Pacific Gas and Electric Company

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January 6, 2014

Mr. Ken Bruno
Gas Safety and Reliability Branch
Safety and Enforcement Division
California Public Utilities Commission
505 Van Ness Avenue
San Francisco, CA 94102

Re: State of California – Public Utilities Commission
General Order 112-E Audit of PG&E's Distribution Control Room Management

Dear Mr. Bruno:

The Safety and Enforcement Division (SED) of the CPUC conducted a Control Room Management audit of PG&E's Gas Distribution Control Center from September 8 through 11, 2014. On December 3, 2014, the SED submitted their audit report of findings. Attached is PG&E's response to the CPUC audit report[1].

Please contact Larry Berg at (925) 328-5758 or LMB5@pge.com for any questions you may have regarding this response.

Sincerely,

/S/
Bill Gibson

Attachments

cc: Aimee Cauguiran, CPUC
Fred Hanes, CPUC
Dennis Lee, CPUC
Larry Berg, PG&E
Larry Deniston, PG&E
Sumeet Singh, PG&E

[1] To the extent, if at all, that SED's Control Room Management Audit Report pertains to matters that may be determined to be within the scope of the Commission's November 20, 2014 Order Instituting Investigation and Order to Show Cause directed to PG&E, PG&E reserves the right to supplement its response in the course of that proceeding.

2014 Control Room Management Audit Attachment
PGandE Responses

CPUC Letter Finding #	CPUC Finding	PG&E Response	Associated Attachment (*File Name*)
	Probable Violations		
NOPV-1a	1. Title 49 CFR §192.605(a) states in part: "General. Each operator shall prepare and follow for each pipeline, a manual of written procedures for conducting operations and maintenance activities and for emergency response." Title 49 CFR §192.631(e)(4) states in part: "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;" a) 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 audit, 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.	PG&E respectfully disagrees with this finding. Title 49 CFR §192.631(e)(4) requires "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;" Alarm management effectiveness was reviewed according to requirements as set forth by federal and state regulations and PG&E. The PG&E review and associated changes are implemented through multiple venues. 1- Annual Review of Alarm Definition and Rationalization (ADR) As stated in Control Room Management (CRM) Manual Section 4.3.2.2 (first attachment), "As defined by the PG&E Alarm Philosophy, ADR is defined as the information about a given alarm that fully documents every operational aspect of the alarm. Gas Control Strategy and Support (GCS&S) Department is responsible for updating and managing the ADR, including the annual reviews. The ADR is extremely useful to both the controller and the alarm system designer as it provides a base for mutual clarity of alarm descriptions among other reasons. This section defines Alarm Prioritization, Safety Related Alarms, Alarm Response Codes and Alerts." GCS&S hosts an annual review of the alarm rationalizations with a goal to review Distribution alarm types, determine if the type is safety related or not, and if it has been given the appropriate response codes (i.e. Immediate notification, next day, etc.). Gas Distribution Control Center's (GDCC) first annual review took place on June 19, 2014. Attachment "Alarm Definition and Rationalization_CONF.pdf", from the meeting, reflects the validation of the designated SCADA safety related points, and whether the alarm criteria and responses are accurate.	*Distribution SCADA Alarm Plan_CONF.pdf* *Distribution SCADA Alarm Limits_CONF.pdf* *Alarm Definition and Rationalization_CONF.pdf*

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NOPV-1a (con't)	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 in accordance to the procedures it currently has in place to comply with §192.631(e)(4). This is a violation of §192.605(a).	2- Daily Review of Alarm Discrepancy Reports PG&E provides a daily "CRM GTCC/GDCC Alarm Discrepancy Report" (an example is provided in the attachment "Distribution SCADA Alarm Limits_CONF.pdf") and tracks discrepancies and safety related points. This is an important effectiveness tool as it provides the means of a daily quality control between alarm management requirements with actual SCADA alarm settings. 3- A Bi-Annual Review of alarm volume by an independent party, weekly department metrics, and daily operations report. PG&E has retained an independent industry expert, Human Center Solutions or HCS, to measure, among other things, alarm volume per controller. This is reinforced on a weekly basis by a department metrics report and daily operations report that measures controller response to alarms. All three of these tools provide PG&E the ability to efficiently measure the effectiveness of controllers' ability to manage alarms.	

2014 Control Room Management Audit Attachment
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NOPV-1b	b) 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).	PG&E respectfully disagrees with this finding. Title 49 CFR §192.631(e)(4) requires "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;" Per the reference in the CRM Manual, PG&E has used the Alarm Management Philosophy document to establish alarm management effectiveness. The Philosophy was written on July 8, 2011. It was adopted by GDCC since it's inception. However, it is not required for PG&E to use the Alarm Management Philosophy document completely, specifically as GDCC is a new department established on April 15, 2013. As GDCC matures, additional effectiveness metrics will be considered from the Alarm Management Philosophy Report by D-RoTH Inc, HCS services, or other best-in-class industry standards for inclusion in its alarm management plan.	

2014 Control Room Management Audit Attachment
PGandE Responses

NOPV-2	2. Title 49 CFR §192.605(a) states in part: "General. Each operator shall prepare and follow for each pipeline, a manual of written procedures for conducting operations and maintenance activities and for emergency response." 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 audit, PG&E did not have records to show that an annual fatigue mitigation effectiveness review had been performed as required by PG&E CRM Manual 3.0.5. PG&E is in violation of §192.605(a).	PG&E respectfully disagrees with this finding. GDCC personnel are trained to recognize the effects of fatigue through the following training: -Completion of Fatigue Recognition web-based training (858FATS & 859FATC). See attachment "WBT 859 Training_CONF.pdf". -Completion of training program by Circadian, an industry recognized third party contractor. The program provides an annual training, a session with controllers' families, and frequent fliers sent to controller's residence. The frequent flyer is a newsletter that is provided to an employee and their families about improving Health, Safety, and Quality of Life for People Who Work Non-Traditional Hours. See attachment "Circadian Training_CONF.pdf". Senior Director of Gas System Operations is notified by department manager of both contract with independent party, and gaps in the training completion. In addition to the training, a quality control tool has been developed as part of the Controllers Shift Change as stated in CRM 2.3 Section 1-14, where controllers note if they are fatigued or not at the beginning of their shift. If not, they assume their shift. If they do indicate they are fatigued, then SRDC, Control Room Supervisors, and Control Manager are notified for mitigation and steps are followed as stated in CRM 2.3, Sections 1-14 to address fatigue concerns. Another tracking tool used to measure the effectiveness of the fatigue mitigation plan is the completion and issuance of a CRM Deviation Report when the department has deviated from fatigue management requirements due to unforeseen or emergency conditions. Preventative measures are considered to prevent recurrence. PG&E is reviewing and reporting results of the metrics and tools more frequent than annually. These metrics and tracking tools provide the measurement of the effectiveness of the fatigue mitigation plan.	*WBT 859 Training_CONF.pdf* *Circadian Training_CONF.pdf*
NOPV-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).	CRM Manual Section 2.4.3 section was recently revised and published to include these items on December 22, 2014. See attachment "Distribution Abnormal Incident Reporting Process_CONF.pdf".	*Distribution Abnormal Incident Reporting Process_CONF.pdf*

NOPV-4	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).	PG&E self-identified this issue through a Deviation Report, as shared during the audit. Although PG&E meets PHMSA requirements of 8 hours of rest for controllers, a misinterpretation of PG&E requirements, in the first several months of GDCC's existence, led to 8 instances where some staff members were scheduled incorrectly to work. No fatigue deviations were observed during the year 2014. To prevent recurrence, gas control will pilot a new software application CIRCADIAN®, "Predictive Risk: Intelligent Safety Module", (PRISM™) in 2015. PRISM™ is a software application that provides operators with a comprehensive method for ensuring regulatory compliance and effective management of control room fatigue.	
	Areas of Concern/ Observations/ Recommendations		
AOC-1.0	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.	GDCC has staffed and plans to continue staffing its control room to not only meet regulatory requirements but be the leader in the industry. The hiring of GDCC personnel has been implemented in phases primarily based on training requirements, control room capabilities, controllers' feedback, and workload. The Distribution Coordinators (DC) position is a supporting role to the Senior Distribution Coordinator (SRDC). As the PG&E Distribution Control Room workload has begun to increase since opening on April 15, 2013, the need for the DCs has become evident as anticipated. During the Audit the week of Sept. 8, 2014, PG&E shared we were in the process of interviewing for four DC positions. The DCs along with any relief SRDC during the day shift will offset the workload and the concern of an overload activity for a SRDC during a high-stress or emergency situation. During the same week of the audit, PG&E shared we had extended one DC offer. We have since extended all four offers and filled three of the four positions with anticipation of filling the 4th position in early 2015.	