

**Enclosure 4 – PG&E Data Response 2,  
Request date March 20, 2015**

We respectfully call your attention to the fact that accident reports and other information or materials that may be submitted as part of a Data Response are provided solely for the confidential use of the Commission and its staff and are not open to public inspection pursuant to Commission Resolution dated February 10, 1970, General Order 66-C and Public Utilities Code sections 315 and 583.

**Related ESRB Ref. Incident Number E20140827-01**  
**CPUC Data Request 2 – Raymond Cho**  
**Request Date: March 20, 2015**

1. Following the April 2013 Metcalf attack, what improvements did PG&E plan for substation and electric grid security? What improvements did PG&E plan specifically for the Metcalf substation? What changes (if any) did PG&E make to these plans following the 2014 Metcalf Burglary? Please list in detail.

**Answer:**

Following the April 2013 Metcalf incident, PG&E implemented immediate enhancements to the facility, included providing 24/7 on-site guard coverage and installing additional cameras for monitoring the site. PG&E also began long-term plans to improve the security at a number of critical substations, including Metcalf, which included enhancements to both physical security perimeters as well as significant technology enhancements.

Specifically, PG&E's long-term plan for Metcalf included the installation of privacy fencing or solid walls and equipment shielding, as well as technology improvements such as installation of thermal cameras with enhanced detection analytics, public address systems, improved lighting and gunshot detection. PG&E's long-term plan for Metcalf was still in progress when the August 2014 Metcalf burglary occurred.

Following the August 2014 Metcalf burglary, PG&E provided additional immediate enhancements such as more lighting, more cameras with [REDACTED] monitoring, and enhanced on-site patrolling guards. These were placed at both the Metcalf general construction yard and the substation.

Details about PG&E's long-term electric grid security plans are highly confidential. PG&E proposes to discuss those plans with SED in person.

Response provided by: Manho Yeung, Electric System Planning & Reliability

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2. How did PG&E determine that the improvements in security for Metcalf and other substations were appropriate? For the various projects and plans listed above, please provide PG&E's rationale in choosing these projects.

**Answer:**

Following the April 2013 Metcalf incident, PG&E teamed with third-party experts to determine both the specific security improvement measures and the specific substations where improvements were necessary. The specific substations were chosen through a combined internal and third-party effort between the third-party expert and PG&E's Electric Asset Management and Operations departments.

Response provided by: Manho Yeung, Electric System Planning & Reliability

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3. Prior to the Metcalf attack in 2013, what was PG&E's annual budget (for 2012 and 2013) for electric grid security? Please provide a general accounting of this budget. What portion of this was for cybersecurity and what portion was for physical security? What portion of this was for substation security?

**Answer:**

Historically, the majority of security costs for PG&E's operations have been aggregated and included as a component of administrative and general costs associated with PG&E real estate and information technology (IT) assets. However, as security needs and costs have grown in recent years, PG&E began to separately track a portion of substation- and grid-related security costs where feasible.

The grid security costs that PG&E separately tracked for 2012 and 2013 are described below. PG&E has separately identified security-related expenses and security-related capital costs.

Security Expenses

For PG&E transmission substation/grid security staff labor, PG&E spent \$1,187,000 in 2012 and \$2,045,000 in 2013. For contract security guards to patrol critical substations, PG&E spent \$4,200,000 in 2013.

For transmission substation cyber-security Information Technology costs, PG&E spent \$307,000 in 2013. PG&E did not track substation cyber-security costs separately in 2012.

For PG&E distribution substation/grid security, PG&E spent \$32,000 in 2012 and \$38,000 in 2013.

Security Capital Costs

For PG&E transmission substation/grid capital improvements, PG&E spent \$3,627,000 in 2012 and \$2,954,000 in 2013.

For PG&E distribution substation/grid capital improvements, PG&E spent \$21,000 in 2012 and \$228,000 in 2013.

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4. On a month by month basis, from April 2013 to the present date, which security improvement projects have PG&E planned and completed at Metcalf? At other substations and for other assets? Please list by substation or asset, and describe the project. Please list the planned completion and actual completion dates for all such projects. For pending projects please list the current estimated completion dates.

**Answer:**

In addition to the work described in Answer 1, above, additional security measures at Metcalf include installing custom gates and hiring and training an overnight monitoring staff position, both of which are expected to be completed by May 2015.

PG&E has plans to complete security improvement projects at multiple additional sites. Details about PG&E's long-term electric grid security plans are highly confidential. PG&E proposes to discuss those plans with SED in person.

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5. What specific barriers or delays (such as permitting issues), if any, has PG&E encountered in completing its projects, in particular those projects listed in Question 4 above? Be certain to include any problems affecting the schedule for the wall around the Metcalf substation.

**Answer:** In July 2014, PG&E re-designed and re-engineered its physical security plans due to operational impact and feasibility within a substation environment. As a result, additional change orders and subsequent permitting were required. PG&E received its initial permits on September 29, 2014.

In addition to the change in design and permitting, weather also proved to be an issue in December 2014. The heavy rains during this month slowed construction progress.

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6. During the June 18, 2014 substation security physical workshop PG&E representatives stated that the company would be spending \$100 million dollars over three years for security improvements. How specifically does PG&E plan to spend this money? Please provide a detailed accounting of PG&E's plans for spending this money. List specific projects including the assets (substations, other facilities) they are related to. What was PG&E's specific schedule for spending this money?

**Answer:**

Between 2014 and 2016, PG&E plans to invest more than \$100 million on substation security for the highest priority facilities. Among other measures, our plans include adding:

- Barriers around the perimeter to shield equipment and obstruct views inside the substation;
- Enhanced detection and deterrent systems; and
- Improved lighting and camera systems.

Details about PG&E's electric grid security plans are highly confidential. PG&E proposes to discuss those plans with SED in person.

Response provided by: Manho Yeung, Electric System Planning & Reliability

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7. As of June 2014, how much of the money identified in Question 6 above had been spent? For which projects?

**Answer:**

Details about PG&E's electric grid security plans are highly confidential. PG&E proposes to discuss those plans with SED in person.

Response provided by: Manho Yeung, Electric System Planning & Reliability



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8. Since June 2014, on a month by month basis, how much of the money identified in Question 6 above has been spent and for which projects?

**Answer:**

Details about PG&E's electric grid security plans are highly confidential. PG&E proposes to discuss those plans with SED in person.

Response provided by: Manho Yeung, Electric System Planning & Reliability

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9. Has any of the money PG&E plans to spend on security improvements been earmarked for training, testing, inspection, maintenance, or repair of equipment? Please list these specific projects including implementation dates.

**Answer:**

PG&E is funding physical security measures that account for security improvements, personnel enhancements, training and maintenance of security equipment; however, the funds have not been specifically “earmarked” for training or inspections. PG&E does have funding for required maintenance for specific security equipment under NERC CIP 006 compliance. Beginning in April 2015, PG&E designated certain dollars be identified to repair security equipment which was identified as broken. In the case of new security technology, maintenance will be covered under the product and service warranty for the first 12-month period of time.

Response provided by: Stephanie Douglas, Corporate Security

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10. Since the April 16, 2013 attack, please list all security breaches at PG&E facilities including unauthorized access, copper or other theft from substations, or any other violations of PG&E security protocols.

**Answer:**

The details of security incidents at PG&E's facilities are highly confidential and may be the subject of pending state and federal investigation. PG&E proposes to discuss those details with SED in person.

Response provided by: Stephanie Douglas, Corporate Security

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11. In PG&E's Metcalf root cause analysis (RCA) (page 12) PG&E states that following the April 16, 2013 Metcalf attack evaluations identified problems with alarms and training, and PG&E planned mitigation efforts scheduled for completion by Q4 2014. Please list the specific items identified in these evaluations, PG&E's mitigation plans, when they were identified, which items have been completed and when. Also include which items remain to be completed and their new estimated completion dates.

**Answer:**

Please note that the Root Cause Analysis report is highly confidential and was submitted to the CPUC pursuant to Section 583 and General Order 66-C.

Following the April 2013 Metcalf incident, the following items were identified. Their initial deadlines and current status are provided below:

- Install [REDACTED] Camera Systems at [REDACTED] Sites to Enhance Security - Deadline: 10/2/2014 – COMPLETE
- Desk Procedures: Address Alarm and Incident Response Protocols for Operations Center Personnel - Deadline: 9/10/2014 – COMPLETE
- Implement [REDACTED] Testing for all [REDACTED] Substations - Deadline: Immediate Action – COMPLETE
- Develop a Comprehensive Set of Security Policies and Procedures for Roles and Responsibilities for Contracted Guard Services - Deadline: Q4 2014 – COMPLETE
- Trained Security Control Center Operators on the Revised Alarm/Incident and Third-party Response Protocols - Deadline: 9/12/2014 – COMPLETE

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12. For how long has Physical Security Information Management (PSIM) software been commercially available? Based on PG&E's RCA (page 13) why has PG&E not installed PSIM software? For how long has PG&E known that the [REDACTED]

[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED] (RCA page 10)

**Answer:**

Please note that the Root Cause Analysis report is highly confidential and was submitted to the CPUC pursuant to Section 583 and General Order 66-C.

PSIM software has been an evolving product for the last 10 years. In January 2014, PG&E's Corporate Security Department undertook a Request for Proposal for PSIM software. PG&E is moving forward with a technical assessment and is planning and analyzing options for a comprehensive technology project to provide a comprehensive solution for the Security Control Center that includes PSIM.

Since their installation, PG&E has been aware that the [REDACTED] computer systems at its Security Control Center [REDACTED] PG&E added the [REDACTED] computer system to its Security Control Center approximately 3-4 years ago.

Response provided by: Stephanie Douglas, Corporate Security

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13. How much does PSIM software cost?

**Answer:**

PSIM software costs anywhere between \$2M to \$4M. However, PSIM software cannot be viewed as a stand-alone independent project without taking into consideration the technological dependencies and impacts to the existing IT infrastructure. PSIM requires a total integration of security field devices and IT infrastructure to support the software, an upgrade to the network, and annual Operating & Maintenance (O&M) costs once completed. Current IT estimates for the PSIM project is approximately \$11.3M without taking into consideration the infrastructure and network dependencies to make PSIM work as planned.

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14. Has PG&E ever requested funding for PSIM (or similar) software in any of its General Rate Cases? If so, when? If not, why not?

**Answer:**

Yes, PG&E requested funding for alarm system integration in its 2011 GRC, as well as for PSIM in its 2014 GRC. See 2011 GRC, Exhibit PG&E-6, page 6-18 (Risk and Audit testimony); 2014 GRC, Exhibit PG&E-9, page 3-20 (Risk and Audit testimony). Please note that these funding requests did not encompass a complete PSIM roll-out.

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15. PG&E's RCA (page 13) states that technology is available to provide [REDACTED] in [REDACTED] which would mitigate this issue. Has PG&E ever requested funding for such technology in any of its General Rate Cases? If so, when? If not, why not?

**Answer:**

Please note that the Root Cause Analysis report is highly confidential and was submitted to the CPUC pursuant to Section 583 and General Order 66-C.

No, PG&E has not requested funding specific to [REDACTED] camera technology because PG&E believed its existing camera technology – which has some capability to [REDACTED] in [REDACTED] – was adequate. Following the Metcalf incident, PG&E increased both [REDACTED] to improve camera [REDACTED]

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16. [REDACTED] (RCA, page 14)? Has PG&E ever requested funding for alarm maintenance in any of its General Rate Cases? If so, when? If not, why not?

**Answer:**

Please note that the Root Cause Analysis report is highly confidential and was submitted to the CPUC pursuant to Section 583 and General Order 66-C.

Each Line of Business is responsible for maintenance of security systems. [REDACTED]

PG&E's Risk and Audit Department did request funding in the 2011 and 2014 GRCs to enhance the company's physical security systems. See 2011 GRC, Exhibit PG&E-6, p. 6-18; 2014 GRC, Exhibit PG&E-9, page 3-20 (Risk and Audit testimony). Maintenance costs are also included within the Electric Line of Business' operating budgets, although alarm maintenance costs have not specifically been called out as part of PG&E's GRC requests.

Response provided by: Manho Yeung, Electric System Planning & Reliability

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17. How much money did PG&E save by removing the Roving Security Officer Supervisor position? (RCA, page 14) Has PG&E ever requested funding for the Roving Security Officer Supervisor position in any of its General Rate Cases? If so, when? If not, why not?

**Answer:**

Please note that the Root Cause Analysis report is highly confidential and was submitted to the CPUC pursuant to Section 583 and General Order 66-C.

The Roving Security Officer Supervisor cost approximately \$2400 per week. Security Officers were included in the Electric Transmission Operations group's substation protection efforts, which costs are recovered in the Transmission Owner case; such costs were not requested in the GRC.

Response provided by: Stephanie Douglas, Corporate Security

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18. If a need was identified in 2010 to [REDACTED] at the Security Control Center why did it take PG&E until April 2013 for PG&E to prioritize “action” on the PSIM? (RCA, page 15).

**Answer:**

Please note that the Root Cause Analysis report is highly confidential and was submitted to the CPUC pursuant to Section 583 and General Order 66-C.

Although PG&E previously identified a need to [REDACTED] at the Security Control Center, PG&E did not take action on PSIM until April 2013, after the initial Metcalf incident shed light on the need to prioritize security measures at our critical facilities.

Response provided by: Stephanie Douglas, Corporate Security

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19. Based on PG&E's [REDACTED] plan, when will PSIM be installed? (RCA. Page 15).

**Answer:**

Please note that the Root Cause Analysis report is highly confidential and was submitted to the CPUC pursuant to Section 583 and General Order 66-C.

PG&E anticipates that initial work for the PSIM will begin by the end of 2015, and that it will be [REDACTED] effort to complete PSIM installation.

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20. When will PG&E be utilizing Human Performance Tools such as '3-Way Communication' to ensure correct directions are acknowledged? (RCA, page 15). Has PG&E ever requested funding for utilizing Human Performance Tools in any of its General Rate Cases? If so, when? If not, why not?

**Answer:**

Please note that the Root Cause Analysis report is highly confidential and was submitted to the CPUC pursuant to Section 583 and General Order 66-C.

Three-way communications have been built into the Post Orders between the Security Control Center operators and the on-site security personnel. Please note that "human performance tools" are not actual tools (objects), but rather a system of establishing protocols and processes and then testing individuals' compliance with such protocols and processes. PG&E has not requested funding for human performance tools within the GRC.

Response provided by: Stephanie Douglas, Corporate Security

**Enclosure 5 – PG&E Data Response 2,  
Supplement, Request date  
March 20, 2015**