BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

Order Instituting Investigation on the Commission's Own Motion to Determine Whether Pacific Gas and Electric Company and PG&E Corporation's Organizational Culture and Governance Prioritize Safety.	Investigation 15-08-019 (Filed August 27, 2015)

OPENING BRIEF
OF THE OFFICE OF THE SAFETY ADVOCATE

PAUL ANGELOPULO
Attorney for
Office of the Safety Advocate

California Public Utilities Commission
505 Van Ness Avenue
San Francisco, CA 94102
Telephone: (415) 703-4742
Email: paul.angelopulo@cpuc.ca.gov

May 9, 2018

TABLE OF CONTENTS

Pages

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

Order Instituting Investigation on the Commission's Own Motion to Determine Whether Pacific Gas and Electric Company and PG&E Corporation's Organizational Culture and Governance Prioritize Safety.	Investigation 15-08-019 (Filed August 27, 2015)

OPENING BRIEF
OF THE OFFICE OF THE SAFETY ADVOCATE

Pursuant to Rule 13.11 of the Rules of Practice and Procedure of the California Public Utilities Commission (Commission) the Office of the Safety Advocate (OSA) hereby submits this Opening Brief in this *Order Instituting Investigation on the Commission's Own Motion to Determine Whether Pacific Gas and Electric Company and PG&E Corporation's Organizational Culture and Governance Prioritize Safety* (OII.) *knowing*

I. INTRODUCTION

Judging from Pacific Gas and Electric Company and PG&E Corporation's (PG&E) response to the OII and the NorthStar Report, (Report) it is premature to conclude that its recent implementation of new safety programs evinces an organizational culture and governance that prioritizes safety. Specifically, there also does not appear to be an acceptable tracking or benchmarking process to determine effectiveness. Since PG&E's attempt to improve its disreputable safety history is in its relative infancy, knowing whether safety is in fact prioritized at PG&E remains uncertain. However, OSA submits that *if* PG&E in fact carries out its plans as stated, and is given approval by the Commission to implement them subject to adoption of the recommendations proposed by OSA and TURN, this would be a good start toward establishing the desired safety culture and optimizing PG&E's ability to operate safely.

At last it now appears PG&E is no longer ignoring safety, and, taken at its word, should be commended for acknowledging its failures and its bonafide effort in responding to this OII and the NorthStar Report recommendations. Nevertheless, PG&E deserves vigilant safety oversight. Given the severity of its safety failures, its history of non-compliance with Commission Orders and statutory obligations, its disservice to its customers, the penalties it has incurred, its tarnished reputation, together with the sheer magnitude of the safety issues PG&E acknowledges still exist, it cannot be left alone to implement its nascent safety plans without continuing safety-specific oversight. For these reasons, OSA submits that this PG&E-specific OII should remain open and enter another phase.

We have now reached a point where PG&E's safety initiative has entered its post-embryonic phase. It now has a plan. The next phase of the proceeding should be directed toward evaluating the progress and outcome of that plan.

Having reviewed the Report and PG&E's testimony, the following are OSA's recommendations and identification of unresolved issues for the Commission to consider.

II. DISCUSSION

A. Measuring the Effectiveness of PG&E's Safety Culture Requires Further Development of Organizational and Safety Culture Metrics.

OSA's primary concern in this OII is the outcome. Without a predetermined tracking or benchmarking process to evaluate the effectiveness of PG&E's safety efforts, much of the work done in this OII would be rendered fruitless, as nobody could measure the outcome with any confidence. OSA submits that the metrics being applied by PG&E to measure its safety culture progress are inadequate. Effective organizational and safety culture metrics are fundamental to successfully measuring and evaluating PG&E's safety culture and governance.

OSA is concerned that the information obtained via metrics in the Report demonstrated a general lack of adequate leading indicator organizational metrics, including safety culture assessments. Safety failures can be a result of organizational

failures. Developing or changing an existing organizational culture into a desired safety culture is a gradual process that must spread throughout an organization – at all levels.[1] One or more generations of employees and management may be required to accomplish this.

Currently, at the beginning of this process, we only have alarm bells, recommendations and PG&E's statements of good intent, but not enough information or mechanisms to evaluate the progress of PG&E's safety culture. Reaching conclusions will of course take a long time, but if effective metrics are established now, the more valuable the information will be, and the sooner it will come. Given the difficulty in analyzing cultural changes, measuring improvement in any culture can best be done by establishing thresholds through metrics and then constantly monitoring them to identify areas of improvement or concern.

1. The SMAP proceeding is not necessarily the appropriate forum in which to develop organizational or safety culture metrics.

If, as PG&E proposes[2], this proceeding is closed by way of splintering oversight of safety issues to other proceedings such as General Rate Cases, (GRCs) Risk Assessment Mitigation Phase (RAMP), or the Commission's Safety Model Assessment Proceeding, (SMAP) for example, there remains the strong possibility that important safety issues identified in this OII will fall through the cracks or not receive the necessary attention by the Commission or PG&E. As discussed below, safety-related issues that cannot be considered thoroughly and fairly in other established proceedings should remain in this OII until resolved.

OSA is currently actively seeking to address organizational, safety culture, and public safety metrics in the Commission's SMAP proceeding (A.15-05-002) Metrics Working Group. The SMAP proceeding is directed toward the identification of a

[1] Institutional Organization for Safety and Health, "Promoting a Positive Culture" (https://www.iosh.co.uk/News/Promoting-a-positive-culture.aspx)

[2] See, e.g., PG&E Rebuttal Testimony, Exhibit PG&E- 02, p. 2-6.

standardized risk assessment methodology for use in Risk Assessment Mitigation Phase (RAMP) filings and General Rate Cases, which would allow all of the major utilities to offer comparable analyses of risk mitigation strategies proposed in connection with rate cases.

Additionally, per SED, it is too early to recommend a common risk evaluation methodology in the first SMAP phase. Among the reasons that SED came to this conclusion was that model granularity should be improved. The utilities should consider having two parallel risk assessment models, with one having high granularity and another having low granularity to compare the results obtained from both methods.[3] SED also asserted that RAMP filings should describe the company's safety culture, executive engagement, and compensation policies.

The outcome of OSA's efforts in the SMAP proceeding are uncertain, however, and since this proceeding, I.15-08-019, is focused on organizational culture and governance at PG&E, it is the most appropriate one to address organizational, safety culture, and public safety metrics at PG&E, particularly if they are not adopted in the SMAP proceeding.

In the SMAP Metrics Master List,[4] developed by the SMAP Technical Working Group, there are no metrics that address safety management systems (SMS) provided by the utilities other than Records and Information Management training metrics. In their joint response to SMS metrics for possible development proposed by OSA, the utilities dismissed them as vague, subjective and some as unrelated to safety. Their response indicated they did not realize these were meant to be a starting point for discussion, proposed for development by the working group, rather than the finished product. More

[3] Safety and Enforcement Division Evaluation Report on the Risk Evaluation Models and Risk-based Decision Frameworks in A.15-05-002 et al.
http://www.cpuc.ca.gov/WorkArea/DownloadAsset.aspx?id=10483

[4] Safety and Enforcement Technical Working Group SMAP Metrics Master List
http://www.cpuc.ca.gov/uploadedFiles/CPUC_Website/Content/Safety/Risk_Assessment/SMAP/Staff%20Proposal%20SMAP%20Metrics.xlsx

importantly, it indicated a lack of understanding of safety management systems -- their design and strategy.

One reason why OSA's proposed metrics are not being taken seriously may be that the SMAP proceeding concentrates on risk, and the participants do not appear to be focused on organizational, public or cultural aspects of safety.

Furthermore, SMAP is partially encumbered by the participation and individual nuances of a number of utilities, whereas this proceeding concentrates on PG&E alone. While some metrics may not be suitable for direct comparison between utilities, trends in metrics developed in this proceeding by PG&E could be beneficial to the Commission, other utilities, and stakeholders, and would lead to an earlier common evaluation methodology in the area of safety culture among utilities, similar to what is being sought in SMAP with regard to risk.

If the Commission orders the development of safety culture, public and organizational metrics in this proceeding, the process could start immediately and the chances are good that PG&E will develop and have these metrics in operation long before the next phase of the SMAP proceeding gets to the same stage of development. Considering these metrics in this proceeding would also have the added benefit of parties not being distracted in workshops by debates between utilities as to their relative value to each utility. Each utility's system differs in significant respects, for example, in terms of terrain, size, age of infrastructure, or the relative maturity of its safety culture and safety management systems. These potential obstacles would be avoided if PG&E is the sole subject of examination.

2. OSA's Metrics Proposal

OSA recommends that the parties in this proceeding should conduct meetings and deliberations for the purpose of developing clearly described and defined metrics pertaining to the measurement and effectiveness of PG&Es SMS. The metrics should address recognized elements of safety management systems as described in reference documents and guidelines offered by the Federal Aviation Administration, (FAA) the

Institute of Nuclear Power Operations, (INPO) and the American Petroleum Institute's (API) pipeline recommended practice API RP 1173.

Organizational, cultural, and public safety metrics must be included in the adoption of a full complement of safety metrics. These metrics should not be skewed or vulnerable to gaming, underreporting, bias, or misplaced incentives. Also, careful deliberation is necessary to avoid metrics that are vulnerable to driving underreporting or unintended behavior, or that fail to capture public safety. OSA is, however, opposed to the inadequate set of metrics that exist because, in part, they do not capture organizational culture.

In sum, SMS metrics at PG&E are needed to: i) make sure that risk assessments used in RAMP and GRC filings address important managerial and organizational factors that are leading indicators of risk and that can significantly improve the understanding and measurement of risk in these models; ii) significantly increase the granularity of those models; iii) provide information to significantly improve safety management in the utilities, and iv) allow the Commission to be better informed about utility safety in both its GRC proceedings and its general oversight of safety in the utilities.

In Attachment A to this Opening Brief, OSA hereby submits a series of recommended additional metrics for adoption in this proceeding.[5] They address the areas of process safety, safety training and competency, organizational safety culture, safety incident investigation, and public, contractor, and employee safety performance. If not adopted, they are at least a starting point for discussion. There will inevitably be debate as to the merits of these or other metrics, but OSA is confident that working together, the parties can agree upon a set of metrics that would be acceptable to the Commission so that this aspect of the OII's inquiry could be closed.

OSA recommends the Commission order ongoing SMS metric discussions within this OII proceeding to facilitate implementing this safety recommendation.

[5] See also, Exhibit OSA-1, Attachment X, where OSA presents non-PG&E-specific examples of desirable metrics for adoption in this OII.

3. Safety-related metrics should be tracked and reported to the Commission

OSA agrees with the Report's recommendation that the Commission, "working with all California IOUs, develop a listing and consistent definitions of key safety-related metrics to be tracked on a monthly basis and reported to the CPUC at an agreed upon frequency. Performance reporting should be handled in a non-punitive manner, but subject to audit by the CPUC."[6]

Additionally, OSA is concerned that utilities typically track employee lagging indicator safety metrics, such as fatalities and serious injuries, but generally fail to track and report on public safety metrics. For instance, eight members of the public died in the San Bruno pipeline explosion, but those fatalities would not have shown up in an Occupational Safety and Health Administration (OSHA) report. Thousands of residents and two schools were relocated as a result of the Aliso Canyon gas storage leak, but those again, would have not have shown up in an OSHA report.

The Report also recommends that the Commission "have meaningful, consistent routine reporting of safety performance and metrics to the CPUC (all major California Investor-Owned Utilities (IOUs))."[7] As discussed above, this cannot be done with the current metrics and surveys demonstrated by the Report. They do not appear to address organizational and managerial elements that must be a part of a utility's safety management system.

B. Accountability - NorthStar's Performance-Based Ratemaking Mechanism Recommendation still requires significant development before it is applied to PG&E.

The Report recommends that the Commission employ "a Performance-Based Ratemaking (PBR) mechanism that includes a safety element to be considered in the rate design phase of the TY2017 PG&E General Rate Case (A.15-09-011)… [and the]

[6] NorthStar Report at I-17.

[7] NorthStar at I-10.

mechanism should include a traditional rate of return component and a variable safety-related component based on pre-defined criteria and the discretion of the CPUC."[8]

Although OSA supports accountability and the motives behind incentivizing safety, the Commission should keep in mind that it has experienced several instances in which well-intended performance-based ratemaking initiatives resulted in unintended or undesired behaviors and outcomes. Several examples are described in the Commission's Safety and Enforcement Division's (SED) reports on this subject matter.

One of SED's reports describes how metrics, including safety metrics, associated with "explicit or implicit financial incentives may drive unintended or undesirable behaviors that are detrimental to safety".[9] Please see Attachment Y in Exhibit OSA - 1, which is an excerpt from Section 9.2 of that report, entitled "Risks Associated with Metrics." Section 9.2 describes a number of prior Commission attempts to provide performance incentives in which the outcome was not what was intended. One quote from the attachment states: "In a number of interviews, employees and supervisors stated that safety incentive programs acted as a disincentive for injury reporting."

Furthermore, SED's June 2017 Monthly Performance Report recommended that "the Commission should hold the utilities accountable in some way for determining whether the compensation incentive programs are effective at improving safety. Currently, there does not appear to be any tracking or benchmarking process to determine effectiveness".[10]

Developing and deciding upon accountability in a GRC proceeding, as PG&E proposes,[11] poses challenges. A GRC is a limited format for regulating safety. It comes on a three-year cycle and is driven by cost projections, demand forecasts and rates of return arguments, which can outweigh safety considerations. A PBR mechanism may suffer from use of lagging metrics of incidents and accidents to define performance. The

[8] NorthStar Report at pp. I-10 and I-17.

[9] Risk and Safety Aspects of Southern California Edison's 2018-2020 General Rate Case, at 66.

[10] Safety and Enforcement Division Monthly Performance Report – June 2017, at 12.

[11] See, e.g., PG&E Rebuttal Testimony, Exhibit PG&E- 02, p. 2-9.

"safety-related component" should promote safety management metrics as leading indicators. Otherwise the PBR will likely be only retrospective and not be targeted enough to drive the development of a mature SMS at PG&E. SMS metrics, once developed, could be applied to PG&E investment proposals such as those for risk mitigation. These should be analyzed and potentially discounted in relation to their promised risk reduction based on the Commission's assessment of the current state of a utility's SMS and safety culture.

There are however, no successful empirical examples of incentive-based ratemaking that OSA can find to support applying these analyses to PG&E at this time. This is an opportunity for the Commission to specify clearly that as part of a PBR development process that PG&E, along with other utility analysts and subject matter experts (SMEs), should participate in a set of workshops with the Commission to design and develop, among other things, a set of safety management metrics to aid in the development of criteria to determine the safety-related component of the PBR mechanism recommended in the Report. Once developed, they can be used for assessment of the current state of a utility's SMS, its safety culture, and help educate the safety component of PBR prior to a utility's participation in a general rate case (GRC) proceeding.

OSA therefore has concerns about NorthStar's Recommendation 3. Any adoption of such a mechanism should be explicit about the metrics and formula to be employed so that it may be properly vetted in this proceeding. OSA believes the Commission should not adopt a PBR mechanism without being explicit in this proceeding about the metrics and formula that would be applied.

C. Cost-Benefit Analyses of New Safety Initiatives Are Not Ready For Application.

The Report recommends that PG&E clearly define and articulate any new initiatives to improve safety culture, and perform cost-benefit analyses of these initiatives and identify performance measures."[12]

[12] NorthStar at III-22.

A cost-benefit analysis of safety culture initiatives, although desirable, may be an invitation to error at this juncture, based on a false precision about an uncertain process. How will interim and long-term benefits be measured? What constitutes a safety culture development cost? OSA is not saying questions like this cannot be answered, but much work still needs to be done. The hope in the Report's recommendation is that the cost-benefit initiative will ultimately improve safety culture and, ultimately, safety outcomes. OSA has concerns that this cost-benefit effort could subsequently lead to biased performance measures and assessments.

OSA recommends the Commission allow the safety culture development process to proceed for several years before looking at any formal cost benefit analysis of the process.

D. Appointing a Corporate Safety Officer

The Report recommends that PG&E "[a]ppoint a Corporate Safety Officer who has both operations and professional safety experience." The appointment of a safety officer as an instrument of managerial purpose is neither a necessary nor sufficient driver for the emergence of organizational culture. The existence of a specific safety officer may relieve leaders and managers of a sense of responsibility for safety, since another party is delegated that task and therefore the responsibility.

Neither Institute of Nuclear Power Operations (INPO), the Federal Aviation Administration (FAA) nor OSHA, nor API RP 1173 suggest the need for a safety officer in their guidelines for SMS and safety culture development.[13] Higher level commitment and accountability are discussed, but they do not specifically advocate a single safety officer. Safety commitment and responsibility should be integrated into the other

[13] INPO,"Principles for a Strong Safety Culture"
https://www.nrc.gov/docs/ML0534/ML053410342.pdf

FAA, "Safety Management Systems for Aviation Service Providers"
https://www.faa.gov/documentLibrary/media/Advisory_Circular/AC_120-92B.pdf

OSHA, "Safety and Health Program Management Guidelines"
https://www.osha.gov/shpmguidelines/SHPM_guidelines.pdf

American Petroleum Institute, "Pipeline Safety Management System Requirements"
https://www.pipelinelaw.com/wp-content/uploads/sites/19/2014/09/API-RP-1173.pdf

activities and responsibilities of higher level executives and managers, rather than have to compete from a separate position for the attention of highest level executives.[14]

One safety culture model proposed by the North American Regulators Working Group on Safety Culture (NARWGSC) asserts that "there [should be] an accountable officer (AO) designated. This delegation is appropriate based upon the organizational structure (i.e. the correct person is delegated with the authority and control for human and financial resources). The AO demonstrates understanding of and commitment to the role and responsibilities. There [should be] evidence of the AO taking action to resolve issues."[15] But at the same time the NARWGSC report also stresses that "all leaders are knowledgeable about the regulations, their own procedures and current safety activities, issues and challenges, such as causes of recent incidents, results of previous audits and ongoing or new safety programs. All leaders routinely dedicate significant time to safety, which includes talking to frontline staff about safety concerns and potential solutions and leaders are routinely involved in incident investigations/reviews and in resolving safety issues."[16]

Safety culture creates a stable bias in values and practices widely distributed throughout an organization. It should be enduring beyond the role of any particular person. A safety culture and its development should be "person-proof" -- it should not depend on the skills of a specific culture "czar" nor be undermined by the deficiencies or disinterest of a single individual.[17] The urge to impose accountability on this process is understandable. However, this accountability should be shared throughout an organization.

---

[14] What are the Greatest Challenges for Aviation Safety Officers? http://aviationsafetyblog.asms-pro.com/blog/greatest-challenges-for-aviation-safety-officers

[15] North American Regulators Working Group on Safety Culture (NARWGSC), "Safety Culture Indicators Research Project: A Regulatory Perspective".

[16] Id.

[17] The Negotiated Order of Organizational Reliability https://www.researchgate.net/publication/249625140_The_Negotiated_Order_of_Organizational_Reliability

OSA recommends the Commission allow PG&E discretion whether it wants, as it has had, a single safety officer. However, the Commission may want to ensure that if there is only one, in future PG&E safety assessments, surveys and interviews include questions pertaining to the functions and role of the safety officer.

E. Next Steps

OSA proposes the following as next steps in this proceeding:

i) this phase of the OII should close once the Commission is satisfied that PG&E has an effective and robust safety culture and governance improvement plan. Subject to the reservations and recommendations described above, OSA believes PG&E should be given the benefit of the doubt and receive approval to implement its safety plans as proposed;

ii) before this OII closes, the Commission must specifically identify individual proceedings or mechanisms (whether in this proceeding or another) designed to monitor and audit all the various aspects of PG&E's safety culture and safety performance to measure their effectiveness; and finally,

iii) PG&E must be held accountable for its safety performance on a permanent basis. Determining how to do so is problematic, and no party has proposed an acceptable answer to this issue. If the Commission agrees with the Report that accountability must be dealt with, it should specify clearly that as part of a PBR development process, that PG&E, along with other utility analysts and subject matter experts (SMEs), should participate in a set of workshops with the Commission to design and develop, among other things, a set of safety management metrics to aid in the development of criteria to determine the safety-related component of the PBR mechanism recommended in the Report.

III. CONCLUSION

OSA recommends that the parties in this proceeding should conduct meetings and deliberations for the purpose of developing clearly described and defined metrics pertaining to the measurement and effectiveness of PG&Es SMS. Safety-related issues that cannot be considered thoroughly and fairly in other established proceedings should remain in this OII until resolved. Since this proceeding, I.15-08-019, is focused on organizational culture and governance at PG&E, it is the most appropriate one to address

organizational, safety culture, and public safety metrics at PG&E. OSA's recommended metrics in Attachment A are a good starting point for discussion or adoption in this proceeding.

OSA believes the Commission should not adopt a PBR mechanism at this time without being explicit in this proceeding about the metrics and formula that would be applied. After deliberations among parties, a set of safety management metrics can be agreed upon to aid in the development of criteria to determine the safety-related component of the PBR mechanism recommended in the Report.

OSA recommends the Commission allow the safety culture development process to proceed for several years before looking at any formal cost benefit analysis of the process.

Respectfully submitted,

/s/ PAUL ANGELOPULO

PAUL ANGELOPULO
Attorney

Office of the Safety Advocate

California Public Utilities Commission
505 Van Ness Avenue
San Francisco, CA 94102
Telephone: (415) 703-4742
Email: paul.angelopulo@cpuc.ca.gov

May 9, 2018

ATTACHMENT A

TABLE OF CONTENTS

Metrics

OSA recommends the following metrics be adopted to evaluate PG&E's implementation of the NorthStar Report's recommendations.[1]

Process Safety

The National Energy Board (NEB) provides measures reporting guidelines that may be used to create metrics for each LOB. One of NEB's lagging measures, shutdowns for hazard control, "provides an indication of a company's safety culture by following the number of shutdowns to protect the public and the environment".[2]

- Shutdowns for Hazard Control
  - The total number of shutdowns of a pipeline segment or facility to protect the public, property and the environment as a result of:
    - emergency;
    - precautionary (i.e. a false alarm);
    - unplanned repair; and
    - planned integrity testing, maintenance or repair.

The Center for Chemical Process Safety's (CCPS) Process Safety Leading and Lagging Metrics has metrics criteria to determine "the effectiveness of the process safety management system to ensure that safety critical plant and equipment is functional" and to "determine how effectively the safety management system ensures that identified deficiencies of process safety equipment are fixed in a timely manner":[3]

- Mechanical Integrity
  - LOB plant effectiveness
    - (Number of inspections of safety critical items of plant and equipment due during the measurement period and completed on time/Total number of inspections of safety critical items of plant and equipment due during the measurement period) x 100%
  - LOB plant deficiency
    - (Length of time plant is in production with items of safety critical plant or equipment in a failed state, as identified by inspection or as a result of breakdown/Length of time plant is in production) x 100%

[1] May 8, 2017, I.15-08-019, Scoping Memo and Ruling of Assigned Commissioner, at 12 http://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M185/K575/185575689.PDF

[2] National Energy Board (NEB), "Pipeline Performance Measures Reporting Guidelines" https://www.neb-one.gc.ca/sftnvrnmnt/sft/pplnprfrmncmsr/pplnprfrmncmsrrprtngrgdnc-eng.pdf

[3] Center for Chemical Process Safety, "Process Safety Leading and Lagging Metrics", at 29-30 https://www.aiche.org/sites/default/files/docs/pages/CCPS_ProcessSafety_Lagging_2011_2-24.pdf

OSA Recommendation

The following safety metrics should be reported as part of this proceeding:

1. Shutdowns for Hazard Control – Public Safety
    a. Transmission/Distribution
        i. The total number of shutdowns of a pipeline segment (or other equivalent transmission/distribution infrastructure that would apply to other LOBs) to protect the public, as a result of:
            1. Emergency
            2. Precautionary (i.e. a false alarm)
            3. Unplanned repair
            4. Planned integrity testing, maintenance, or repair
    b. Facility
        i. The total number of shutdowns of a facility to protect the public, as a result of:
            1. Emergency
            2. Precautionary (i.e. a false alarm)
            3. Unplanned repair
            4. Planned integrity testing, maintenance, or repair
2. Mechanical Integrity
    a. LOB plant effectiveness
        i. (Number of inspections of safety critical items of each LOB's plant and equipment due during the measurement period and completed on time/Total number of inspections of safety critical items of each LOB's plant and equipment due during the measurement period) x 100%
    b. LOB plant deficiency
        i. (Length of time each LOB plant is in production with items of safety critical plant or equipment in a failed state, as identified by inspection or as a result of breakdown/Length of time each LOB plant is in production) x 100%

Safety Training and Competency

The Center for Chemical Process Safety's (CCPS) Process Safety Leading and Lagging Metrics has metrics criteria to acquire data about "prevention of and recovery from major accidents", "competency", and if "safe operating procedure … steps are followed":[4]

[4] Center for Chemical Process Safety, "Process Safety Leading and Lagging Metrics", at 33 https://www.aiche.org/sites/default/files/docs/pages/CCPS_ProcessSafety_Lagging_2011_2-24.pdf

- Process Safety Training and Competency
  - Training for Process Safety Management (PSM) Critical Positions
    - (Number of Individuals Who Completed a Planned PSM Training Session On-time)/(Total Number of Individual PSM Training Sessions Planned)
  - Training Competency Assessment
    - (Number of Individuals Who Successfully Complete a Planned PSM Training Session on the First Try)/(Total Number of Individual PSM Training Sessions with Completion Assessment Planned for that time period)
  - Failure to Follow Procedures/Safe Working Practices
    - (Number of safety critical tasks observed where all steps of the relevant safe working procedure were not followed/Total number of safety critical tasks observed) x 100%

OSA Recommendation

The following safety metric should be reported as part of this proceeding:

3. Safety Training and Staff Competency
   a. Training for PSM Critical Positions
      i. (Each LOB's Number of Individuals Who Completed a Planned PSM Training Session On-time)/(Each LOB's Total Number of Individual PSM Training Sessions Planned)
   b. Training Competency Assessment
      i. (Number of Individuals in each LOB Who Successfully Complete a Planned PSM Training Session on the First Try)/(Total Number of Individual PSM Training Sessions in each LOB with Completion Assessment Planned for that time period)
   c. Failure to Follow Procedures/Safe Working Practices
      i. (Number of safety critical tasks observed in each LOB where all steps of the relevant safe working procedure were not followed/Total number of safety critical tasks observed in each LOB) x 100%

Organizational Safety Culture

The North American Regulators Working Group on Safety Culture (NARWGSC), comprised of "representatives from the National Energy Board (NEB), Canada Newfoundland Labrador Offshore Petroleum Board (C-NLOPB), Canada Nova Scotia Offshore Petroleum Board (CNSOPB), United States' Bureau of Safety and Environmental Enforcement (BSEE), and the United States' Pipeline and Hazardous

Materials Safety Administration (PHMSA), [plus as of] 2014, the Alberta Energy regulator (AER) and the British Columbia Oil and Gas Commission (BCOGC)]…", provides Safety Culture Indicator Questions. These questions "point to organizational signals of strength or weakness that may provide an indication of the relative health of the culture":[5]

- Safety Culture Indicators Research Project Interview Questions
  - Can you tell me about a time you were conducting a(n) _____ (inspection, investigation, audit, company meeting) when you were left with a concern(s) about that company's commitment to safety (or safety culture)?
  - What did you see/hear/observe that resulted in a belief that there was an indication of a poor safety commitment/safety culture?
  - Tell me about a time when you were conducting a(n) _____ (inspection, investigation, audit, company meeting) when you were left with sense of comfort about that company's commitment to safety (or safety culture)?
  - In your own words, describe what safety culture means to you.

OSA Recommendation

The following safety metric should be reported as part of this proceeding:

4. Staff Safety Culture
   a. On a scale of 1 to 5, how well do you understand the term Safety Culture?
   b. How many times have you conducted your job when you were left with a concern(s) about company commitment to safety or safety culture?
   c. On a scale of 1 to 5, how would you rate the company's actual commitment to safety culture and providing an effective safe working environment?
   d. On a scale of 1 to 5, how well do your coworkers apply/follow the company's safety culture during work activities?
   e. On a scale of 1 to 5, how well do you apply/follow the company's safety culture during work activities?

Safety Incident Investigations

The Center for Chemical Process Safety (CCPS) – Guidelines for Risk Based Process Safety (GRBPS), has information that can be used to enhance organizational safety culture and

[5] North American Regulators Working Group on Safety Culture (NARWGSC), "Safety Culture Indicators Research Project: A Regulatory Perspective" https://www.neb-one.gc.ca/sftnvrnmnt/sft/sftycltr/sftcltrndctr-eng.html

create metrics. The following are paraphrased from the CCPS text, which may be used by company LOBs to affect organizational safety culture: [6]

- The number of repeat findings in audits and/or management reviews
- Time required to resolve deficiencies
- The number of/percentage of incidents attributed to each management system element
- The percentage of Management Reviews delegated to subordinates
- Percentage of near miss and incident investigations that identify management system weaknesses that were not detected by prior audits
- Percentage of inspections/preventive maintenance activities conducted according to schedule

Overland Consulting's report on the Focused Financial Audit of The Pacific Gas & Electric Company's Gas Distribution Operations, has information that is important to tracking backlog, as "an increasing backlog is indicative of staffing shortages" that can lead to "maintenance work not being completed in a timely manner."[7] This lead to one of the report's findings, where safety was affected, as "staffing shortages caused bottlenecks in the integrity management process."[8]

OSA Recommendation

The following safety metrics should be reported as part of this proceeding:

5. Repeated Recommendations
    a. Number of repeat recommendations, which are directly and indirectly related to organizational safety and safety culture incidents, submitted for review
6. Issue Resolution Time
    a. Time required to resolve each issue of organizational safety deficiency
    b. Average time required to resolve all issues of organizational safety deficiencies
7. Monitoring Organizational Safety Performance
    a. The type and number of findings in organizational safety audits

[6] Center for Chemical Process Safety (CCPS), "Guidelines for Risk Based Process Safety", 2010.

[7] May 31, 2013, I.13-03-007, Administrative Law Judge's Ruling Making Available Financial Audit Report on Gas Distribution System, Attachment, at 7-18 and 10-17 http://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M066/K068/66068555.PDF

[8] Id. at 2-7.

b. The number of incidents attributed to safety and safety related element failures

8. Detection
    a. Percentage of near miss investigations that identify management system weaknesses not detected by prior audits
    b. Percentage of incident investigations that identify management system weaknesses not detected by prior audits
9. Prevention
    a. Percentage of inspection activities, for each LOB, conducted according to schedule
    b. Percentage of preventative maintenance activities, for each LOB, conducted according to schedule
10. Staffing Shortages
    a. How many unfilled positions are there in each of the company's LOBs?
    b. How many unfilled corrective and preventative maintenance positions are there in each of the company's LOBs?
11. Backlog
    a. How much backlog, expressed as number of days, is there for each LOB?
    b. How much backlog, expressed as a number of days, is there in each of the company's LOBs for work duties performed specifically for, and related to, corrective and preventative maintenance?

Public, Contractor, and Employee Safety Performance

Metrics 12-24, and portions of 25, are agreed to in PG&E's Settlement Agreement approved in PG&E's 2017-2018 GRC decision, D.17-05-013, Section 4.2.8.9. Disclosure of Safety Metrics.[9]

OSA Recommendation

The following safety metrics should be reported as part of this proceeding:

12. Incidents of Wires Down
13. 911 Emergency Response
14. Dig-in Reductions
15. Gas Emergency Response
16. Diablo Canyon Safety and Reliability Indicators

[9] May 11, 2016, A.15-09-001, at 193-194
http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M186/K836/186836115.pdf

17. Hydro Public Safety Index
18. Lost Work Day Case Rate
19. Near-Hits Reported
20. Preventable Motor Vehicle Accidents
21. Serious Preventable Motor Vehicle Accidents
22. Contractor Lost Work Days
23. Contractor Days Away
24. Number of Fires Requiring Engine Response Attributed to PG&E Operations
25. Number of public, contractor, and employee fatalities and life altering injuries related to PG&E operations and facilities, broken down by type.