| 2017 | 40 | 200 | 240 | $ 16,500,000 |

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13. For each of the years 2014-7, please provide:

a. The number of SF6 switches expected to be in service at the end of the year;
b. The number of SF6 switches expected to be replaced during the year; and
c. The dollars expected to be spent during the year replacing SF6 switches.

**SDG&E Response:**

a. See table below;
b. See table below;
c. See table below.

| YEAR | SF6 Replaced | SF6 Remaining | Approx. SF6 Switch Replacement Cost |
|---|---|---|---|
| 2014 | 13 | 1017 | $ 650,000 |
| 2015 | 20 | 997 | $ 1,000,000 |
| 2016 | 200 | 797 | $ 10,000,000 |
| 2017 | 200 | 597 | $ 10,000,000 |

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14. As of the end of 2014, please identify the quantity of each of the following which have been identified as needing replacement, but which have not yet been replaced (i.e., the backlog of not-yet-made replacements):

    a. Miles of underground conduit;
    b. Miles of unjacketed underground cable;
    c. Miles of Aldyl-A gas pipe;
    d. Number of circuit breakers;
    e. Number of capacitors;
    f. Number of underground switches; and
    g. Number of SF6 switches.

**SDG&E Response:**

    a. 0 miles;
    b. 1897 circuit miles;
    c. Please see the response to CUE-SDG&E-DR-02 Question 22c: "The goal of SDG&E is not to replace all Aldyl-A pipe in the system, but rather use a performance based approach to pipe replacement. Thus, a timeline for full replacement of Aldyl-A has not been set."
    d. 30 circuit breakers;
    e. 2 capacitors;
    f. 291 underground switches;
    g. 52 (of the 291 underground switches needing replacement were) SF6 switches.

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15. Please provide SDG&E's best estimate of the average unit cost of incremental replacements for each of the following, above and beyond SDG&E's planned replacements:

    a. underground conduit (per mile);
    b. Unjacketed underground cable (per mile);
    c. Aldyl-A gas pipe (per mile);
    d. Circuit breakers;
    e. Capacitors;
    f. Underground switches; and
    g. SF6 switches.

**SDG&E Response:**

(All costs assumed to be direct dollars)

a. N/A;

b. Unjacketed feeder cable on a proactive basis - $243,000/mile;
   Unjacketed lateral cable on a proactive basis - $74,000/mile;
c. The estimated cost to replace Aldyl-A is $225 per foot, or $1.19million per mile as shown in the workpapers of witness Maria Martinez, SDG&E-07-CWP at page 28-29.
d. Circuit Breaker - $75,000 - $100,000;
e. Capacitor - $28,000;
f. Manual Switch - $50,000;
   SCADA Switch - $200,000;
g. SF6 Switch - $50,000.