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CPUC and Public Safety: A Focus on Energy Infrastructure

Introduction/Overview

This is the third in a series of oversight hearings of the California Public Utilities Commission (CPUC) as part of the committee's ongoing efforts. Today's hearing is about public safety related to our energy infrastructure, with a focus on gas pipeline safety.

It's been over four years since the catastrophic San Bruno gas pipeline explosion which decimated a neighborhood in the suburbs of San Francisco, killed and injured residents and destroyed several homes. In the aftermath of the explosion, several investigations, audits and reports have provided a series of recommendations related to how gas pipelines should be better managed by the utilities and how regulators, namely the CPUC, should improve its oversight of these operations to prevent future incidents.

Today's hearing is intended to ensure the CPUC is applying lessons learned from the horrific explosion. Specifically, the committee wants to understand whether the agency is on track in implementing the series of recommendations, whether and why some haven't been implemented and what else can, and should, be done to prevent future incidents. Moreover, the committee will want to explore how the lessons from the San Bruno explosion might be applied to the other safety-related activities of the CPUC.

San Bruno Explosion

On September 9, 2010, at approximately 6:11 P.M., as many families were returning home from work and school, a large explosion and resulting fireball leveled a suburban residential neighborhood in the City of San Bruno. The explosion created a jolt equivalent to a 1.3-seismic earthquake. Police and fire were on scene within minutes. Initial reports speculated a plane had crashed in the community or a gas station ruptured. These speculations persisted throughout the initial hours of the incident as the cause was not immediately known. As the paint on cars bubbled, and a fire engine windshield cracked from the heat, many residents voluntarily evacuated to get away from harm. More than 900 emergency personnel from the City of San Bruno and surrounding jurisdictions executed an emergency response. Firefighters requested water tenders to shuttle water, as local fire hydrants were dry due to damage to the water main. Emergency responders came to realize a natural gas pipeline under the asphalt pavement at the intersection of Glenview Drive and Earl Avenue in a residential area had erupted. Pacific Gas & Electric (PG&E), the operator of the natural gas pipeline took 95 minutes to stop the flow of gas



and to isolate the rupture site. The 28-foot long section of Line 132 that failed weighed about 3,000 pounds. It was propelled into the air and landed about 100 feet away. The rupture from the explosion created a 72-foot long by 26-foot wide crater. Immediately following the explosion, a fireball ensued that was fueled by flows of natural gas, a release of approximately 47.6 million standard cubic feet. Firefighting operations continued for 2 days once the flow of gas was finally interrupted. Hundreds of residents were sent to evacuation centers and were unable to return immediately to their homes. In total, the San Bruno explosion resulted in eight deaths, about 30 injuries, 38 homes destroyed, with several more damaged and hundreds of residents evacuated. The individuals who lost their lives were: Greg Bullis, Lavonne Bullis, William Bullis, James E. Franco, Janessa Greig, Jacqueline Greig, Jessica Morales, and Elizabeth Torres.

About Gas Pipeline Safety

Safety matters associated with pipeline facilities are subject to both state and federal laws and regulations. The United States Department of Transportation's (DOT) Pipeline and Hazardous Materials Safety Administration (PHMSA) develops, issues, and enforces pipeline safety regulations. However, the pipeline safety statutes provide for states to assume intrastate regulatory, inspection and enforcement responsibilities under an annual certification provided by PHMSA. The evaluation validates the CPUC's annual Progress Report documents, reviews the pipeline program procedures and records and the observation of on-site inspections of two pipeline operators. In California, the CPUC ensures the state's natural gas and liquid petroleum gas pipeline systems are designed, constructed, operated, and maintained according to safety standards set by the CPUC and the federal government. Furthermore, CPUC engineers are trained and qualified by the federal government. PHMSA also provides up to 80% reimbursement for personnel, equipment and activities related to gas pipeline safety. The amount of reimbursement depends on the results of the annual evaluation conducted by PHMSA of the state program. As noted in the federal incident investigation report of San Bruno, in the years leading up to the explosion, the CPUC was receiving scores in the mid- to high-90s, characterized as a superior, or an outstanding, score.

The Natural Gas Pipeline Safety Act of 1968 created the Office of Pipeline Safety within the DOT to implement and oversee pipeline safety regulations. The regulations adopted were based on existing industry consensus standards which used class locations to differentiate risk along gas pipelines and provide an additional safety margin for more densely populated areas. The class locations are still used today and are defined in the Federal Code of Regulations §192.5 with Class 1 being the least populated and Class 4 the most densely populated. The code identifies "high consequence areas" as those within Class 3 and Class 4, with some in Class 2. In California, PG&E operates 1,021 miles of gas transmission pipelines located in high consequence areas and Sempra operates 1,320 miles of natural gas transmission pipelines in high consequence areas.

The code also specifies the maximum allowable operating pressure (MAOP) for the pipeline segment within each class. Pipelines constructed after the adoption of federal safety rules in 1970 and California's safety rules in 1961 are required to be hydrostatic pressure tested to establish the MAOP. Hydrostatic pressure testing involves suspending the operation of the pipeline segment and filling it with water at a rate higher than the allowable pressure to inspect integrity of the pipeline. However, pipelines constructed prior to 1961 in California are exempted

(grandfathered) from post-construction pressure testing requirements. In California, as in the rest of the country, more than half of the pipelines were constructed prior to 1961, including Line 132.

Following several pipeline accidents in the 1990s, in 2003, PHMSA adopted integrity management system regulations in an effort to better address the pipeline safety in areas of high population density and in areas sensitive to environmental damage. The effort is known as integrity management system and is akin to process safety management in industrial processes, such as refineries. The integrity management system is a virtuous cycle incorporating the steps of: utilize accurate data, identify segments and threats; inspect and assess, mitigate and remediate, quality assessment, and generate new data and analysis. Natural gas pipeline engineering design employs, at its core, the goal of zero significant incidents. That is, if a pipeline is constructed, operated, and maintained according to its design, then it should operate without safety risk to the public.

The CPUC has adopted a number of general orders related to gas pipeline safety. The general orders address issues related to service, gas pressure and pressure testing, maintenance and operation, construction inspection, transmission, distribution piping systems, seismic safety, background checks and others.

Investigation Report – Cause of San Bruno Explosion

Federal rules require the National Transportation Safety Board (NTSB) to investigate pipeline incidents. The NTSB released their report within a year of the San Bruno explosion. The report pointed to a failure in pipeline Line 132, specifically a fissure in the welded seam which continued to grow and was undetected by PG&E. As the investigation noted, the utility's documentation did not match the characterization of the pipeline that had been installed as there was no mention of the welded seams and multiple segments. In the days leading up to the explosion, there were reports of natural gas smells which were inspected by PG&E crews. On the day of the incident, PG&E staff were conducting electrical work at the Milpitas Terminal, several miles away from San Bruno, and connected to all transmission pipelines in the peninsula, including Line 132. The electrical work resulted in an increase in the pressure of all transmission pipelines in the peninsula, including Line 132.

The NTSB report characterized the San Bruno explosion as an “organizational accident” in which PG&E had demonstrated a multitude of deficient operational procedures and management controls which led to “circumstances persisting and growing over time until the pipeline rupture occurred.” The NTSB noted that previous investigations, including the 2008 PG&E Rancho Cordova gas pipeline explosion that resulted in one death and the 1981 PG&E San Francisco gas pipeline leak, had revealed many of the same deficiencies of PG&E as in the San Bruno incident.

The NTSB's findings include:

- PG&E's pipeline integrity management program which should have ensured the safety of the system was deficient and ineffective on several fronts, including: the system was based on incomplete and inaccurate pipeline information; did not consider the design and materials contribution to the risk of a pipeline failure; failed to consider the presence of welded seam cracks as part of the risk assessment; used an examination method that did

not detect welded seam defects; and led to internal assessments of the program that were superficial and resulted in no improvements.

- Pipeline standards were either overlooked or ignored by PG&E when the pipe was installed in 1956, as it would not have met generally accepted industry quality control and welding standards in effect at the time.
- PG&E lacked a detailed and comprehensive procedure for responding to large-scale emergencies.
- PG&E's supervisory control and data acquisition system limitations caused delays in pinpointing the location of the break.
- The use of automatic shutoff valves or remote control valves would have reduced the amount of time taken to stop the flow of gas.
- PG&E did not follow federal rules regarding drug and alcohol testing of employees involved in an incident.

The NTSB report also cited the CPUC's failure to uncover the "pervasive and long-standing problems within PG&E." Additionally, the NTSB cited the inadequacy of CPUC and PHMSA audits that focus on verification of paper records and plans rather than on gathering information on how performance-based safety systems are implemented, executed and evaluated, and whether problem areas are being detected and corrected. The report specifically cited the failure of the CPUC to follow up on its own audit findings that PG&E was delayed in inspecting some of its pipelines, appeared to not provide adequate resources to carry out assessments in a timely manner, lacked a process to evaluate the use of automatic shutoff valves or remote control valves, as required by federal regulations. The NTSB also noted CPUC has raised concerns about the PG&E using the exception (grandfather) process to not excavate several immediate repair indications.

Below are some of the NTSB recommendations specific to the CPUC:

- CPUC, along with PHMSA, conduct a comprehensive audit of all aspects of PG&E operations, including control room operations, emergency planning, record-keeping, performance-based risk and integrity management programs and public awareness programs (ideally within 6 months).
- Require PG&E to correct all deficiencies identified as a result of the San Bruno accident investigation, as well as any additional deficiencies identified through the comprehensive audit recommended and verify that all corrective actions are completed.
- Develop an implementation schedule for the requirements of PG&E and ensure, through adequate oversight, that PG&E has aggressively and diligently searched documents and records relating to pipeline system components, such as pipe segments, valves, fittings, and weld seams in high consequence areas that have not had MAOP established through hydrostatic testing. Records should be traceable, verifiable, and complete.
- If the above records aren't available, provide oversight to any tests that PG&E performs.

Post-San Bruno Actions

Within weeks of the incident, the CPUC adopted resolution No. L-403 which included the establishment of an Independent Review Panel (IRP) who would be charged with gathering and reviewing facts to make recommendations about how to improve pipeline safety. In addition to the IRP, the CPUC would undertake a comprehensive review of its natural gas pipeline

programs. The IRP released their report within months of the explosion. The IRP noted numerous concerns about PG&E's operations, many of which were substantiated in the NTSB report. The IRP also provided a series of recommendations regarding how the CPUC can better address safety. Among the recommendations in the IRP are:

- Adopt performance standards for pipeline safety and reliability of PG&E.
- Division of gas auditing groups to create integrity management specialists.
- Improve interaction between gas safety organization and the Division of Ratepayer Advocates (presently call Office of Ratepayer Advocates).
- Retain independent industry experts in the near term to provide needed technical expertise, in order to provide a high level of technical oversight.
- Require the major regulated utilities operating in the California to submit the results of the independent integrity management audits as part of their rate case processes.
- Address the understaffing problem of the gas pipeline safety group.
- Augment current audits of utilities with audits assessing a segment of the operator's system through the entire life cycle of the current asset.
- Request the legislature replace the existing five year audit with a risk-based regime that would provide the CPUC gas pipeline safety staff more flexibility in allocating resources.
- Upgrade the CPUC's expertise in the analytical skills necessary for state-of-the art quality risk management work, and ensuring this staff has equal access to managers.
- Align CPUC's pipeline enforcement authority with that of the Office of State Fire Marshal's (OFSM).
- Consider transferring the gas safety staff to the OFSM.

Beyond the specific recommendations, the IRP report raised concerns about the culture at the CPUC and PG&E and to what extent the culture is not prioritizing safety. "The Panel believes both of these institutions must confront and change elements of their respective cultures to assure the citizens of California that public safety is the foremost priority." The IRP report also surfaced the question of whether the CPUC was "tough" enough or inquisitive enough to provide vibrant oversight.

"As a result of our investigation, the Panel concludes the explosion of the pipeline at San Bruno was a consequence of multiple weaknesses in PG&E's management and oversight of the safety of its gas transmission system. Furthermore, the Panel finds the CPUC did not have the resources to monitor PG&E's performance in pipeline integrity management adequately or the organizational focus that would have elevated concerns about PG&E's performance in a meaningful way." ---NTSB.

Legislative Response

In the year following the explosion, the legislature held hearings and proposed legislation sprouting from, and related to, the experience of the San Bruno explosion. Below is a list of legislation that was introduced and chaptered into law in 2011 (in Chapter order):

SB 56 (Hill, 2011), Chapter 519, institutes a number of safety-related measures, including requiring the CPUC to require comprehensive pressure-testing plans of the utilities.

SB 44 (Corbett, 2011), Chapter 520, requires the CPUC to set emergency response standards for PUC-regulated gas pipeline and distribution systems and requires that access to pipeline maps.

SB 216 (Yee, 2011), Chapter 521, requires the CPUC to require automatic shut-off or remote controlled valves on intrastate natural gas transmission lines located in high consequence areas or that traverse an active seismic earthquake fault line.

SB 705 (Leno, 2011), Chapter 522, requires natural gas utilities regulated by the CPUC to develop service and safety plans.

SB 879 (Padilla, 2011), Chapter 523, requires the CPUC to require natural gas utilities to account for ratepayer funds designated for pipeline maintenance and repair in a more transparent way.

Conclusion

As noted in the findings of the NTSB and IRP reports, the CPUC efforts were deficient in adequately overseeing the operations of PG&E. In light of litigation stemming from the San Bruno incident, PG&E has released 65,000 emails. Some of the emails reveal a level of coziness between some CPUC commissioners and staff and PG&E that have further eroded public confidence in the leadership of the agency. In response to the culmination of events, the agency has undergone significant changes, including the appointment of a new President, new Executive Director, new commissioner, reorganization of its Safety Division and others. Recently appointed CPUC President Picker has called himself a “Safety Commissioner,” further stating that the agency’s priority going forward would be focused on safety. In June 2014, Governor Brown has also appointed a new advisor on CPUC modernization and reform, Edward O’Neill, to work closely with, but independently from, the CPUC. In the past month, Crowe Horwath, an independent consultant contracted by the CPUC, released their independent review of the agency’s efforts to implement the myriad of safety recommendations related to gas pipeline safety since the 2010 explosion. Their consultants will share the findings of their review and related recommendations moving forward.

Although the main focus of today’s hearing is on the reforms related to gas pipeline safety, the committee will want to explore to what extent the lessons learned from the 2010 explosion may be applied to other CPUC efforts.

To further the committee’s exploration, the members will want to consider:

- To what extent has the CPUC implemented some of the recommended changes?
- Which recommendations have not been implemented and why?
- Are further reforms needed to ensure safety?
- How is the agency managing implementation of the various recommendations?
- Is the CPUC the appropriate agency to address natural gas pipeline safety?
- How is the CPUC fostering a culture of safety? How can it be measured?
- Is it reasonable to expect an agency focused on rate-setting of utility service to also adequately address safety? Or are there inherent conflicts between both efforts?
- Is the CPUC the appropriate agency to address natural gas pipeline safety?