

PUBLIC UTILITIES COMMISSION

505 VAN NESS AVENUE
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January 2, 2015

Mr. Sumeet Singh, Vice President
Pacific Gas and Electric Company
Gas Asset and Risk Management
6111 Bollinger Canyon Road, Room 4590-D
San Ramon, CA 94583

GA2014-10

SUBJECT: Pacific Gas & Electric's (PG&E) Distribution Control Room Management Inspection

Dear Mr. Singh:

The Safety and Enforcement Division (SED) of the California Public Utilities Commission conducted a Control Room Management Inspection of PG&E's Gas Distribution Control Center (Center) on September 8-11, 2014. The inspection included a review of the Center's procedures and records for the period of April 15, 2013 through September 7, 2014, as well as a visit to the Control Room and interviews with control operators and coordinators.

SED's findings are noted in the Summary of Inspection Findings (Summary) which is enclosed with this letter. The Summary reflects only those particular records and facilities that SED inspected during the inspection.

Within 30 days of your receipt of this letter, please provide a written response indicating the measures taken by PG&E to address the violations and observations noted in the Summary. Pursuant to Commission Resolution ALJ-274, SED staff has the authority to issue citations for each violation found during the inspection.

If you have any questions, please contact Fred Hanes at (415) 703-5264 or by email at fred.hanes@cpuc.ca.gov.

Sincerely,

A handwritten signature in blue ink that reads "Kenneth A. Bruno".

Kenneth Bruno
Program Manager
Gas Safety and Reliability Branch
Safety and Enforcement Division

Enclosure: Summary of Inspection Findings

cc: Larry Berg, PG&E Gas Regulatory Support
Larry Deniston, PG&E Gas Regulatory Support

SUMMARY OF INSPECTION FINDINGS

I. Probable Violations

A. PG&E's Internal Inspection Findings

No internal findings were presented during the inspection.

B. SED Findings

1. Title 49 CFR §192.631(e)(4) states:

“Alarm management. Each operator using SCADA system must have a written alarm management plan to provide for effective controller response to alarms. An operator’s plan must include provisions to: ...Review the alarm management plan required by this paragraph at least once each calendar year, but at intervals not exceeding 15 months, to determine the effectiveness of the plan;”

1.1

The PG&E Distribution Control Room Management Operations Manual (“CRM”) references PG&E Utility Procedure TD-4436P-03: Gas System Operations CRM-Alarm Management. The procedure calls for *“an annual review of the alarm management plan for effectiveness”*.

PHMSA guidance for evaluating §192.631(e)(4) gives some examples of the kind of metrics that could satisfy the alarm management plan effectiveness review as follows:

“Alarm management effectiveness metrics might include number (volume) of alarms, clarity of alarm descriptions, how alarms are displayed or presented to controllers, etc. Effectiveness could include, but not necessarily mean reduction in number of alarms or reduction in alarm volume.”

During the inspection, PG&E presented a draft copy of a CRM metrics document: Gas Distribution Control Center (GDCC) Metrics. The document includes a set of alarm management metrics along the lines of the PHMSA guidance. However, PG&E did not present an effectiveness review report that tracked performance against those metrics.

In addition, PG&E’s CRM Manual describes requirements for supplemental annual alarm management reviews. The PG&E procedure document TD-4436-P-03, Alarm Management, states:

“The GTCC, GDCC, and GCS&S managers (or delegates) must perform the following tasks once each calendar year, not to exceed 15 months to the date:

- *Oversee a review of the SCADA alarm system using an alarm definition and rationalization method to validate that the designated SCADA safety-related points, alarm criteria and responses are accurate.*
- *Oversee a review of the CRM SCADA alarm database to validate that the SCADA alarm values and descriptions are set accurately and support safe pipeline operations.*
- *Ensure implementation of changes required as a result of the review”*

These additional reviews would address, in part, the requirement for an annual alarm management plan effectiveness review.

PG&E did not present documentation to show that it conducted an annual alarm management effectiveness review. PG&E is in violation of §192.631(e)(4).

1.2

The PG&E CRM Manual includes an Alarm Management Philosophy document prepared by D. Roth, Inc., which provides a detailed treatment of alarm management effectiveness metrics and Key Performance Indicators (KPI's). As stated in the introduction, the Philosophy is applicable:

“...where all aspects of the alarm design (or redesign) are specified. It also contains all additional aspects of site infrastructure that are needed for project success. It serves as the entire conceptual and practical design basis for the work. All site personnel, all contractors, and all consultants will rely on it. Incident investigations will use it. Management will use it....”

While it may appear that the Philosophy is primarily a design document, there are sections that specify how some actions are to be performed once the alarm system is in use. For example, Section 7.4 “Alarm System Effectiveness” states (underlined for emphasis):

“The following alarm performance and other measurements will be made to track the general effectiveness of the alarm system:

- Measurement of frequency by “type of alarm”, location, classification, priority, time of day/week, alarm activation rates, time in alarm, number of standing alarms, per pipeline/facility/station.*
- Measure and track the answers on the Alarm Response checklist to determine any that need modification.”*

However, these metrics do not appear in the PG&E procedures that contain the requirement for annual alarm management effectiveness reviews (SCADA Alarm Plan section 11.2, and Alarm Management procedure TD4436P-03). The Philosophy document is mentioned at the end of these procedures as a supplemental or developmental reference without specifying that the Philosophy contains detailed metrics and KPI's for effectiveness measurement.

PG&E managers who are responsible for annual effectiveness reviews may not be sufficiently aware of the metrics defined within the Alarm Management Philosophy document, thus not making use of a resource that is intended to guide compliance with §192.631(e)(4). For example, the HCS Workload Study does not refer to the PG&E Philosophy when presenting metrics for alarm workload activity. Instead of relying on the Philosophy, it appears that HCS independently chose a set of metrics for evaluation of alarm activity.

Although PG&E's CRM plan contains various documents that reference alarm management effectiveness review, the plan does not have a comprehensive procedure that

clearly describe how PG&E conducts its alarm management effectiveness review. PG&E is in violation of §192.631(e)(4).

2. Title 49 CFR §192.631(d)(3) states:

“Train controllers and supervisors to recognize the effects of fatigue;”

As part of their fulfillment of the requirement to train personnel to recognize the effects of fatigue, the procedures in PG&E’s CRM Manual 3.0.5 state:

“The GTCC and GDCC managers (or delegate) must perform the following metrics-related tasks:

- 1. Develop and manage the metrics and tracking tools that measure the effectiveness of the fatigue mitigation plan.*
- 2. Perform a review of the metrics once each calendar year, not to exceed 15 months to the date.*
- 3. Report the results of the annual review to the senior director of gas system operations”*

During the inspection, PG&E did not have records to show that an annual fatigue mitigation effectiveness review had been performed. PG&E is in violation of §192.631(d)(3).

3. Title 49 CFR §192.631(g)(1) states:

“Review incidents that must be reported pursuant to 49 CFR part 191 to determine if control room actions contributed to the event and, if so, correct, where necessary, deficiencies related to: (i) Controller fatigue; (ii) Field equipment; (iii) The operation of any relief device; (iv) Procedures; (v) SCADA system configuration; and (vi) SCADA system performance.”

The PG&E CRM Manual Section 6.0.1, Reviewing Gas Incidents, omits reference to items ii) field equipment, and iii) relief devices, in the procedure for evaluating gas incident operating experiences for potential use in lessons learned.

PG&E is in violation of §192.631(g)(1).

4. Title 49 CFR §192.631(d)(4) states:

Establish a maximum limit on controller HOS, which may provide for an emergency deviation from the maximum limit if necessary for the safe operation of a pipeline facility.

As part of their fulfillment of the requirement to establish a maximum limit on controller HOS (hours of service), the PG&E shift scheduling procedures in CRM Manual 3.3.2 Section 1.1.5d incorporates the concept of a 35-hour “reset” period to provide sufficient sleep time after a number of consecutive night shifts as follows:

“35-hours off may be used as a “reset” within any sliding 7 day period if and only if it follows a sequence of two or more day shifts.”

PG&E presented a report that documents violations of the reset period. Eight violations occurred during the period April-October 2013, and were discovered by a review of timesheets conducted by a third party vendor on July 28, 2014. The Deviation Report found that the Distribution Control Center Supervisor misinterpreted the requirement that

the 35 hours of reset time must only follow two or more day shifts. In these cases, controller work schedules were created assuming that the reset period could follow any two types of shifts, regardless of whether those were day or night shifts.

PG&E is in violation of §192.631(d)(4).

II. Areas of Concern/ Observations/ Recommendations

Control Room Staffing:

The HCS Work Study dated 7 August, 2014 reviewed whether controllers have sufficient time to analyze and react to incoming alarms based on observation of overall controller activity including alarms for a one week period. The report concluded that staffing was generally adequate under normal operations but raised a concern that the shortage of personnel in the DC (Distribution Coordinator) position might lead to an overload of activity during high-stress or emergency situations.

SED recommends that PG&E evaluate its operations to ensure that it has adequate resources to effectively respond during high-stress or emergency situations.