Testimony of the Honorable Deborah A.P. Hersman
Chairman
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Pipeline Safety: Assessing the San Bruno, California Explosion
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Chairman Lautenberg, Ranking Member Wicker, Members of the Subcommittee, thank you for the opportunity to address you today concerning the National Transportation Safety Board's (NTSB) investigation and recently issued accident report on the pipeline rupture and fire in San Bruno, California, 13 months ago. This tragic accident was particularly devastating to the city of San Bruno and its 41,000 residents. It resulted in the deaths of eight people, 58 injuries, destroyed 38 homes, damaged 70 more homes, and caused the evacuation of many more residents from their homes.

Today, I will discuss the results of the NTSB's investigation and its findings, probable cause determination, and series of far reaching safety recommendations. Mr. Chairman, the troubling lessons learned from the San Bruno pipeline rupture compel that all necessary steps be taken to minimize the safety risks that underground pipelines present.

We also need to understand that the oil and gas pipeline network in the United States is pervasive—consisting of 2.5 million miles—with a significant amount of new pipeline design and construction activity underway. The unacceptable safety risks present at San Bruno certainly apply to aging pipelines but some of the NTSB's finding also extend to newer pipelines, particularly in light of lax Federal and state pipeline safety oversight and operators' ability to exploit regulatory and enforcement deficiencies.

THE ACCIDENT

On September 9, 2010, about 6:11 p.m. Pacific Daylight Time, a 30-inch-diameter segment of an intrastate natural gas transmission pipeline known as Line 132, owned and operated by the Pacific Gas and Electric Company (PG&E), ruptured in the Crestmoor neighborhood in San Bruno, California. The rupture occurred at mile point 39.28 of Line 132, at the intersection of Earl Avenue and Glenview Drive. The rupture produced a crater about 72 feet long by 26 feet wide. The section of pipe that ruptured, which was about 28 feet long and weighed about 3,000 pounds, was found 100 feet away from the crater. PG&E estimated that the rupture released 47.6 million standard cubic feet of natural gas—enough to serve 1200 residential homes for one year—which ignited and resulted in the intense and deadly fire.

More than 900 emergency responders from the city of San Bruno and surrounding jurisdictions executed a coordinated emergency response. Once the flow of natural gas was interrupted, this response included defensive operations, search and evacuation, medical operations, and firefighting operations that continued for 2 days. Overall, the emergency response was well coordinated and effectively managed by local responders.

However, PG&E took over 90 minutes to stop the flow of gas and to isolate the rupture site—a response time that was excessively long and contributed to the extent and severity of property damage and increased the life-threatening risks to the residents and emergency responders. The NTSB found that PG&E lacked a detailed and comprehensive procedure for responding to large-scale emergencies such as a transmission pipeline break, including a defined command structure that clearly assigns a single point of leadership and allocates specific duties to supervisory control and data acquisition (SCADA) staff and other involved employees. PG&E's SCADA system limitations caused delays in pinpointing the location of the break. The use of either automatic shutoff valves or remote control valves would have reduced the amount of time taken to stop the flow of gas.

THE NTSB'S INVESTIGATION

The NTSB determined that the probable cause of the accident was PG&E's (1) inadequate quality assurance and quality control in 1956 during its Line 132 relocation project, which allowed the installation of the substandard and poorly welded pipe section with a visible seam weld flaw that, over time grew to a critical size, causing the pipeline to rupture during a pressure increase stemming from poorly planned electrical work at PG&E's Milpitas Terminal where Line 132 originates -- approximately 39 miles south of where the rupture occurred; and (2) an inadequate pipeline integrity management program, which failed to detect and repair or remove the defective pipe section.

Contributing to the accident were the actions taken decades ago by the pipeline safety regulator within the state of California, the California Public Utilities Commission (CPUC), and the U.S. Department of Transportation (DOT) to grandfather pre-1961 and pre-1970 pipelines, respectively, from the regulatory requirement for pressure testing, which likely would have detected the installation defects. Also contributing to the accident was the CPUC's failure to detect the inadequacies of PG&E's pipeline integrity management program. Additionally contributing to the severity of the accident were the lack of either automatic shutoff valves or remote control valves on the line and PG&E's flawed emergency response procedures that delayed the isolation of the rupture to stop the flow of gas.

The NTSB's investigation found that the rupture of Line 132 was caused by a fracture that originated in the partially welded longitudinal seam of one of six short pipe sections, which are known as "pups." The fabrication of five of the pups in 1956 during the relocation of Line 132 would not have met generally accepted industry quality control and welding standards today or at the time of installation, indicating that those standards were either overlooked or ignored. The weld defect in the failed pup would have been visible when it was installed. The investigation also determined that a sewer line installation in 2008 near the rupture did not damage the defective pipe.

Even prior to completion of the San Bruno investigation, in early January of this year, the NTSB issued six safety recommendations to PG&E and CPUC – five of which were designated as "Urgent." One "Urgent" safety recommendation was also issued to the Pipeline and Hazardous Materials Safety Administration (PHMSA). These safety recommendations pointed out the need for PG&E to address inaccuracies in its records for the accident pipe, including the need to search aggressively and diligently for records concerning the pipeline system components for PG&E natural gas transmission pipelines in high consequence areas that had not had a maximum allowable operating pressure established through hydrostatic pressure testing. Also, after the NTSB's investigative hearing on the accident, it issued two additional recommendations to PHMSA regarding issuing guidance to pipeline operators on the importance of sharing system-specific information with emergency response agencies and one recommendation to PG&E to require its SCADA operators to notify immediately the appropriate 9-1-1 emergency call center when there is a possible pipeline rupture.

Unfortunately, the NTSB had seen these problems at PG&E before. Several deficiencies revealed by the NTSB investigation, such as PG&E's poor quality control during the pipe installation and inadequate emergency response, were also factors in the 2008 explosion of a PG&E gas pipeline in Rancho Cordova, California and a 1981 PG&E gas pipeline leak in San Francisco that were also investigated by the NTSB. In Rancho Cordova, PG&E installed the wrong pipe, and its emergency response was inadequate with PG&E dispatching untrained personnel. In the San Francisco accident, PG&E's inaccurate record-keeping, dispatch of personnel who were not trained or equipped to close valves, and unacceptable delays in shutting down the pipeline led to the flow of natural gas from a ruptured pipeline lasting for over 10 hours.

More importantly, the NTSB's accident report, adopted on August 30, depicts PG&E's longstanding multiple deficiencies in its operational procedures and management controls and failure to recognize and correct them as key factors leading to the persistence and growth of hazardous circumstances over time until an accident occurs—in this case, a rupture of a 30-inch pipeline. These higher-order, or organizational accident factors, which the NTSB views as a systemic problem, must be addressed to improve PG&E's safety management practices. In general, organizational accidents have multiple contributing causes, involve people at numerous levels within a company, and are characterized by a pervasive lack of proactive measures to ensure adoption and compliance with a safety culture. Moreover, organizational accidents are catastrophic events with substantial loss of life, property, and environment; they also require complex organizational changes in order to avoid them in the future.

PERFORMANCE-BASED PIPELINE SAFETY PROGRAMS

In 2003, PHMSA promulgated gas pipeline safety regulations that implemented various statutory requirements enacted the previous year. PHMSA, with the support and assistance of the pipeline industry, added to its prescriptive regulatory scheme a performance-based regulatory scheme with broad performance goals as the basis for its pipeline safety program, most notably with respect to integrity management programs, and to a lesser extent, to public awareness programs. This new regulatory scheme applies to gas transmission and distribution systems and

to hazardous liquid pipeline systems. Under performance-based regulations, the fundamental premise is that an individual pipeline operator knows its system best, and thereby is best able to develop, implement, execute, evaluate, and adjust safety priorities and measures. Within this regulatory framework, pipeline operators have a great deal of flexibility and responsibility to develop their individual programs and plans, determine the specific performance standards, implement their plans and programs, and conduct periodic self-evaluations that best fit their particular pipeline systems.

Integrity management programs for hazardous liquid and gas transmission pipelines typically require operators to assess the condition of their pipelines. Use of "in-line" inspection tools that travel through the pipeline and pressure testing are two effective methods to detect and identify internal defects, including the type of weld defects that caused Line 132 to rupture. Prior to the accident, no in-line inspections had been performed on Line 132. PG&E's pipeline integrity management program, which should have ensured the safety of the system, was deficient and ineffective because it

- 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 previously identified welded seam cracks in Line 132 as part of its risk assessment;
- resulted in the selection of an examination method that could not detect welded seam defects; and
- used internal assessments of the program that were superficial and resulted in no improvements.

The effectiveness of performance-based pipeline safety programs is dependent on the diligence and accountability of both the operator and the regulator—the operator for development and execution of its plan, and the regulator for oversight of the operators. However, as is evident in this investigation, the PG&E integrity management and public awareness programs failed to achieve their stated goals because performance measures were neither well defined nor evaluated with respect to meeting performance goals. By overlooking the existence of, and the risk from, manufacturing and fabrication defects under its integrity management program, PG&E took no actions to assess risk and ultimately was unaware of the internal defects that caused the rupture of Line 132.

The NTSB's investigation also determined that CPUC failed to detect the inadequacies in PG&E's integrity management program and that PHMSA's integrity management inspection protocols need improvement. Because PHMSA has not incorporated the use of effective and meaningful metrics as part of its guidance for performance-based management pipeline safety programs, its oversight of state public utility commissions regulating gas transmission and hazardous liquid pipelines could be improved. Without effective and meaningful metrics in performance-based pipeline safety management programs, neither PG&E nor CPUC was able to properly evaluate or assess PG&E's pipeline system.

NTSB'S RECOMMENDATIONS

In addition to the already discussed recommendations issued before the final report was completed, the NTSB made 29 new safety recommendations in its report, for an unusually high total of 39 recommendations stemming from this accident. Recommendation recipients include the Secretary of Transportation, PHMSA, PG&E, CPUC, the Governor of the State of California, the American Gas Association, and the Interstate Natural Gas Association of America.

Four of the recommendations call on the Secretary of Transportation to conduct audits of the effectiveness of PHMSA's oversight of performance-based pipeline safety programs, its enforcement policies and procedures, and its state pipeline safety certification and grant programs. We addressed thirteen of our new recommendations to PHMSA. These included:

- requiring operators of natural gas transmission and distribution pipelines and hazardous liquid pipelines to provide more system-specific information to emergency responders and communities where the pipelines are located and to ensure their SCADA centers are equipped with tools to immediately pinpoint the location of leaks and control room operators immediately notify 9-1-1 emergency call centers when a possible pipeline rupture is indicated.
- amending the Pipeline Safety Regulations to require that automatic shutoff valves or remote control valves be installed in areas with the highest potential for risk; remove the provision that exempts gas transmission pipelines constructed before 1970 from hydrostatic testing to determine the line's maximum allowable operating pressure; and require post-construction hydrostatic pressure tests of at least 1.25 the maximum allowable operating pressure in order for manufacturing- and construction-related defects to be considered stable.
- requiring that all natural gas transmission pipelines be configured so as to accommodate in-line inspection tools, with priority given to older pipelines.
- developing and implementing standards for integrity management and other performance-based safety programs that require operators of all types of pipeline systems to regularly assess the effectiveness of their programs.
- working with state public utility commissioners to implement pipeline oversight programs that employ meaningful metrics available in a centralized database and to identify and correct deficiencies in these oversight programs.

The NTSB directed eight recommendations to PG&E that included:

- establishing comprehensive emergency response procedures.
- identifying the likelihood and consequence of failures associated with planned work activities and developing contingency plans.
- expediting installation of automatic shutoff valves and remote control valves in high consequence areas.
- assessing every aspect of its integrity management program and implementing a revised program that, at a minimum, addresses issues including consideration of all defect and leak data for the life of each pipeline, including its construction, a revised risk analysis methodology, and an improved self-assessment process.

The NTSB addressed two recommendations to the CPUC:

- conduct a comprehensive audit of all PG&E's operations, with assistance from PHMSA.
- require PG&E to correct all deficiencies identified as a result of the NTSB's San Bruno accident investigation, as well as additional deficiencies identified as a result of the recommended CPUC comprehensive audit, and verify that all corrective actions are completed.

The NTSB also recommended that the Governor of the State of California evaluate the authority and ability of CPUC's pipeline safety division to enforce effectively state pipeline safety regulations and that the American Gas Association and the Interstate Natural Gas Association of America report to the NTSB on their progress in developing and introducing advanced in-line inspection platforms for use in gas transmission pipelines not currently accessible to existing in-line inspection platforms.

CLOSING

The accident in San Bruno was a horrific and tragic event. Particularly regrettable is the history of Federal and state ineffectiveness in overseeing pipeline safety, identifying systemic safety problems, and the lack of meaningful enforcement. Equally troubling is the failure of the regulators to identify PG&E's safety and emergency response deficiencies and carefully audit and inspect pipeline operations even after past deficiencies had been identified and documented. I believe if the NTSB recommendations are implemented, the safety of pipelines and surrounding communities across the country will be vastly improved so that we are not investigating a similar accident in the future.

This concludes my testimony, and I would be happy to answer any questions you may have.