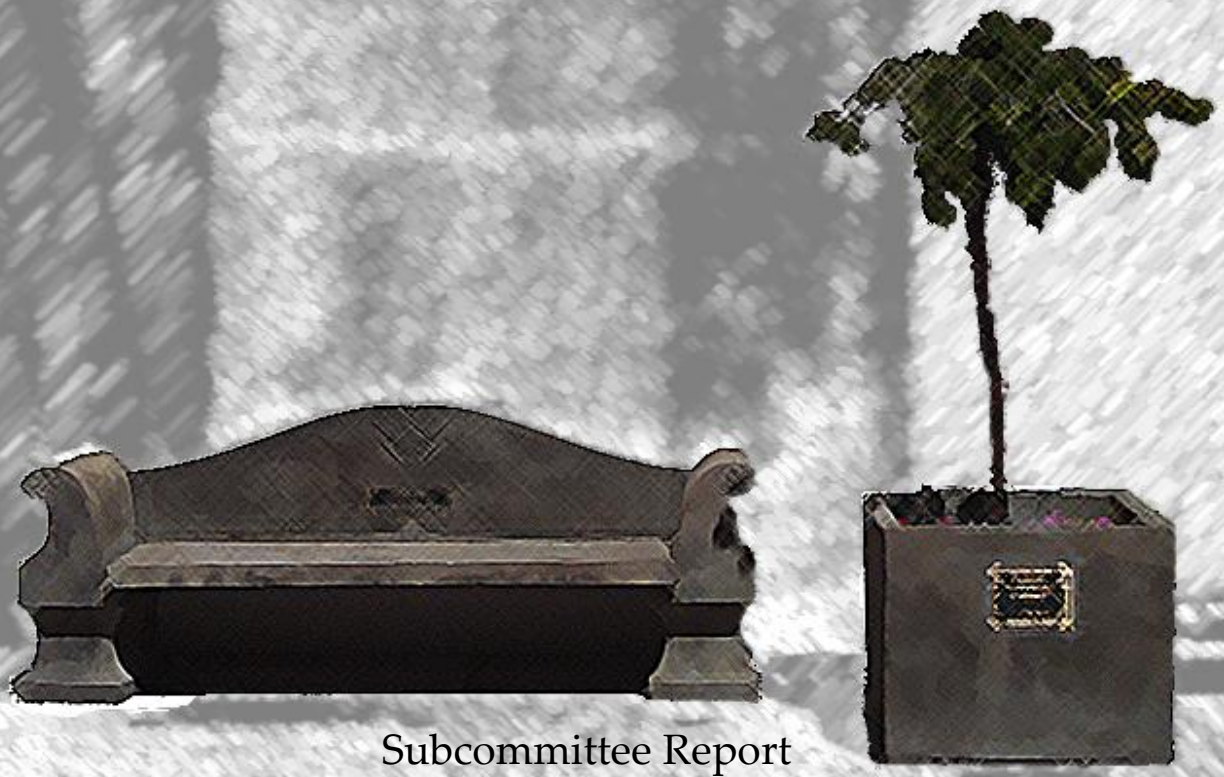
Slow Progress Toward Safety:

Improving Performance and Priorities in the Safety Plans at the California Public Utilities Commission



Subcommittee Report

October 2013

Senate Committee on Energy, Utilities, and Communication

Subcommittee on Gas and Electric Infrastructure Safety

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ABOUT THE COVER: The bench and tree pictured on the cover, located in the northeast corner of the California Public Utilities Commission's central courtyard, are memorials dedicated by Commission staff to the memory of the victims of the San Bruno explosion.

A plaque on the bench states,

"Dedicated to those
who lost their lives
and all those forever touched
by the natural gas pipeline explosion
in San Bruno on September 9, 2010"

The tree was dedicated specifically to the memory of Jacqueline Greig and her thirteen year-old daughter Janessa. Jacki had worked at the Commission for twenty-one years. A plaque on the tree planter states

"In Memory of
our friend and colleague
Jacki Greig
and her daughter
Janessa

Never to be forgotten
September 9, 2010"

California State Senate

Committee on Energy, Utilities, and Communications

Subcommittee on Gas and Electric Infrastructure Safety

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Executive Summary

The California Public Utilities Commission (CPUC) is a constitutionally-created state agency that has powers to regulate energy, transportation, water, and telecommunication corporations doing business in California. Its mission is to ensure safe, reliable, and affordable services from the regulated entities.

The CPUC is having difficulties convincing the public that it has the knowledge, skill, and ability to correct safety challenges identified by numerous independent reviewers since the natural gas pipeline explosion in San Bruno, California in September of 2010. Revelations regarding the effectiveness of its oversight during recent large-scale power outages in Southern California and disturbing results from a recent fiscal audit have broadened the public's concern about the CPUC's ability to manage its core functions.

This report examines current weaknesses of the CPUC's safety plans and identifies a path toward addressing those weaknesses to build public confidence in the CPUC's commitment and capabilities.

This report finds that:

- The CPUC's priorities, as determined by its use of discretionary resources, do not include safety.
- CPUC staff cannot carry out their safety mission as executive staff and commissioners have not addressed policy questions necessary to develop the safety programs and procedures needed to reform the organization.
- The CPUC lacks a common safety philosophy, integrated vertically throughout the organization, from Commissioner to staff to regulated entities.
- CPUC staff, if supplemented by outside experts, appear to have the tools necessary to effectively integrate safety into the regulatory process, but so far safety remains almost exclusively the responsibility of the safety division, and effective risk management has not been brought to bear on the CPUC's most pressing safety weaknesses.
- The CPUC continues to ignore safety implications in the development of its major policy initiatives, such as cybersecurity and energy storage, and only considers safety as a post-script—too late to affect policy.
- The CPUC's great safety policy initiative—to integrate safety considerations into ratemaking—has not progressed in a year and a half, despite management's claim that it had been a top commissioner priority.
- CPUC's safety plans have large, ill-defined goals, do not incorporate past experience, and lack the means for the CPUC or the public to assess success or failure. Safety actions are therefore uncoordinated and the CPUC will have no evidence to demonstrate that its response to the San Bruno disaster was or was not effective.

- Models for safety management exist and can be adapted to serve the CPUC.

This report recommends that the CPUC examine the policy choices that need to be made to carry out effective safety oversight, such as articulating an enforcement philosophy, determining the safety roles for staff outside of the safety division, implementing staff safety roles, and developing an understanding of how to consider safety in utility rate cases.

The CPUC's safety plans have thus far been far from comprehensive, so it should develop strategic plans for safety, which include goals, actions, and metrics to determine progress toward those goals. In order to track responsibilities, the CPUC should develop systems to track CPUC orders; to see the progress toward its goals, the CPUC will need to develop baselines for its safety-related data, which will require better data organization. These efforts should not be restricted to natural gas but for all the industries the CPUC regulates.

As staff appear to be unsure of how to better integrating safety into routine decision-making, the CPUC should develop readily-accessible guidance using pre-existing models at such organizations such as the Federal Aviation Administration.

The CPUC is an organization full of talented and dedicated individuals who, with effective direction and coordination, are capable of effecting the necessary changes.

Introduction

"I don't know what happened, but it's exploding. I'm a good 50 yards away and I can feel the heat from it."

"I'm at home in San Bruno, and we just had a massive explosion on San Bruno Avenue. I don't know if a plane crashed or a car…, but it is huge."

"My girlfriend, I had to take her to the hospital, she's burnt. Her house is one of the ones that's on fire… Her mother is missing, though."

911 recordings of callers on September 9, 2011[1]

This subcommittee report will describe the nature of the CPUC's challenge in enforcing safety practices within the utilities it regulates, enumerate a series of questions that the CPUC should be prepared to consider as it moves forward, and offer a framework for the CPUC to use to demonstrate to the public its progress in achieving its safety goals.

Safety has been the buzzword at CPUC since the September 2010 natural gas transmission pipeline explosion in the Crestmoor neighborhood of San Bruno, just a few miles south of San Francisco. Eight people were killed, ten seriously injured, and the neighborhood left scarred. At the time of this writing, one can still go to Google maps and see the explosion's effects (Box 1 – type "Earl Avenue and Glenview Drive, San Bruno" into the search bar, and choose Satellite View). Images show the remnants of the 38 homes destroyed. Zoom in, and the images show unremarkable houses on unremarkable streets, filled with people with no concerns about what lay below the pavement.

Box 1: Earl Avenue and Glenview Drive, before and after September 9, 2010. Courtesy of Google Maps, accessed July 24, 2013.

The explosion ripped opened the seams of PG&E and CPUC safety programs and activities. Inside PG&E we saw a management culture obsessed with image but pushing cost-cutting without an understanding of the potential life-threatening consequences. Inside the CPUC we saw an agency that took for granted that the corporations it regulates were implementing its orders in a manner that ensured safety and reliability, while the agency focused instead on other policy initiatives.

Recently, a series of revelations have led the public to question how much the safety operations have changed at the CPUC since the San Bruno explosion.

- Following a December 2011 windstorm, the CPUC revealed at a Legislative oversight hearing that it had not been regularly reviewing emergency plans filed by electrical corporations or verifying that ratepayer-funded maintenance programs authorized were actually implemented.

- In January 2013, a Department of Finance audit found the CPUC's budgeting and administration to be grossly deficient, leading to fund misstatements of more than $400 million and an $81 million accounting error due to a typo.

- In March 2013, responding to a request from the California Legislative Analyst, the CPUC initially reported that it oversaw balancing accounts that were authorized at more than $10 trillion—roughly 300 times too high—despite the industries it regulates having only $50 billion annually in revenue. Further investigation found that the CPUC had not submitted audits of the utilities to the Board of Equalization since 1977, despite a statute that requires it. The California State Auditor is currently conducting a review of the PUC's practices with regard to oversight of balancing accounts.

> *Safety: The state in which the risk of harm to persons or property damage is reduced to, and maintained at or below, an acceptable level through a process of hazard identification and risk management. (FAA Order VS-8000.367)*

- In April 2013, questions about the adequacy of the CPUC's response to the San Bruno explosion arose with the uncovering of an independent consultant report that had polled employee opinions regarding the safety culture at the CPUC. Comments from employees included:

  "There has been a lot of lip service to safety. I have not seen enough action yet to back up the talk."

  "There is a disincentive for staff to tackle safety, it would mean taking on more work for myself for no reason and without support."

The report was the topic of oversight hearings by both Assembly Budget Subcommittee #3, chaired by Assemblymember Richard Bloom and Senate Budget Subcommittee #2, chaired by Senator Jim Beall. In response to the questions from the subcommittees, the CPUC produced a gas safety plan and a safety culture status report. This document's deficiencies—outlined later in this paper—raise more concerns.

Perhaps the greatest fault of the reports given to the Legislature was that they only concerned natural gas safety. The San Gabriel Valley windstorm demonstrated the CPUC's failure to oversee the electric utilities' emergency response plans. The public has not seen how the CPUC intends to correct that deficiency. Contrast this with New York's response to the outages caused by Superstorm Sandy in October of 2012: the state's public service commission opened up a rulemaking to develop emergency response metrics within seven months.[2] The Legislature has approved funding for positions at the CPUC for a risk assessment group for rail safety, and the public might wish to know the proposed plan of action for those personnel.

The CPUC is not the first government entity to suffer from systemic problems in administering its safety mandate. The Federal Aviation Administration and its predecessors have undergone periods of

turbulence, and oversight by Congressional committees and subcommittees has played a pivotal role in that organization's continual improvement and the success of the industry it regulates. [3]

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[1] http://abclocal.go.com/kgo/story?section=news/iteam&id=7916887

[2] http://documents.dps.ny.gov/public/MatterManagement/CaseMaster.aspx?MatterCaseNo=13-E-0140

[2] *History of Aviation Safety Oversight in the United States*, U.S. Department of Transportation, Federal Aviation Administration. DOT/FAA/AR-08/39, July 2008. http://www.tc.faa.gov/its/worldpac/techrpt/ar0839.pdf

Commission Priorities Are Not Focused on Safety

The attitudes, decisions and methods of operation at the policy-making level demonstrate the priority given to safety.

- FAA Advisory Circular 150/5200-37, p. 2

An organization expresses its priorities through its use of discretionary resources.

Box 2: Work Products of the Policy and Planning Division

- Low-Income Rate for Water Utility Customers
- Customers as Grid Participants: A Fundamentally New Role for Customers
- A Review of Current Issues with Long-Term Resource Adequacy
- Rethinking the Water Energy Nexus: Moving toward Portfolio Management of the Nexus
- Energy Data Center
- Cybersecurity and the Evolving Role of State Regulation: How it Impacts the California Public Utilities Commission
- Utility Workforce Development: Should the CPUC Play a Role in this Issue?
- Pre-Pay Programs for Electricity Service
- Trends in Utility Infrastructure Financing
- Electricity Use and Income: A Review
- Policy and Planning Division Staff Rate Case Memo
- Universal Service Fund Reform: An Assessment of Potential Challenges and Opportunities
- The Case for Diesel Cars in California
- Implementing a Public Goods Charge for Water
- Advanced Meters: How Customers Benefit
- Electric Energy Storage: An Assessment of Potential Barriers and Opportunities
- Light-duty Vehicle Electrification in California: Potential Barriers and Opportunities

Apart from one commissioner's activities in the gas safety rulemaking and the presence of two commissioners in an adjudicatory role in the San Bruno penalty proceedings, the commissioners have had little involvement in the development of safety policy at the commission.

CPUC staff have created a Safety Council whose mission is "to create and drive the overarching strategies that Commission Management will use for improving public safety,"[4] without direction, guidance, or approval by the Commission.

According to a letter to the NTSB[5], the Safety Council approved the Gas Safety Plan—the plan that was submitted to the Legislature in April of 2013 to outline the CPUC's future gas safety efforts. This was done without involvement of the commissioners.

Contrast this with the development of a proposal and governance structure for the California Energy Systems of the 21st Century (CES-21) project, in which commissioners participated in an all-party meeting to discuss the project, voted on the decision, and insisted that specific proposals come back to them for a full vote as well—rejecting approval at the staff level.

Delegation of the approval of a CPUC gas safety plan to staff is also inconsistent with its own

direction to gas corporations. In submitting the gas corporation's annual safety plan pursuant to SB 705 (Leno, Statutes of 2011), the Commissioners decided that an officer must sign a high-level policy statement attesting that safety can be demonstrated to be the highest priority.[6]

This lack of attention on the part of commissioners may not be due wholly to a lack of understanding or interest. For example, the results of the January 2013 safety culture report were not provided to the commissioners until around the time the document became public in April 2013.

A further indication that safety is not a focus at the CPUC is that it hasn't been a focus of the Policy and Planning Division (PPD), which, according to the CPUC's website, is "charged with identifying and analyzing utility industry issues, internal and external procedures, and interagency relationships…PPD's assignments are different from those of other divisions in that its projects are likely to be more comprehensive in scope, may cross divisional boundaries, and may involve other agencies."

Such a division would appear well-suited to address the policy questions raised by the NTSB, IRP, and safety culture report. Of the 17 independent publications on the division's website, only one (Cybersecurity) deals with safety, though indirectly. The others are related to energy efficiency, renewable energy, water, telecommunication and investing in energy technologies (Box 2). Only one document (Rate Case Plan Memo, May 2012) contains a section that addresses safety directly, containing a discussion on the extent to which safety might be a consideration in future rate cases.

In January 2012 the CPUC held a workshop on

Box 3: Thought Leaders in Essential Industries Speaker Series

September 24, 2013: Energy Consumption Data

April 18, 2013: Energy Consumption Data

Feb. 27, 2013: Cybersecurity

Oct. 26, 2012: Green Economy Partnerships

Aug. 2, 2012: The Internet of Things

March 8, 2012: Revitalizing the Clean Energy Economy

Sept. 20, 2011: The Economic Viability of Energy Storage

July 11, 2011: Lessons Learned: Solar Leadership in Germany and California

March 24, 2011: Advanced Customer Engagement Platforms and Energy Conservation

October 14, 2010: Jacques Besnainou: Clean Energy Park in the San Joaquin Valley

September 22, 2010: Peter Fox-Penner: Smart Power: Climate Change, Smart Grid, and the Future of Utilities

August 12, 2010: Peter Darbee: Climate Change for Policymakers and Business Leaders

July 14, 2010: The Real Cost of Water and the Coming Water Shortage

June 30, 2010: What Role Can Clean Tech and Smart Grid Start-Ups Play in Solving the Climate Change Crisis?

April 8, 2010: Ralph Cavanagh: Energy Efficiency, Clean Energy, and Climate Change Policies

March 5, 2010: Philip D. Moeller: FERC Priorities, Federal Renewable Energy and Climate Change Efforts

January 21, 2010: Carbon Capture and Storage

September 24, 2009: Claude Turmes: European Policies for Renewable Energy, Energy Efficiency, and Climate Change Policies - Lessons Learned

August 27, 2009: Feed-In Tariffs

June 10, 2009: California's Budget Challenge and the California Green Economy

May 21, 2009: Mary Nichols: Creating California's Clean Energy Future

November 6, 2008: Vinod Khosla: Clean Technology and Venture Capital Investments

"System Safety and Security in Ratemaking."[7] This workshop included a straw proposal to improve the ratemaking process to prioritize safety initiatives. The Independent Review Panel into the San Bruno Explosion (IRP) had made recommendations such as the submission of safety audits into rate cases and the more active role of safety staff in those cases. The CPUC's website does not indicate whether it received public comment as a result of this workshop. It does not indicate whether any recommendations from this workshop were adopted by the commission.

In February of 2012 the Assembly Utilities & Commerce committee and the Joint Committee on Emergency Response held an informational hearing on the San Gabriel Valley windstorm, which had created an outage in Southern California Edison's service territory that had led to a service interruption for 440,000, some of whom didn't have power for a week. The Energy Division director had stated during the hearing that incorporating safety into rate case consideration was a high priority for commissioners and executive-level staff and indicated that the January 2012 workshop on the subject would likely lead to a rulemaking, and that the commissioners were committed to resolving the issue.

> *"We can't tell you when a rate case is approved whether or not the amount of money allocated toward reliability and safety is the right amount of money."*
>
> - Energy Division Director Edward Randolph, January 3, 2012

The CPUC's Executive Director required PG&E to hire an independent audit for their 2014 General Rate Case. It is unknown whether the CPUC will be requiring the same or similar of any other entities it regulates, even though Southern California Edison had submitted on July 15, 2013 its notice of intent to file for its next general rate case, which will commence at the beginning of 2014.

Another expression of CPUC priorities is its "Thought Leaders in Essential Industries" speaker series, designed to "stimulate thought and discussion of some of the most pressing challenges facing California utility regulators and the private sector industries impacted by state policies."[8]

Of the twenty-two seminars that have taken place since the end of 2008, nineteen concerned energy (Box 3). Of those, eleven have happened since the San Bruno explosion, and only one has had any connection with safety (that on cybersecurity). One addressed water, and one touched on telecommunications. No events addressed transportation.

If this is a speaker series in "essential industries," clearly the CPUC finds some of the industries it regulates much less essential than others.

The CPUC should identify its discretionary resources and put them to use in high-priority areas, such as safety.

> *"For the past ten years we have been mostly focused on climate changes policies. Everything else takes a back seat. We have not been focused on creating the safest infrastructure."*
>
> -CPUC employee, Business Advantage Consulting report

CPUC Has Not Developed Policy Necessary to Implement Safety

The CPUC has been given direction by the IRP that it commissioned and the National Transportation Safety Board (NTSB) to perform both prescriptive and performance-based actions. As an example of prescriptive direction, NSTB has recommended that pipeline regulators eliminate the "grandfather clause," which had allowed pipe installed prior to 1970 to operate without ever being subject to a pressure test to determine the maximum safe operating pressure. The pipe section that ruptured in San Bruno was one that was installed prior to 1970 and for which no record of a pressure test exists. The CPUC has committed to and is performing the prescriptive elements recommended to it. Neither it nor the utilities have argued against such actions.

The recommendations, however, give the CPUC considerable latitude on how to carry out policy changes. IRP has recommended that the CPUC

> *Adopt as a formal goal, the commitment to move to more performance-based regulatory oversight of utility pipeline safety. (Recommendation 6.2.4.1)*
>
> *Consider a more proactive role for the safety staff in utility rate filings. Improve the interaction between the gas safety organization and the Division of Ratepayer Advocates of the CPUC so there is an enhanced understanding of the costs associated with pipeline safety. (Recommendation 6.8.3.1)*
>
> *Upon thorough analysis of benchmark data, adopt performance standards for pipeline safety and reliability for PG&E, including the possibility of rate incentives and penalties based on achievement of specified levels of performance. (Recommendation 7.4.2)*

The CPUC has yet to complete any of the above recommendations. They are more difficult than prescriptive recommendations, and the CPUC will need to make conscious choices on how to (and even whether to) follow them.

The CPUC's 2012 Natural Gas Safety Plan is an initial attempt to integrate prescriptive and policy elements into a single plan.

The strength of the 2012 Natural Gas Safety Plan is that it recognizes and commits to completing nearly all the recommendations made to the CPUC, as well as other safety actions. Despite this, the plan has numerous deficiencies, which will be presented later in this report. The deficiencies largely stem from a failure to address the policy questions necessary to implement it.

Policy questions that the CPUC should be considering include:

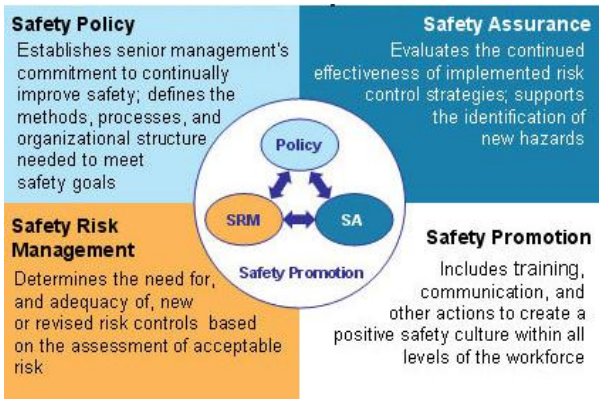
- What are the broad safety management goals of the CPUC?
- How can the CPUC measure success toward achieving its safety management goals?
- What are the safety responsibilities of all CPUC staff, including those whose roles are not primarily involved with safety programs?
- What should the role of safety staff be in rate case filings?
- What should the CPUC's enforcement philosophy be? How should performance-based and compliance-based regulation be integrated?

With these fundamental policy questions answered, the 2012 Natural Gas Safety Plan can be revised and implemented in a manner that will measure the extent to which the CPUC is achieving its safety management goals.

ValuJet: The Federal Aviation Administration's "San Bruno"

The Federal Aviation Administration's (FAA's) "game changer" was the 1996 crash of ValuJet Flight 592 in the Florida Everglades, killing all on board. ValuJet's business model was to operate highly-depreciated aircraft and outsource the maintenance to 3rd parties.[9] The FAA had always had a dual role of both enforcing safety and promoting the industry. According to Mary Schaivo, Department of Transportation Inspector General at the time of the crash, ValuJet had been "a showpiece – unfortunately for the administration at the time – of lowered airfares, what deregulation and what allowing new entrants into the field could do to airfares" and that "instead of hitting them with violations, they were propping them up."[10]

Box 4: Schematic of FAA's Safety Management System



Since the ValuJet crash, FAA has developed agency-wide written guidance on implementation of safety management systems (SMSs). The SMS scheme can be seen in Box 4.[11]

FAA's *safety policy* efforts are advanced through a number of means. The FAA has a long-term strategic plan, *Destination 2025*,[12] supported by annual business plans for each FAA line of business, including aviation safety.[13] Both the long-term and annual plans contain goals, actions the agency intends to take to reach those goals, and metrics by which progress can be measured. All FAA plans include these elements. In addition, FAA produces annual performance reports to demonstrate how well it has achieved its goals.[14]

Also supporting the FAA's safety policy efforts are its safety rulemakings. FAA, like many other regulatory bodies, has throughout its existence struggled with improving the speed of its rulemaking processes. A performance goal for 2013 includes the prioritization of rulemakings.[15]

FAA's *safety risk management* efforts are guided by procedures integrated into decision-making that identify hazards associated with proposed changes, analyze risk, assess the acceptability of such risk, and how to mitigate risks deemed acceptable. The FAA's Air Traffic Organization has an SMS manual that provides guidance for when safety considerations should be used in decision-making and how in-depth any particular analysis need be.[16]

FAA carries out *safety assurance* through a number of methods, including through monitoring, data tracking and analysis, and investigations. Safety assurance monitors the outputs of FAA and regulated entities by analyzing the results of safety reviews, evaluations, audits, and inspections, and by conducting investigations when necessary.

FAA's *safety promotion* is achieved by training all employees on their safety responsibilities, including executives and managers, by presenting safety reports to all staff so that everyone learns their lessons, by encouraging a positive reporting culture, and by providing clear and regular communication of safety policy, goals, and performance to all employees and stakeholders.[17]

While FAA regulates a different industry with different players, the safety policy, risk management, assurance, and promotion efforts briefly described above are essential elements to provide confidence to the public of utility safety and are well within the capability of a committed CPUC.

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[4] Safety Council Charter, May 31, 2013 draft.

[5] Paul Clanon, Letter to NTSB, January 3, 2013, p. 5. http://www.cpuc.ca.gov/NR/rdonlyres/575B54C4-B55C-471B-AE76-BC9C1F4ED560/0/6313LettertoNTSBregardingpipelinesafety.pdf

[6] D.12-12-009, implementing SB 705 (Statutes of 2011), Attachment A, p. 11. http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M039/K604/39604914.PDF

[7] http://www.cpuc.ca.gov/PUC/events/system_safety.htm

[8] http://www.cpuc.ca.gov/PUC/hottopics/7other/081027_thoughtseries.htm

[9] U.S. House of Representatives, Transportation and Infrastructure Committee, Subcommittee on Aviation, Prepared Statement of David R. Hinson, Federal Aviation Administrator, Concerning the FAA's Surveillance and Inspection Program, June 25, 1996. http://testimony.ost.dot.gov/test/pasttest/96test/hinson7.pdf

[10] Interview with Mary E. Schiavo. *Flying Cheap: A Frontline Investigation*. PBS, February 2010. http://www.pbs.org/wgbh/pages/frontline/flyingcheap/interviews/schiavo.html

[11] http://www.faa.gov/about/initiatives/sms/explained/components/

[12] *Destination 2025*, FAA, http://www.faa.gov/about/plans_reports/media/Destination2025.pdf

[13] *Aviation Safety: Fiscal Year 2013 Business Plan*. FAA. December 12, 2012. http://www.faa.gov/about/plans_reports/media/2013/AVS_FY2013_Business-Plan_12-12-10.pdf

[14] *Fiscal Year 2012 Portfolio of Goals, FAA*, http://www.faa.gov/about/plans_reports/media/FY12_POG.pdf, *Fiscal Year 2012 Performance and Accountability Report*, FAA, http://www.faa.gov/about/plans_reports/media/FY2012PAR.pdf

[15] *Aviation Safety: Fiscal Year 2013 Business Plan, p. 2.*

[16] *FAA Safety Management System Manual*. Version 1.1, May 21, 2004. http://atcvantage.com/docs/FAA_ATO_SMSM_v1.1.pdf

[17] FAA Safety Policy Order VS 8000.367, *Aviation Safety (AVS) Safety Management System Requirements*, p. 16. http://www.faa.gov/documentLibrary/media/Order/VS%208000.367.pdf

Risk Management Not Considered in CPUC Business

"In each division there's a different focus—for DRA it's cost, for Energy it's reliability, for Water, it's cost. Safety isn't inherent. Cost first, reliability second, safety is last. We need to change how we think. We need guidelines, we need to revise the mission."

- Anonymous CPUC employee, Business Advantage Consulting

Procedures Lacking to Develop Agenda "Safety Considerations"

When Senator Beall, Chair of Senate Budget Subcommittee #2, asked the CPUC's Executive Director during an oversight hearing on April 25th how many CPUC employees work in safety oversight, the response was "all of them." To engage the entirety of an organization in a single endeavor requires extensive procedural guidance—especially when the endeavor is new. The CPUC does not have sufficient written guidance documents necessary to focus the organization on safety.

Safety Management: an integrated collection of processes, procedures, policies, and programs used to assess, define, and manage the safety risk in the provision of an agency's regulatory service.[18]

For example, the CPUC has added a "safety considerations" field under each item on the CPUC Business Meeting agendas. Staff does not, however, have sufficiently detailed guidance on how to fill these items. This problem is demonstrated in an item on the July 25th, 2013 agenda, which proposes to approve Smart Grid plans of the electric utilities and notes on Safety Considerations indicates that "when deployed, Smart Grid will improve safety and reliability."[19] However, the decision itself does not analyze the electrical corporations' claims that safety is an attribute of their Smart Grid deployment plans.

Safety and reliability is a facet of what the Smart Gird plans are trying to address, as special effort must be made to make a smart grid safe and reliable. For example, on July 1, a software bug caused as many as 3,000 of PG&E's SmartAC units—installed to reduce peak demand by cycling air conditioning on hot days—to fail, preventing air conditioning from turning on in heat that had in places topped 100 degrees.[20] Unfortunately, the success of the utilities' Smart Grid plans will not be determinable, as smart grid plan metrics have not been adopted, though staff had proposed some as early as February of 2010.[21]

The CPUC decision does not render a decision on baseline expectations for cybersecurity or safety. This would imply that the safety description shown in the CPUC agenda is not based on the contents of the decision. This could have important legal consequences. If a "safety consideration" is not based on the record in a proceeding, the Commission is obligated to ignore it, as discussed below.

PUC staff and managers lack the training, time, processes, and management support to effectively identify, analyze, and move forward safety concerns and considerations.

-Business Advantage Consulting

Is this "safety consideration" a "check-the-box" exercise, either because 1) staff do not understand what their responsibilities are in conveying safety information to commissioners, or 2) no one particularly cares what is written in that section?

Perhaps a more useful approach would be to consider safety implications in the scoping of a proceeding and only include a section on safety considerations in the agenda when safety is addressed in a finding of the proposed decision.

In this way, the emphasis would not be on discovering how a decision, already written, affects safety, but how and in which instances the public process for developing those decisions is informed by safety considerations.

CPUC Decisions Do Not Always Develop Findings Related to Safety

In order for a CPUC decision to be lawful, it must be made based on findings that have been informed by a record developed in a proceeding.[22] The tool that the CPUC uses to develop a record is the scoping memo,[23] which determines the topics to be addressed in the proceeding (or phase thereof), outlines the schedule of activities, and often poses questions for parties to consider and file comments on.

To understand the importance of the scoping memo, one only need look at the March 2012 court of appeals decision to overturn the CPUC's approval of ratepayer funding of PG&E's Oakley power plant. The court had determined that the conditions of approval were outside the scope of the proceeding.[24]

There are no existing mechanisms for inserting safety concerns into the record. Often, when safety is considered in a case proceeding it is at the end of the process, when it is too late to make necessary changes.

-Business Advantage Consulting

Proceedings are scoped either in orders that are voted on, such as an order to institute a proceeding, or in rulings by the assigned commissioner. For this reason, safety cannot be delegated to a staff division; the decision as to whether to consider safety comes directly from the commissioners.

Procedures Lacking In Scoping Safety into Proceedings

Consider, as another example, the CPUC's recent proposal[25] to create procurement targets for energy storage. The ruling makes no mention of safety, despite the clear safety implications of concentrating energy in small spaces for extended periods of time. A study by Sandia National Laboratories, aimed at state regulators, raises the safety concerns of energy storage, noting that "flywheel storage uses a heavy spinning mass that could cause severe injury in the case of failure; pumped hydroelectric plants use upper reservoirs, which could result in dangerous flooding if they were to break; and the chemicals and

reactions used in batteries can pose safety or fire concerns."[26] Box 5 lists recent safety-related incidents involving energy storage.

The CPUC might, for instance, wish to ask electric utilities to perform outreach with local first responders to prepare them for hazards inherent in the storage facilities installed in the California's local jurisdictions.

The State Fire Marshal, General Motors, and Nissan, for instance, have produced emergency response guides for first responders to accidents involving electric vehicles[27] in general, and Chevy Volts and Nissan Leafs specifically.[28] At minimum, however, the ruling—which already asks parties to respond to ten questions—could ask whether the procurement of storage resources raise any safety concerns.

In the two and a half years since the opening of the energy storage proceeding (which was initiated three months after the explosion in San Bruno), no rulings, scoping memos, or staff reports mention or assess potential safety implications. The October 17th decision,[29] which would require a multi-billion dollar investment for procuring over 1.3 gigawatts of energy storage, makes no safety-related findings, and only uses the word "safety" in the context of a "safety valve" which would allow for less procurement in the presence of excessive costs. The "safety considerations" field in the agenda does not refer to safety but states, "inclusion of energy storage in California's energy resource portfolio will assist in grid reliability and potentially reduce the need to construct some generation facilities."[30]

Box 5: Recent Energy Storage Safety Incidents

May 2011: The lithium-ion battery in a Chevy Volt spontaneously catches fire 3 weeks after undergoing a crash test. The National Highway Traffic Safety Administration, while stating its belief that the Volt and other electric cars are no more or less prone to fires following crashes, undertakes a comprehensive study on the risk of lithium-ion batteries in plug-in electric vehicles.

September 2011: Sodium-sulfur batteries at a Mitsubishi Materials Corporation plant in Japan catch fire. Firefighters require more than eight hours to control the blaze, and authorities can only declare it extinguished days later. The burning battery modules were so hot they had to be completely covered in sand. The manufacturer recalls all of its sodium-sulfur batteries, and PG&E nearly scraps its Yerba Buena system in San Jose, as it was also based on sodium-sulfur batteries.

October 2011: A 20MW flywheel energy storage facility in Stephentown, NY suffers the second of two flywheel explosions. The first had been in July, two weeks after the facility had come online.

August 2012: A 15MW battery system attached to the Kahuku Wind Farm near Honolulu, HI catches fire. Fire crews could not enter the building housing the battery until seven hours after the fire had started due to concerns of chemical fumes. The battery system had had two previous fires since it came online in March 2011.

November 2012: An electrical fire in a 1.5MW lithium-ion battery solar energy storage system near Flagstaff, AZ causes $3 million in damage.

January 2013: A battery overheated and started a fire in an empty Boeing 787 "Dreamliner" at Boston's Logan International Airport, which led to a grounding of all 787s in the United States for four months.

It must be remembered that "safety" issues have broader implications. Battery recalls affect project costs and schedules, and the battery fire in the Tesla Model S on October 1, 2013 preceded a roughly 10% drop in share price over the next two days. The local fire department had found the fire difficult to extinguish, and Tesla is having similar difficulty with the news story.[31] Additionally, if one does not consider risk, one cannot allocate it, which tends to mean that it is borne by ratepayers.

The CPUC should consider including a comprehensive review of safety in all of its proceedings and rulings—starting with proceeding scoping—to ensure that safety is a standard consideration in all CPUC activities.

Though CPUC Has Developed High-Level Guidance, It Has Not Been Widely Implemented

Many at the CPUC understand the importance of scoping safety into proceedings if decisions are to be informed by safety. In December the Chief Administrative Law Judge (ALJ) sent an email to all ALJs, division directors, and the CPUC's executive director on the consideration safety in both matters where the record is closed and in matters where the record remains open. As can be seen in the above examples, however, this high-level direction has not always been followed. Part of the reason is that the divisions do not appear to have implemented the guidance by performing any formal analysis of hazards, risk factors, and mitigations for their industries, analyses that could aid in proceeding scoping. Part of the problem, however, may be that emails are transient and not widely accessible (this particular one retained the boilerplate admonition that the contents may include privileged and confidential information).

It is not clear, however, that the Chief ALJ had any better option than email, as the CPUC does not appear to have manuals or other means of organization where such guidance may be kept and referenced.

FAA Approach to Incorporating Safety into Decision-Making[32]

FAA's Air Traffic Organization evaluates all new procedures and operations for safety risk. If a proposed change is thought to reasonably affect safety, a safety risk assessment is conducted. Management ultimately decides whether or not to conduct a risk assessment. If so, staff identifies hazards, analyze risk using the severity and likelihood of the hazard, rank and prioritize the hazards, and if the risk is not deemed to be acceptable, staff treat the risk through design, incorporation of safety devices, appropriate warnings, or development of procedures and training. A schematic of the safety risk management flow chart can be seen in Box 6.

In order for the CPUC to consider risk in its decisions—as the use of a "safety considerations" field in agenda items indicates—it will have to incorporate some version of a risk management process into the scoping of its proceedings. The process, once understood, need not be onerous. In order for staff to understand their responsibilities, the CPUC will need to develop—or have a consultant help develop—written documentation of the process.

CPUC Should Emulate Safety Division's Procedures for Gas Citations in Decision-Making

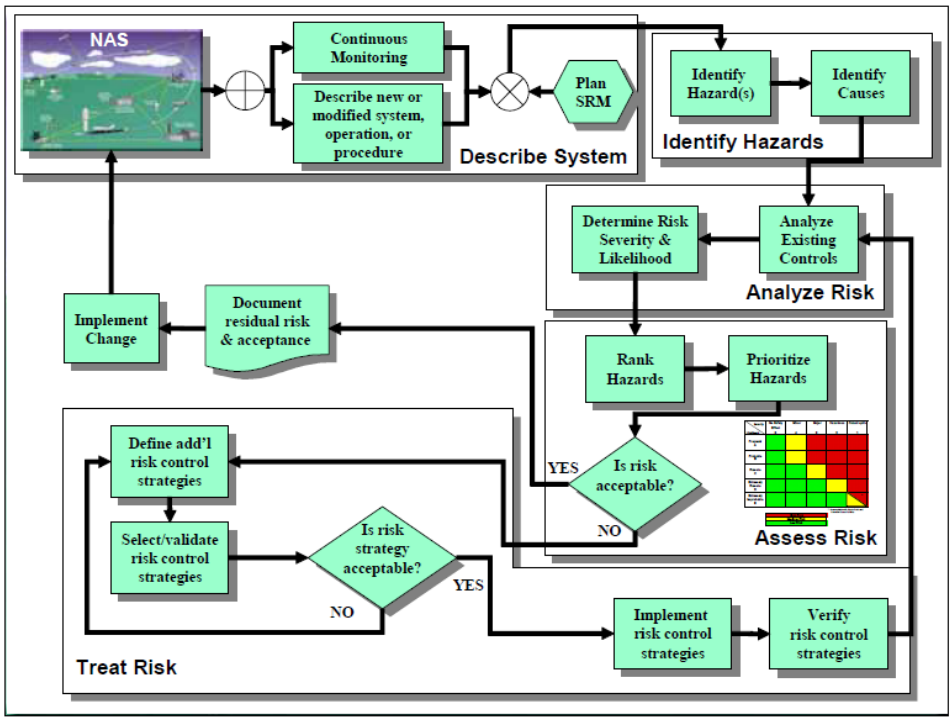
Over the past several years, the CPUC has asked for and received from the Legislature ten positions for risk assessment—six for gas safety and four for rail safety. The CPUC's request was largely based on advice from the IRP, who stated in one of its recommendations (6.6.3.1),

> *"The CPUC should significantly upgrade its expertise in the analytical skills necessary for state-of-the-art quality risk management work. The CPUC should have an organizational structure for individuals doing this work such that they have an equal stature and access to management of the CPUC as those who deal with rate issues or legal or political issues."*[33]

The gas risk assessment unit has developed a guidance to explain the basis by which it will assess fines.[34] The creation of such a document—offering guidance to the regulated while setting expectations for the conduct of the regulator—is perhaps the only guidance document outside of an email from the Chief ALJ that addresses how the CPUC will manage risk. At its core is a "risk matrix"—a conceptual tool that combines the probability and consequence of a particular hazard occurring to determine is public safety risk. While the document is only a framework, and many details need to be worked out concerning the assignment of hazards to risk levels, it is the best start that the CPUC has made in managing risk.

As positive as the document is, one may question whether it is directed at the CPUC's most important safety priorities. The only candidates thus far identified for citation have been self-reported violations by the utilities themselves. In light of the discussion above, the CPUC might wonder if the appropriate fining of utilities for the self-report of compliance violations is the most pressing need for risk management. The gas and rail risk management units, however, are buried deep in the organization chart of the Safety and Enforcement Division, and have not been able to bring their risk assessment tools to bear on CPUC decision-making.

Box 6: FAA Safety Risk Management Flow Chart



[18] Federal Aviation Administration Safety Management System Manual, Version 1.1, May 21, 2004, p. 8. http://atcvantage.com/docs/FAA_ATO_SMSM_v1.1.pdf.

[19] Item 3, https://ia.cpuc.ca.gov/agendadocs/3318.pdf

[20] David R. Baker, "PG&E's SmartAC Program Malfunctions," *San Francisco Chronicle*, July 19, 2013. http://www.sfchronicle.com/business/article/PG-amp-E-s-SmartAC-program-malfunctions-4673820.php

[21] "Assigned Commissioner and Administrative Law Judge's Joint Ruling Amending Scoping Memo and Inviting Comments on Proposed Policies and Findings Pertaining to the Smart Grid." R.08-12-009. February 8, 2010, Attachment C. http://docs.cpuc.ca.gov/PublishedDocs/EFILE/RULINGS/113482.PDF

[22] Public Utilities Code §1757, §1757.1.

[23] PUC §1701.1(b).

[24] *The Utility Reform Network v. CPUC* (2012) WL 105938 (Cal.App. 1st Dist.), http://www.leagle.com/decision/In%20CACO%2020120316017

[25] "Assigned Commissioner's Ruling Proposing Storage Procurement Targets and Mechanisms and Noticing All-Party Meeting," R.10-12-007, June 10, 2013. http://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M065/K706/65706057.PDF

[26] Dhruv Bhatnagar and Verne Loose, *Evaluating Utility Procured Electric Energy Storage Resources: A Perspective for State Electric Utility Regulators*. Sandia National Laboratories, SAND2012-9422, November 2012, p. 53. http://www.sandia.gov/ess/publications/SAND2012-9422.pdf

[27] http://osfm.fire.ca.gov/training/alternativefuelvehicles.php

[28] http://www.evsafetytraining.org/~/media/Electric%20Vehicle/Files/PDFs/VoltRespondersGuide.pdf, http://www.nissan-techinfo.com/refgh0v/og/FRG/2011-Nissan-LEAF-FRG.pdf

[29] Proposed Decision of Commissioner Peterman, "Decision Adopting Energy Storage Procurement Framework and Design Program." R.10-12-007, Sepember 3, 2013. http://docs.cpuc.ca.gov/SearchRes.aspx?docformat=ALL&DocID=76387883

[30] Item 29, p. 30. https://ia.cpuc.ca.gov/agendadocs/3324.pdf

[31] Bill Vlasic, "Car Fire a Test for High-Flying Tesla," New York Times, October 3, 2013. http://www.nytimes.com/2013/10/04/business/car-fire-a-test-for-high-flying-tesla.html?src=recg

[32] *FAA Safety Management System Manual*. Version 1.1, May 21, 2004. http://atcvantage.com/docs/FAA_ATO_SMSM_v1.1.pdf

[33] Report of the Independent Review Panel: San Bruno Explosion (revised copy), June 24, 2011, p 101. http://www.cpuc.ca.gov/NR/rdonlyres/85E17CDA-7CE2-4D2D-93BA-B95D25CF98B2/0/cpucfinalreportrevised62411.pdf

[34] Gas Safety Citation Program Standard Operating Procedure, Version 1.0, September 20, 2013. http://www.cpuc.ca.gov/PUC/safety/Pipeline/Standard_Operating_Procedure_for_Citations.htm

Genuine Efforts Hampered By Failure to Plan and Organize for Success

To move to a regulatory model based on performance and effectiveness will require a shift in the mindset of the entire agency and will require courage and innovation to implement.

- Report of the Independent Review Panel, June 24, 2013

Defining Safety Goals

The first step in developing a strategy for safety is to clearly articulate safety goals. The CPUC has stated on numerous occasions—including in its Gas Safety Plan—that its goals for gas safety are four:

1. Ensure the safety of the existing natural gas pipeline infrastructure
2. Upgrade and replace the existing natural gas pipeline infrastructure to improve safety
3. Reform the CPUC to make safety its first priority
4. Instill a safety culture in the natural gas pipeline operators

The CPUC appears to be hampered in its ability to implement these goals in because of an apparent lack of an understanding of what safety is in context of utility and CPUC operations. Three of the four goals require a common understanding between the CPUC and the gas utilities. That understanding does not appear to exist.

At the CPUC's direction, Liberty Consulting performed an independent review of capital and operations and maintenance expenditures proposed by PG&E in its General Rate Case (GRC) filing, insofar as they address safety and security initiatives by its Power Generation and Electric Operations lines of business. The May 2013 assessment noted that:

> *"PG&E lacks a defined and articulated philosophy of risk. This gap creates an impediment to reaching a common understanding between the utility and its stakeholders, particularly the Commission.*
>
> *The lack of a mutually agreeable definition of 'safety project' creates another impediment to the fulfillment of the CPUC expectations."*

> *"If you are promoting safety, you have to have mechanisms for implementing safety strategies and evaluating them. You must have an auditing mechanism."*
>
> - Anonymous CPUC employee, Business Advantage Consulting

The lack of an understanding of what safety is follows from the CPUC's a lack of measurable goals.

Regulation by Performance

Once the CPUC develops a common understanding of its safety responsibilities, it will need to develop procedures to determine how well it is fulfilling those responsibilities.

Following the gas pipeline explosion in San Bruno, the NTSB found:

"The NTSB also concludes that because PG&E, as the operator of its pipeline system, and the

Box 7: GAO's Government Performance and Results Act Annual Plan Guidance

Opportunities to improve the usefulness of annual plans	**Applied Practices**
Better articulate a results orientation.	1. Create a set of performance goals and measures that address important dimensions of program performance and balances competing priorities. 2. Use intermediate goals and measures to show progress or contribution to intended goals. 3. Include explanatory information on the goals and measures. 4. Develop performance goals to address mission-critical management problems. 5. Show baseline and trend data for past performance. 6. Identify projected target levels of performance for multiyear goals. 7. Link the goals of component organizations to departmental strategic goals.
Coordinate cross-cutting programs.	8. Identify programs that contribute to the same or similar results. 9. Set complementary performance goals to show how differing program strategies are mutually reinforcing and establish common or complementary performance measures, as appropriate. 10. Describe—briefly or refer to a second document—planned coordination strategies.
Show how strategies will be used to achieve goals.	11. Link strategies and programs to specific performance goals and describe how they will contribute to the achievement of those goals. 12. Describe strategies to leverage or mitigate the effects of external factors on the accomplishment of performance goals. 13. Discuss strategies to resolve mission-critical management problems. 14. Discuss—briefly or in a separate document—plans to ensure that mission-critical processes and information systems function properly and are secure.
Show performance consequences of budget and other resource decisions.	15. Show how budgetary resources relate to the achievement of performance goals. 16. Discuss—briefly and refer to the agency capital plan—how proposed capital assets (specifically information technology investments) will continue achieving performance goals. 17. Discuss—briefly or refer to a separate plan—how the agency will use its human capital to help achieve performance goals.
Build the capacity to gather and use performance information.	18. Identify internal and external sources for data. 19. Describe efforts to verify and validate performance data. 20. Identify actions to compensate for unavailable or low-quality data. 21. Discuss implications of data limitations for assessing performance.

> *CPUC, as the pipeline safety regulator within the state of California, have not incorporated the use of effective and meaningful metrics as part of their performance-based pipeline safety management programs, neither PG&E nor the CPUC is able to effectively evaluate or assess the integrity of PG&E's pipeline system."*[35]

Since the 1990's, agencies of the federal government have implemented the Government Performance and Results Act (GPRA) of 1993, which required federal agencies to:

1. Develop 5-year strategic plans
2. Prepare annual performance plans that outline the goals to be met and method of assessing success toward them
3. Report on the success or failure to meet performance goals from the previous year

GAO further articulated methods by which an agency may meet the challenge presented by GPRA in a series of publications. A summary of suggested best practices can be found in Box 7, reproduced from [36]. GAO has questioned the ability of the federal pipeline regulator to measure performance as well (Box 8). As seen in the previous sections, FAA follows the GRPA guidelines through its use of strategic plans, annual business plans, and annual performance reports.

Common among the GAO, NTSB, and GRPA is the need to connect actions to goals through measurement. The CPUC's Natural Gas Safety Plan, as well as its less-developed set of safety culture actions, is lacking this connection. Unlike in enterprises where the performance measures are self-evident, such as dollars earned, widgets produced, or customers served, it will be more difficult for the CPUC to know if the outcome of "safety" is achieved. The CPUC will need to consciously identify its

Box 8: GAO Identifies Federal Pipeline Regulator's Performance Woes

The federal Office of Pipeline Safety (OPS) suffered major setbacks at the turn of the century. A gasoline pipeline ruptured in Bellingham, WA in June of 1999, killing three, including two ten year-old boys who were playing on the bank of the Whatcom River when the gasoline riding on top of it ignited. In August of 2000 a gas pipeline attached to a bridge in Carlsbad, NM exploded and killed twelve people who were camping underneath it. These two events precipitated the integrity management rules and led to OPS changing its enforcement posture from one of a "partnership" in safety with the regulated operators to one of "tough but fair," in which it began to levy more civil penalties. The Governmental Accountability Office (GAO), however, found that

> *"Although in recent years OPS has made a number of changes in its enforcement strategy that have the potential to improve pipeline safety, the effectiveness of this strategy cannot currently be determined because the agency has not incorporated three key elements of effective program management—clear program goals, a well-defined strategy for achieving those goals, and performance measures linked to the program goals. Without these three key elements, OPS cannot determine whether recent and planned changes in its enforcement strategy are having or will have the desired effects on pipeline safety."*

- GAO, *Pipeline Safety: Management of the Office of Pipeline Safety's Enforcement Program Needs Further Strengthening*. 2004

goals, actions, and metrics.

The lack of planning at the CPUC is not restricted to safety. Pursuant to Public Utilities Code 321.6, the CPUC is supposed to submit an annual workplan to the Governor and Legislature which "describes in clear detail the scheduled ratemaking proceedings and other decisions that may be considered by the commission during the calendar year." The CPUC publishes an "annual report and work plan," but if it fulfills the requirements of 321.6, it only does so minimally.

The CPUC might wish to develop and publish a safety strategic plan for its entire organization, including specific plans for each industry the CPUC regulates.

CPUC Doesn't Have the Organization Necessary to Follow Up on Its Decisions

When Southern California Edison's 2012 general rate case began, the CPUC had not developed any formal means to consider safety explicitly. Despite this weakness and spurred in large part by the San Gabriel Valley windstorm that had revealed weaknesses in Edison's pole loading and emergency response practices, the utilities and parties spent a great deal of effort addressing safety, as is reflected in the ordering paragraphs of the decision.

Ordering paragraphs (OPs) are how the CPUC exercises its authority. Findings are developed in the record of a proceeding, conclusions of law are identified, and OPs order the entities under the CPUC's jurisdiction (and sometimes its own divisions) to undertake actions based on the findings and conclusions.

Some of the ordering paragraphs in the Edison general rate case are clearly beneficial. OPs 9 and 20 require Edison to submit safety-related reports in its next rate case application. This allows this information to be added directly to the record, which can facilitate developing the findings that are necessary to legally consider safety in a decision.

Regardless of the success the CPUC is able to achieve in sending reports to the right places, it will still need to figure out how to process those reports to develop well-considered findings in the service of safety. Other OPs—both in the Edison general rate case and in the settlement agreements for the 2007 Malibu Canyon Fire[37]—order the utility to report study results to the Safety and Enforcement Division, which will require the CPUC to confront a long-standing challenge: how to process reporting. IRP member Paula Rosput Reynolds articulated at the June 9, 2011 business meeting the panel's reservations to the addition of additional reporting:

> *"Lots of reporting requirements for PG&E have been recommended by the judge—I believe approved in the case—and one of the things we say in our report is, it's not clear that more reporting per se is the answer—I mean it ends up creating this sort of paperwork cycle you don't have the resources and staff to read the submissions that you've got today"*[38]

IRP's report states:

> *"The CPUC also does not require or receive information from the operators about their reasoning for why proposed risk management alternatives pertaining to public health and safety risks are*

> *the best of available alternatives or at least good alternatives compared to the other alternatives that could have been proposed. The new reporting requirements that are contemplated or have been ordered in the various recent and ongoing proceedings would not materially change the quality of PG&E's analysis of alternatives."*[39]

Reporting has been an issue for the CPUC in the past. During the February 3, 2012 Legislative hearing on the San Gabriel Valley windstorms, the safety division's acting director had stated that the quality of organization and readability of the utility's safety plans had been lacking, and suggested that they had not been reviewed by the CPUC with any vigor.[40]

Limited resources, as IRP suggests, undoubtedly have contributed to the CPUC's regulatory lapses, but so has a lack of organization. The CPUC has no way to keep track of its ordering paragraphs (or, as the Legislative Analyst's Office has discovered, its statutory audit and audit reporting requirements or the utilities' balancing accounts).[41] During the relatively quiet September 19th business meeting, the CPUC approved 210 separate orders in 31 decisions and resolutions.[42] With one or two business meetings each month, the CPUC will approve several thousands of orders in a year without a system for keeping track of them. It should not be surprising that the CPUC has been caught off guard as to what its responsibilities are.

CPUC Cannot Analyze Risk because it Does Not Organize Investigations and Audits

During a Senate Budget Subcommittee #2 oversight hearing on April 25th, 2013, Subcommittee Chair Senator Beall asked a series of questions regarding the numbers and types of safety inspections performed by the CPUC, but the CPUC Executive Director could not answer these questions, as the information has not been organized into a report that management can understand.

The CPUC has in the past collected this type of information for gas and electric safety into a report. Gas and Electric Safety Reports had been published by the CPUC almost every year since 1997, but the CPUC has not filed gas or electric safety reports for years after 2009.[43] When IRP examined the CPUC, it found that the regulator had not organized data sufficiently to baseline utility performance, let alone analyze that data.[44] The lack of reports over the last several years suggests that this remains a problem.

Poor organization and lack of guidance to staff at the CPUC has been cited elsewhere, most recently by the Bureau of State Audits in its report on intervenor compensation in which the auditor states:

> *"The commission has not issued guidance to its staff or to the utilities on how to calculate interest appropriately for intervenor claims, resulting in differing methodologies and the overpayment of interest… This lack of formal guidance has led the commission to employ a flawed interest computation methodology, resulting in miscalculations and, ultimately, overpayments of interest on awards."*

and

> *"We expected that, to avoid awarding interest, the commission would maintain an accurate database to effectively track when it must issue compensation decisions. However, that was not the case."*

and

> *"State law prohibits intervenors representing the interests of small commercial customers who receive bundled electric service from electrical corporations from receiving compensation if the intervenors have conflicts arising from prior representation before the commission. However, in our review, we learned that the commission lacks a process to ensure that it does not compensate intervenors that may have this type of conflict"*

The CPUC might consider in what other areas of its regulatory practice could be better informed by improved procedures and guidance to staff.

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[35] National Transportation Safety Board. **2011**. *Pacific Gas and Electric Company Natural Gas Transmission Pipeline Rupture and Fire, San Bruno, California, September 9, 2010*. Pipeline Accident Report NTSB/PAR-11/01. Washington, DC., p. 122.

[36] US General Accounting Office, *Agency Performance Plans: Examples of Practices That Can Improve Usefulness to Decisionmakers*. GAO/GGS/AIMD-99-69, Washington, D.C., February 1999, p. 3. http://www.gao.gov/products/GGD/AIMD-99-69

[37] http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M076/K996/76996747.PDF and http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M028/K220/28220927.PDF

[38] http://streaming.aanet.org/ramgen/cpuc/smil/CPUC_OM060911-Spec0.smil, minute 24:25.

[39] IRP p. 100.

[40] Joint Hearing of the Assembly Utilities & Commerce Committee and the Joint Select Committee on Emergency Response, February 3, 2012. http://www.livestream.com/asmdc/video?clipId=pla_c4893d8b-9d02-438e-b9cb-33925e2e28b7 (2:00 hr)

[41] Agenda, Assembly Budget Subcommittee #3 on Resources and Transportation, March 6, 2013. http://abgt.assembly.ca.gov/sites/abgt.assembly.ca.gov/files/March%206%20-%20CPUC%20Oversight%20hearing.pdf

[42] http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M077/K154/77154269.PDF

[43] http://www.cpuc.ca.gov/PUC/safety/Electric/120308_Electricity+Reports+and+Audits.htm, and http://www.cpuc.ca.gov/PUC/safety/Pipeline/Pipeline+Reports.htm.

[44] IRP p. 95.

The Enforcement Program Has Not Developed

Ronald Reagan famously said, "Trust, but verify." For government to do its job - safeguard the public - it cannot trust alone. It must verify through effective oversight…. And, where trust is not merited, make sure the penalty is high. Because, when there's an accident like the one in San Bruno, it is too late.

- NTSB Chair Deborah Hersman in her closing statement, San Bruno investigation, August 30, 2011[45]

Development of an Enforcement Philosophy

The enforcement philosophy at the CPUC needs to be developed, written down, communicated, and integrated into the CPUC's regulatory function.

In developing a philosophy, the CPUC might decide to punish utilities for allowing accidents to happen, favoring high fines and without a great deal of discrimination between accidents where the utility is directly at fault—such as failure to detect corrosion on its pipes—and accidents where the utility is only indirectly at fault—such as the failure of a damage prevention program to prevent a third-party from damaging one of the utility's pipes.

Alternatively, the CPUC might take an active role in accident prevention by choosing to focus on corrective action orders from field inspections and only use fines sparingly or do so with low dollar amounts.

The first philosophy might focus on the overarching goals of fewer reportable incidents or fewer serious incidents (defined by fatalities and serious injury). The second might concentrate on more intermediate goals, such as fewer safety conditions discovered in field audits.[46] The choice of an enforcement philosophy would depend on the extent of the CPUC's resources and the skills of its staff.

Whatever enforcement philosophy the CPUC chooses, it should articulate its goals, its proposed actions to meet those goals, and the metrics by which it may judge its progress.

It is also important to recognize that the regulated entities need to know the standards of enforcement that they will be subject to so to facilitate a common understanding of the goals.

Glacial Speed of Some Investigations

The FAA spent a considerable period of its history evolving its safety standards and programs based on the results of accident investigations. It is not clear how the CPUC has used the results of its own accident investigations to inform the development of its safety programs, or those of the utilities that it regulates. The length of time required to complete some investigations (including those that involve fatalities) combined with the similar slowness of annual safety reports suggests a low priority for the results contained within the finished investigations (see Box 9). The CPUC should ensure that the results from investigations are integrated into their risk-informed oversight.

Statute allows the CPUC discretion in which accidents it chooses to investigate. The CPUC has in the past chosen to investigate every gas and electric accident reported to it by the utilities in its jurisdiction.

Box 9: Long Safety Investigations: the Deaths of Enrique Tello and the Vego Family

Public Utilities Code Section 315 requires the CPUC to investigate accidents on utility property "resulting in loss of life or injury to person or property."

On April 20, 2012, Enrique Tello came into contact with a downed power line in front of his San Mateo home and was electrocuted. Media reports cite different circumstances. One report says that he was driving by in his pickup truck when he stopped to pick up and move the downed line. Another states that he was sitting in his home when he heard an explosion, walked outside, and was electrocuted when he approached his truck, which was energized by the fallen line. Early reports stated that the wire may have become dislodged due to an arc caused by a Mylar balloon, but other reports seem to discount this possibility.

On January 14, 2011, Steven Vego, Sharon Vego, and her adult son Jonathon Cole were killed when they came into contact with a downed power line in their San Bernardino backyard as their children Kayli and Steven Jr. watched from inside the house.

CPUC staff has indicated that neither investigation has yet been completed.

This has led to the CPUC perform many investigations do not appear to inform their oversight. The CPUC might consider not performing investigations on those accidents over which it has minimal jurisdiction, such as cars running into power poles, and those in which an entity such as CalOSHA is already performing an investigation, such as accidents involving linemen slipping and falling from those poles. While information from these accidents should be of interest to the Safety and Enforcement Division (for instance the time needed for the utility to respond to an accident), the division should be able use investigation reports produced by others to inform its own oversight instead of duplicating the work. Division staff are already contemplating such a change.

The CPUC should determine a goal for the time required to perform investigations and monitor its success in reaching that goal. Investigations that last longer than a year and a half to two years should not be tolerated.

Lack of Follow-Up on Inspections

The CPUC is moving forward on developing enforcement procedures without goals, measures, or a clearly articulated philosophy of enforcement. This is especially clear in the CPUC's use—or lack of use—of gas safety audits.

After the 1996 ValuJet crash, Department of Transportation Inspector General Mary Schaivo testified before Congress that the FAA inspections had not been effectively targeted inspections, were carried out in rushed and unsystematic ways, were unrealistic as they were always announced in advance, and did not record all violations so the violations could not be tracked. Schaivo contrasted FAA processes against those of effective inspection organizations (Box 10).[47]

The CPUC's Gas Safety Plan recognizes the need to perform audits recommended by NTSB. The plan does not, however, consider how to use the audits to improve safety. It is not clear, for example, how the CPUC is to follow-up to make sure violations identified in the audit are corrected, or how the CPUC should deal with situations when a utility disagrees with audit findings. Both of these situations are evident in looking at the audits of PG&E performed to date and PG&E's responses to those audits,

accessible on the CPUC's website.[48] For example, PG&E, in response to CPUC findings of violation in PG&E's risk assessment program, makes statements such as:

> *"PG&E believes it is compliant with 192.917(e). The CPSD misquotes 192.917(e)(3)."*
>
> *"PG&E believes it meets the intent of 49 CFR §§ 192.917(e)(3) and 192.917(e)(4)."*
>
> *"PG&E is in compliance with §192.917 (e)(1)."*

The CPUC does not appear to have evaluated PG&E's responses from any of the NTSB-recommended audits, despite the fact that, for some of the audits, it has had a year to do so. Response evaluations should be formal and prompt.

The CPUC should develop protocols for the evaluation of utility audit responses and follow-through to ensure safety-related lapses, that are identified, are corrected.

The NTSB had found this to be a weakness in the CPUC before the explosion in San Bruno:

> *"Another concern is the fact that the CPUC did not follow up on its 2005 audit finding that PG&E lacked a process to evaluate the use of ASVs and RCVs… Although PG&E prepared a memorandum, dated June 14, 2006, addressing this issue, the CPUC apparently did not evaluate the adequacy of this response. If it did, it failed to identify the flawed analysis that concluded the use of ASVs would have little effect on increasing safety or protecting property."*

Box 10: Seven Basic Attributes of Effective Inspections Organizations

1. They have an inventory of the entities they are responsible for overseeing.

2. They have a process for targeting high-risk activities.

3. They have well-defined inspection requirements that include critical items to be reviewed.

4. They have documentation showing what was inspected and the results of the inspection.

5. They have a system for communicating identified problems to the entity inspected.

6. They have a system to record, track, and follow-up on needed corrective actions.

7. They have a process to periodically analyze the results of the inspections to identify problems that need to be addressed systematically.

The NTSB evaluates and posts publically an evaluation of the responses to its recommendations. If the CPUC has evaluated PG&E's responses to any of the audits it has conducted in 2011 and 2012, it has not posted them, and should.

The CPUC might also consider widening the scope of its audits of the utilities. Gas safety audits to date have focused on compliance with the gas safety general order (and federal regulations referenced therein) and on those areas recommended by NTSB in recommendation P-11-22.[49] The CPUC has issued other orders in the gas safety rulemaking (R.11-02-019)—such as to pressure test or replace pipe without records to demonstrate a previous pressure test—and the CPUC may wish to engage in formal audits of these activities.[*] The need can be seen in the recent problems with PG&E's MAOP validation

[*] IRP had suggested that CPUC staff might not have the technical knowledge to perform audits of PG&E's hydrostatic testing program in the near-term, and so might need to retain industry experts (p. 90, 91).

work in San Carlos, where the utility had records that had indicated a greater strength seam weld than was actually in the ground.[50]

The lack of a system to track orders, however, will continue to stymie CPUC efforts to conduct necessary audits of the utilities.

CPUC is Not Considering All the Tools at its Disposal

In January 2012, CPUC levied a $16.7 million fine against PG&E for failing to do leak surveys on 14 miles of distribution pipe for up to two decades, because the utility had misplaced maps. More than a year and a half later the CPUC held a two-day workshop on utility self-reporting of violations and of the risk-based assessment of fines.

CPUC staff is developing potentially powerful risk-based analytic tools, but the potential of those tools is being ignored outside of the compliance function. This is in direct contrast to efforts in other states. The New York Public Service Commission (NYPSC), unlike the CPUC, has safety staff provide testimony in rate cases.[51] For a number of utilities, NYPSC has used rates cases to set performance standards, with provisions for rate penalties for failure to achieve specified levels or performance.[52]

Washington Utilities and Transportation Commission (WUTC) has a commission-approved policy statement concerning the replacement of pipe with elevated risk, which includes principles for cost recovery.[53] This policy was precipitated by accidents nationwide and a 2008 explosion in Odessa, WA involving Aldyl-A plastic pipe. Contrast this with the CPUC, which has not yet acted on the IRP recommendation to adopt, "as a formal goal," to move toward more performance-based regulatory oversight of utility pipeline safety. A formal goal needs to be written, and it needs to be approved by a vote of the commissioners.

FAA, as we have seen, uses risk data from audits and investigations to inform and prioritize its rulemaking process.

CPUC Should Further Develop Safety Its Enforcement Programs Before Seeking Greater Authority

For the past few years the CPUC has pursued legislation to expand its regulatory authority to excavation contractors, as third-party damage during excavation is the largest source of gas distribution pipeline accidents. This priority can be found in the Gas Safety Plan, as it is mentioned in six separate sections.

Given the stage of development of the safety enforcement programs under the CPUC's current jurisdiction, the CPUC might consider whether it is prepared to develop citation programs for the large and complicated universe of excavation contractors, and whether Legislature would be willing to grant such an expansion in authority without knowing how the CPUC intends to use it.

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[45] http://www.ntsb.gov/news/speeches/hersman/daph110830c.html

[46] Use of inspectors in state service, who are unionized and do not have a financial interest, will help mitigate the problem of incentives influencing performance measurement, but so can the use of multiple measures of varying subjectivity.

[47] *History of Aviation Safety Oversight in the United States*, U.S. Department of Transportation, Federal Aviation Administration. DOT/FAA/AR-08/39, July 2008, p. 28. http://www.tc.faa.gov/its/worldpac/techrpt/ar0839.pdf

[48] The posting of audits and utility responses had been included in IRP Recommendation 6.3.3.6.

[49] "With assistance from the Pipeline and Hazardous Materials Safety Administration, conduct a comprehensive audit of all aspects of Pacific Gas and Electric Company operations, including control room operations, emergency planning, record-keeping, performance-based risk and integrity management programs, and public awareness programs."

[50] Jaxon Vanderbeken, "PG&E Records Raise Concerns About Pipeline Safety," San Francisco Chronicle, August 21, 2013. http://www.sfgate.com/default/article/PG-E-records-raise-concerns-about-pipeline-safety-4748239.php

[51] i.e. with National Fuel Gas Company http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={988DB0BD-681B-4DC4-8292-522A73547DDE}, and with Corning Natural Gas Company http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId=%7B9E97B92E-078E-4C33-A25D-2A7762B8EF95%7D.

[52] *National Fuel Gas Distribution Corporation, Order Establishing Rates for Gas Service*. New York Public Service Commission, Case 07-G-0141. December 21, 2007. http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={CA679FA8-6699-4D42-99C9-08DB87E60540}, *Corning Natural Gas Corporation, Order Adopting Terms of Joint Proposal and Establishing Multi-Year Rate Plan*, New York Public Service Commission, Case 11-G-280. April 20, 2012. http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={1BB5163F-175F-4755-8AF7-6E5A514C2B22}

[53] Commission Policy on Accelerated Replacement of Pipeline Facilities with Elevated Risk. Docket UG-120715. December 21, 2012. http://www.wutc.wa.gov/rms2.nsf/177d98baa5918c7388256a550064a61e/ecdcc1a53aed28c988257ae5005aff5e!OpenDocument

Gas Safety Plan Illustrates Deficiencies

"The bottom line is that Californians are safer now than before the tragedy in San Bruno, and the CPUC is firmly on course to ensure that its safety programs and culture are a model for the nation."

- CPUC Safety Actions and Safety Culture Changes: Status Report to the Legislature, April 24, 2013

The Gas Safety Plan raises a number of issues that the CPUC might wish to prepare to be able to address.

Plan Does Not Offer Methods to Measure its Success

The CPUC Gas Safety Plan, released in October of 2012 and updated in April 2013, is organized into thirty "tasks," which are further broken down into "plan elements." However, there is no connection of actions to goals through measurement. For example, under the overarching goal of #4 (Instilling a safety culture), Task 29 states that: "The CPUC will use enforcement to deter unsafe behavior by operators." This is followed by a number of plan elements, including:

Propose a citation program to delegate authority to staff to fine operators for code violations.

Develop citation procedures to reduce the number of violations committed by operators.

Both of these plan elements are listed as "completed," which likely refers primarily to the adoption of Resolution ALJ-274, which authorizes staff to fine pipeline operators for gas safety violations.

The presence of procedures do not necessarily mean that the CPUC's implementation of those recommendations have improved safety. After nearly two years, the Safety and Enforcement Division have only just released guidance for how it intends to enforce violations[54]—a guidance that recognizes that further revisions to ALJ-274 will likely be necessary. The CPUC should carefully consider specific goals or outcomes to be achieved with these programs and publicly articulate those specific goals and outcomes.

Plan Organization Does Not Lead Itself to Implementation

The plan recognizes many of the recommendations made by the NTSB and Independent Review Panel, as well as much of the gas safety-related legislation passed in 2011 and 2012. It also reveals a consistency between the actions the CPUC hopes to accomplish and the budget positions it has been granted in the previous two budget cycles.

The plan is not, however, organized in such a way that demonstrates how it can be implemented. It is a conceptual document more than an action plan. The "tasks" it outlines are more like goals, as the actions required under each "task" are sometimes the same actions required by other "tasks."

For instance, all the actions in Task 5 ("GSRB will perform targeted and random field checks of facilities to ground-truth the paperwork") are contained in both Task 3 ("GSRB will comprehensively inspect the physical condition of the gas system") and Task 4 ("GSRB will audit operators' procedures to ensure they're safe").

Safety responsibility solely focused on Safety and Enforcement Division (SED) and Gas Safety and Reliability Branch (GSRB)

The CPUC's Executive Director stated to Senate Budget Subcommittee #2 that all of the CPUC's employees are responsible for safety. The Gas Safety Plan, however, involves solely employees from the SED—relying heavily on the GSRB. While it is sensible that these employees would be the ones most involved with carrying out the plan, there are elements of the plan that would likely be better suited for personnel in other divisions, such as electricity, transportation, water, and telecommunications staff.

For example, GSRB is responsible for documenting, analyzing, and resolving complaints from whistleblowers and the general public (Task 19). It is not clear from the document why it is assumed that there will be no whistleblowers or complaints about rail or electric safety, or why whistleblowers need less protection for safety issues in those areas.

The Whistleblower hotline number is answered in the Consumer Service and Information Division even though GSRB is deemed responsible.

Tasks 17 and 20 state that SED is to work directly with Department of Finance to identify funding for staff and training, while other tasks state that SED or GSRB is to propose legislation (Tasks 8, 10, 16, 18, 29, 30). It's unclear whether commission or management would be involved in these activities.

It is illustrative to note that the establishment of the Safety Council, the purpose of which is to end the CPUC's silos, is the responsibility of the SED silo. While it might be appropriate for SED/GSRB to lead many items in the plan, the lack of other division involvement in the revised plan—released 6 months after the original version—could be interpreted to mean that employees outside of SED have no role in gas safety. The silos remain.

Unclear distinctions between risk assessment tasks

The Gas Safety Plan has three "tasks" that appear to have the same purpose, but have different plan elements:

- Task 10: The CPUC will develop and utilize risk-based safety programs
- Task 17: SED shall base safety program on Risk Assessment, not solely on compliance with rules
- Task 30: GSRB will develop and utilize risk-based safety programs

Task 10, 17, and 30 require similar actions—some of which are exactly the same—but it is not clear from their descriptions if these are the same or different requirements.

Gas Safety Timeline appears inconsistent with Rulemaking scoping memo

The plan appears to identify 19 actions to be addressed in the CPUC's current Gas Safety proceeding. All actions appear to propose completion by 2016. Of the 19 requirements, 4 have been completed (elimination of "grandfather clause," defining "traceable, verifiable, and complete" records, SB 705 safety plans, and authorizing staff to issue fines).

Commissioner Florio's May 2nd scoping memo only considers utility reporting metrics, and will be completed by the end of 2013.

The plan implies that in the two remaining years of the proceeding, the presiding commissioner will expand the scope of the rulemaking to include updating requirements for drug and alcohol testing, emergency response, SCADA upgrades, automatic shutoff and remote-controlled valves, in-line inspection retrofits, among other things. There has been some talk that the docket will be closing, which would indicate that many of these plans—including some that are statutory—will not be implemented.

The CPUC should consider addressing how it plans to integrate the safety plan within the current proceeding.

Non-compliance with statutory emergency response requirements of SB 44 (Corbett, Statutes of 2011) and lack of recognition of other gas safety statutes

SB 44 required the CPUC to develop standards for emergency response plans that utilities will be required to develop. The bill required the CPUC to provide a status report to the Legislature by January 1, 2013. The status report was published in May 2013.[55] The status report was, in large part, a summary of a two-day workshop held in September of 2011. It is unclear why the status report took an extra four months after the statutory deadline.

In proposing a strategic safety plan for industries other than gas, the CPUC should address implementation of AB 1650 (Statutes of 2012), a similar bill to SB 44, but for electric and water utilities. The CPUC will not be able to address the San Gabriel Valley windstorm until it implements AB 1650.

Other recent statutes related to natural gas safety do not appear to be addressed in the plan. AB 578 (Statutes of 2012) requires the CPUC to address all NTSB recommendations as well as PHMSA advisory bulletins. While the plan does mention PHMSA advisory bulletins, it does not suggest how they are to be incorporated.

AB 861 (Statutes of 2012) requires the CPUC to determine the appropriate ratemaking treatment for earnings- or stock price-based incentive compensation. This requirement appears to be within the purview of the current rulemaking, as its opening document calls on the proceeding to "consider how

we can align ratemaking policies, practices, and incentives to better reflect safety concerns and ensure ongoing commitments to public safety."

Failure to seek or lack of urgency in seeking feedback from NTSB and others.

The plan appears to indicate that it has completed all audits it intends to perform to fulfill NTSB recommendation P-11-22. The CPUC did not, however, respond to the NTSB until June 2013 to indicate that it has completed the recommendation.

This is especially concerning as the CPUC did not initially respond to the NTSB until about eight months after the recommendation letter had been sent. In contrast, the corresponding federal regulator is required by law to respond in 90 days. PG&E had corresponded with the NTSB four times before closing out a number of recommendations at the end of this past January.

The CPUC needs to be in close correspondence with NTSB to solicit feedback on the actions it is taking to address the problems that NTSB has identified. Otherwise the CPUC risks missing opportunities to improve its processes. For example, the NTSB might have made the CPUC aware of its deficiencies in following up on its audits of PG&E, as noted in a previous section.

Another opportunity for external review, recommended by the IRP, was to have an independent management audit of the utility safety branch to determine training requirements and technical qualifications for personnel to provide risk-based regulatory oversight, focused on outcomes. This audit appears not to have been performed. The CPUC had contracted with a company but had to drop the contract in late 2012 when the company was bought by a larger company, and the small business advantages that predicated the contract no longer applied. The CPUC therefore canceled that contract.

While the October and the April versions of the plan there has shown little schedule adjustment, the estimated completion date for the audit has moved back from the end of 2013 to the end of 2014. Given the CPUC's aggressive plans for action, the audit seems to be coming too late to adequately affect decision-making.

Despite the unforeseen contracting trouble last fall, it is nonetheless distressing that the CPUC has not been able to contract for an audit in the more than two years since the IRP recommendation, and that it doesn't expect to review the results and implement recommendations from the audit until four years after the IRP recommendation. The slowness of this process is in contrast with the half-year between the conception of the safety culture study and the submission of its consultant's first report.

The CPUC should prioritize its safety activities, particularly with regard to follow up action items resulting from NTSB and IRP recommendations related to San Bruno and gas pipeline safety.

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[54] http://www.cpuc.ca.gov/PUC/safety/Pipeline/Standard_Operating_Procedure_for_Citations.htm

[55] http://www.cpuc.ca.gov/NR/rdonlyres/807AC51E-BC02-4853-9E06-823D9A7D3DB7/0/EmergencyResponsePlanSB44Sec956ReportFinalDraft562013.pdf

Recommendations

1. The CPUC should consider and decide:

    - What is the broad safety management goal of the CPUC?
    - How can the CPUC measure success toward achieving its safety management goals?
    - What are the safety responsibilities of all CPUC staff, including those whose roles are not primarily involved with safety programs?
    - What should the role, if any, of safety staff be in rate case filings?
    - What is CPUC's enforcement philosophy? How should performance-based and compliance-based regulation be integrated?
    - How are safety goals and implementation and staff responsibilities addressed in all areas of CPUC oversight: gas, electricity, water, transportation, and telecommunications.

2. In the process of its zero-base budgeting exercise, the CPUC should identify its discretionary resources and put them to use in high-priority areas, such as safety.

3. The CPUC should re-imagine its safety plans as a strategic plan which includes goals, actions to meet those goals, and metrics to gauge success. The plans should address areas of responsibility and include other areas overseen by the CPUC, including electricity, water, transportation, and telecommunication. The plans should include the CPUC's enforcement philosophy. The CPUC should not expect the Legislature to recognize any safety plan not endorsed by the Commission through a vote.

4. The CPUC should task its PPD and the risk assessment units, working in conjunction with all of the divisions within the CPUC, to develop an implementation plan for establishing a safety management system within the CPUC and should consider the model used by the FAA, as expressed in FAA Order 8000.369A.[56]

5. CPUC decisions and resolutions should include safety-related findings. The record developed to support these findings should be facilitated by including safety considerations in proceeding scoping. Procedures by which to accomplish proceeding scoping should be developed in each industry division with the assistance of PPD and the risk assessment units. Procedures should be written and readily accessible to staff.

6. The CPUC should consider addressing how it plans to integrate the safety plan or a successor plan with the work of the current Gas Safety Rulemaking.

7. To better understand the utilities' responsibilities and to facilitate more effective follow-up on decisions, the CPUC should consider developing a system to organize and track ordering paragraphs of decisions and resolutions. The CPUC should identify other areas in which greater organization is necessary.

[56] http://www.faa.gov/documentLibrary/media/Order/8000.369A.pdf