



National Transportation Safety Board

Washington, DC 20594

Office of the Chairman

November 18, 2013

The Honorable Jerry Hill
California State Senate
State Capitol
Sacramento, California 95814

Dear Senator Hill,

Thank you for your focus on safety culture at your upcoming hearing. It is a challenging issue and one requiring constant vigilance. For many years, the National Transportation Safety Board (NTSB) has called for improved safety culture and the implementation of related safety management techniques in all modes of transportation.

The NTSB has a long history of examining organizational issues in our accident investigations. In response to issues that we have identified, our agency held a symposium on corporate culture in 1997 and recently revisited the topic in our September 2013 public forum on safety culture in transportation. In the years between these two events, notable advancements occurred in the recognition and promotion of an effective organizational safety culture to maintain safe operations in numerous high-risk industries. The importance of such a culture is now recognized across all modes of transportation. Many of the US Department of Transportation's operating agencies and modal industry groups now publish resources related to the role of a safety culture in preventing accidents and injuries.

According to Dr. James Reason, an expert on the topic, an organization operating with a strong safety culture is equated with an informed culture.¹ Various safety analysis and reporting systems and initiatives have been developed to support this belief. In aviation, for example, these include hazard detection and analysis programs, such as Flight Operational Quality Assurance (FOQA),² that use data from aircraft flight recorders to monitor trends in operations and identify possible safety concerns, and non-punitive self-reporting programs, such as Aviation Safety Action Programs (ASAP),³ that allow individuals to report safety concerns without fear of disciplinary or enforcement action.

The NTSB has also supported efforts to merge reporting programs and other elements of safety policy, risk analysis, monitoring, and promotional activities to create a safety management

¹ J. Reason, *Managing the Risks of Organizational Accidents*. Aldershot: Ashgate, 1997.

² See Federal Aviation Administration Advisory Circular 120-82, Flight Operational Quality Assurance at http://www.faa.gov/regulations_policies/advisory_circulars/index.cfm/go/document.information/documentID/23227.

³ See Federal Aviation Administration Advisory Circular 120-66B, Aviation Safety Action Program (ASAP) at http://www.faa.gov/regulations_policies/advisory_circulars/index.cfm/go/document.information/documentID/23207.

system, or SMS. An SMS is a structured, documented system developed to enhance the safe operation of fleets, equipment, and other complex systems to prevent human injury or loss of life and to avoid damage to the environment. With an SMS, employees and operators identify and resolve safety problems *before* casualties or incidents occur (that is, they regulate themselves, rather than simply comply with regulations imposed from outside, which usually means waiting for notification of defects before taking corrective action).

The maritime industry was an early adopter of SMS techniques. It developed international safety management standards in the early 1990s, in response to a number of serious marine casualties caused by human error or management failure. These accidents occurred despite improvements in engineering and technology designed to prevent them. One of the most serious was the March 1987 capsizing of the passenger/car ferry *Herald of Free Enterprise* off the Belgian coast, which killed 193 people. The investigating British justice described the ferry management's failures as "the disease of sloppiness."

In the aftermath of that disaster, the International Maritime Organization (IMO), a specialized agency of the United Nations, began developing guidelines for safe ship management. In May 1991, the IMO began work on what became the International Safety Management (ISM) code, which was developed to provide an international standard for the safe management and operation of ships in order to reduce injury and the loss of life from marine accidents and to prevent pollution accidents. In 1993, the IMO made the ISM code mandatory, and it was adopted by IMO members, including the United States, in May 1994. The code became effective July 1, 1998.

Other segments of the US transportation industry also demonstrate support for as SMS, which establishes processes for collecting and analyzing data on potential safety problems and for evaluating mitigations to address safety risks before an accident happens. A fundamental hallmark of such systems are nonpunitive reporting programs that allow personnel involved in transportation organizations to identify safety problems to operating companies without fear of reprisal; this reporting then enables managers to recognize and address safety hazards they might otherwise have overlooked. Congress has directed Department of Transportation (DOT) modal agencies to implement these systems. The Federal Aviation Administration (FAA) is working to implement SMS requirements for operators, and the most recent FAA authorization bill (Public Law 112-95) calls for the FAA to require airlines to establish SMS systems. This regulation is currently under review by the Office of the Secretary of Transportation. Once that review is completed, the rule will be submitted to the Office of Management and Budget for review prior to issuance. Safety culture and safety management frameworks like as SMS are interdependent. A positive safety culture helps to ensure that an SMS works in practice, and an effective SMS enables a positive safety culture.⁴

Despite the widespread acceptance of the need to develop an effective safety culture and to implement safety management frameworks in transportation, our accident investigations continue to reveal deficiencies. Recent examples include the October 15, 2003,

⁴ EUROCONTROL/FAA, (2008) *Safety Culture in Air Traffic Management: A White Paper*, available at <http://www.eurocontrol.int/sites/default/files/content/documents/nm/safety/safety-atm-whitepaper-final-low.pdf>.

allision of the Staten Island ferry, *Andrew J. Barberi*;⁵ the June 19, 2009, derailment of a Canadian National (CN) train in Cherry Valley, Illinois, resulting in a subsequent hazardous materials release and fire;⁶ the fatal collision of two Washington Metropolitan Area Transit Authority (WMATA) Metrorail Trains on June 22, 2009;⁷ the hazardous liquid pipeline release in Marshall, Michigan, on July 25, 2010,⁸ and the fatal natural gas pipeline rupture in San Bruno, California, on September 9, 2010.⁹ These investigations have led us to issue a number of recommendations that companies can undertake to enhance operational safety, including the following:

From the *Andrew J. Barberi* allision investigation:

M-05-06 (Issued to the US Coast Guard)

Seek legislative authority to require all U.S.-flag ferry operators to implement safety management systems, and once obtained, require all U.S.-flag ferry operators to do so.

M-05-07 (Issued to the states operating public ferries)

Encourage your public ferry operators to voluntarily request application of the Federal requirements at 33 CFR 96 for implementing a safety management system, if they have not already done so.

In addition, we reiterated Safety Recommendation M-05-06 in our investigation report on the July 2, 2008, collision of the passenger ferry M/V *Block Island* and the US Coast Guard cutter *Morro Bay*.¹⁰

⁵ *Allision of Staten Island Ferry Andrew J. Barberi, St. George, Staten Island, New York, October 15, 2003* Marine Accident Report, NTSB/MAR 05/01 (Washington, DC: National Transportation Safety Board, 2005).

⁶ *Derailment of CN Freight Train U70691-18 With Subsequent Hazardous Materials Release and Fire Cherry Valley, Illinois, June 19, 2009*, Railroad Accident Report NTSB/RAR-12/01 (Washington, DC National Transportation Safety Board, 2012).

⁷ *Collision of Two Washington Metropolitan Area Transit Authority Metrorail Trains Near Fort Totten Station, Washington, D.C. June 22, 2009*, Railroad Accident Report NTSB/RAR-10/02 (Washington, DC: National Transportation Safety Board, 2010).

⁸ *Enbridge Incorporated Hazardous Liquid Pipeline Rupture and Release Marshall, Michigan July 25, 2010* Pipeline Accident Report NTSB/PAR-12/01 (Washington, DC: National Transportation Safety Board, 2012).

⁹ *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: National Transportation Safety Board, 2011).

¹⁰ *Collision Between U.S. Passenger Ferry M/V Block Island and U.S. Coast Guard Cutter Morro Bay, Block Island Sound, Rhode Island*, Marine Accident Report NTSB/MAR-11/01 (Washington, DC: National Transportation Safety Board, 2011).

From the Cherry Valley, Illinois, railroad accident investigation:

R-12-3 (Issued to the Federal Railroad Administration)

Require that safety management systems and the associated key principles (including top-down ownership and policies, analysis of operational incidents and accidents, hazard identification and risk management, prevention and mitigation programs, and continuous evaluation and improvement programs) be incorporated into railroads' risk reduction programs required by Public Law 110-432, Rail Safety Improvement Act of 2008, enacted October 16, 2008.

R-12-12 (Issued to the CN Railroad)

Implement a process, consistent with the principles of a safety management system, to ensure accuracy and visibility of emergency contact information at all highway/rail grade crossings on your system.

R-12-13 (Issued to the CN Railroad)

Implement a program consistent with principles of safety management systems to periodically test all aspects of your internal emergency communication system to ensure that personnel are familiar with the system's operation and that emergency notifications can be communicated immediately to any chief dispatcher or rail traffic controller in your system.

From the WMATA accident investigation:

R-10-16 (Issued to WMATA)

Require that your safety department; representatives of the operations, maintenance, and engineering departments; and representatives of labor organizations regularly review recorded operational data from Metrorail train onboard recorders and the Advanced Information Management system to identify safety issues and trends and share the results across all divisions of your organization.

R-10-17 (Issued to WMATA)

Develop and implement a non-punitive safety reporting program to collect reports from employees in all divisions within your organization, and ensure that the safety department; representatives of the operations, maintenance, and engineering departments; and representatives of labor organizations regularly review these reports and share the results of those reviews across all divisions of your organization.

From the Marshall, Michigan, accident investigation:

P-12-11 (Issued to Enbridge Inc.)

Revise your integrity management program to ensure the integrity of your hazardous liquid pipelines as follows: (1) implement, as part of the excavation selection process, a safety margin that conservatively takes into account the uncertainties associated with the sizing of crack defects from in-line inspections; (2) implement procedures that apply a continuous reassessment approach to immediately incorporate any new relevant information as it becomes available and reevaluate the integrity of all pipelines within the program; (3) develop and implement a methodology that includes local corrosion wall loss in addition to the crack depth when performing engineering assessments of crack defects coincident with areas of corrosion; and (4) develop and implement a corrosion fatigue model for pipelines under cyclic loading that estimates growth rates for cracks that coincide with areas of corrosion when determining reinspection intervals.

P-12-017 (Issued to the American Petroleum Institute)

Facilitate the development of a safety management system standard specific to the pipeline industry that is similar in scope to your Recommended Practice 750, Management of Process Hazards. The development should follow established American National Standards Institute requirements for standard development.

From the San Bruno, California, accident investigation:


P-11-24 (Issued to the Pacific Gas & Electric Company)

Revise your work clearance procedures to include requirements for identifying the likelihood and consequences of failure associated with the planned work and for developing contingency plans.

I am also enclosing a copy of our open recommendations to the California Public Utilities Commission. Again, I appreciate your efforts to bring attention to the important topic of safety culture. We know that, if more widely implemented, the measures discussed above will improve transportation safety.

If you have additional questions, please contact Mr. Steve Blackistone at (202) 314-6005 or blackis@ntsb.gov.

Sincerely,

 **Deborah A.P. Hersman**
Chairman
Approved for Electronic Transmission
No Hard Copy Will Follow

Enclosure

Rec #: R-13-037
NTSB Status: Open - Await Response
Issue date: 10/4/2013
Accident Date: 9/5/2013
Source Event: Accident
Location: Los Angeles California

Mode: Rail
Most Wanted List: No
Closed date:
Report Number:
Accident ID: DCA13FR011

Rec: R-13-037 Rec Status: Open - Await Response
TO THE CALIFORNIA PUBLIC UTILITIES COMMISSION: Before authorizing it to resume passenger service, independently verify that the Angels Flight Railway meets all applicable accepted industry standards and engineering practices including: (1) preventing excessive wheel and track wear; (2) providing emergency stopping under all foreseeable failure modes; (3) ensuring safety systems are not bypassed; (4) preventing passenger ejection in the event of a collision; and, (5) providing a suitable means of emergency egress for passengers and ingress for emergency responders. (Urgent)

Addressee: State of California, Public Utilities Commission
Status: Open - Await Response

Background Synopsis:

Angels Flight is a funicular railway located in downtown Los Angeles, California. Two cars operate on a 33% inclined guide way by means of a mutually connected wire rope for a travel distance of about 300 feet. Power is supplied from a station house at the top of the guide way. An operator collects revenue, and observes and controls movement from a booth at the top of the system. Movement can be commanded by the operator in either automatic or manual mode. Design speed is 3.5 miles per hour. At about 11:30 a.m. September 5, 2013, the downward-moving car derailed near the mid-point of the guide way. There was one passenger aboard that car and five passengers aboard the upward-moving car. The operator recognized that the car stopped but was unaware that it had derailed. He initiated manual operation to attempt to berth the cars at their respective gates. Both cars moved about 100 feet, but stopped short of their gates. The operator then reversed the direction of the cars in an attempt to berth the cars. The derailed car moved uphill toward mid-point and again stopped. The operator then recognized a derailment had occurred and notified senior Angels Flight management of the derailment. Angels Flight did not notify the National Response Center, nor did they call 911 for assistance with evacuating the passengers. A citizen notified the fire department of the accident. The NTSB investigated a prior collision on the Angels Flight Railway that occurred February 1, 2001, which resulted in a passenger fatality.¹ The NTSB determined that the probable cause of that accident was the improper design and construction of the Angels Flight funicular drive and the failure of various organizations involved in that design and construction to ensure that the railway system conformed to initial safety design specifications and known funicular safety standards.

Recommendation:

TO THE CALIFORNIA PUBLIC UTILITIES COMMISSION: Before authorizing it to resume passenger service, independently verify that the Angels Flight Railway meets all applicable accepted industry standards and engineering practices including: (1) preventing excessive wheel and track wear; (2) providing emergency stopping under all foreseeable failure modes; (3) ensuring safety systems are not bypassed; (4) preventing passenger ejection in the event of a collision; and, (5) providing a suitable means of emergency egress for passengers and ingress for emergency responders. (Urgent)

Rec #: P-11-022
NTSB Status: Open - Acceptable Response
Issue date: 9/26/2011
Accident Date: 9/9/2010
Source Event:
Location: San Bruno California

Mode: Pipeline
Most Wanted List: No
Closed date:
Report Number:
Accident ID: DCA10MP008

Rec: P-11-022 Rec Status: Open - Acceptable Response
TO THE CALIFORNIA PUBLIC UTILITIES COMMISSION: 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.

Addressee: State of California, Public Utilities Commission
Status: Open - Acceptable Response

Background Synopsis:

On September 9, 2010, about 6:11 p.m. Pacific daylight time,¹ a 30-inch-diameter underground natural gas transmission pipe is identified by the company as Line 132), owned and operated by Pacific Gas and Electric Company (PG&E), ruptured in a r

area in San Bruno, California. The accident killed eight people, injured many more, and caused substantial property damage. The rupture on Line 132 occurred near mile point 39.28, at the intersection of Earl Avenue and Glenview Drive in San Bruno. About 47.6 million standard cubic feet of natural gas were released as a result of the rupture. The released natural gas was ignited after the rupture; the subsequent explosion created a crater about 72 feet long by 26 feet wide, and the resulting fire destroyed 38 homes and damaged 70. A ruptured pipe segment about 28 feet long was found about 100 feet away from the crater. The safety recommendations in this letter address the importance of pipeline operators' communications with the local 911 emergency call center(s), both before and in the event of a pipeline rupture. Effective emergency preparedness plans need to include appropriately detailed and accurate maps of the pipelines located within the area of the accident. These local maps are a crucial component of the emergency response planning process and of the emergency response itself. In addition to the exact path of each pipeline, which is shown on the maps, other system-specific technical information for each pipeline, such as pipe diameter, operating pressure, product transported (by shipping name and 4-digit U.S. Department of Transportation Hazard Identification Code UN number²), depth (soil coverage), potential damage impact distance (potential impact radius, defined in Title 49 Code of Federal Regulations 192.903), and specific emergency contact information (that is, telephone numbers), also is needed by emergency responders to plan and execute a timely and effective response to a pipeline emergency. At the National Transportation Safety Board's (NTSB) public hearing³ on the accident, which was held March 1-3, 2011, in Washington, DC, testimony of the chief of the San Bruno Fire Department (SBFD) indicated that before the accident, the SBFD was aware of the PG&E gas distribution system, but it was neither aware of nor had information about the natural gas transmission line that ruptured in the accident. The SBFD had not accessed the National Pipeline Mapping System that displays the location of the nation's natural gas transmission and hazardous liquid pipelines. The chief also indicated that since the accident, the SBFD has made contact with PG&E and obtained maps showing the locations of PG&E natural gas transmission pipelines. The PG&E program manager for safety, health, and claims testified that after the accident PG&E made maps of its natural gas transmission pipelines available to all of the communities and jurisdictions in which PG&E pipelines are located. When compared to distribution pipelines, transmission pipelines have different operating characteristics, such as pipeline diameter and operating pressures. Because of the differences in operating characteristics, transmission pipelines have different safety risks and concerns for the emergency response, including the pipeline company's ability to shut down the pipeline rapidly. NTSB investigations in all transportation modes have shown that the most successful emergency responses occur when the responders are prepared through training, drills, and exercises and have readily available information to assess the event. Prior to the accident, PG&E's public awareness program for emergency responders did not include identification of pipeline locations. At the NTSB's public hearing, the SBFD fire chief testified, "The benefit of having knowledge of the location of the pipelines [is] because it gives the fire service the ability to pre-plan, to do scenario-based training." The U.S. Department of Transportation has established regulations and programs aimed at providing information to responders (for example, pipeline markers, pipeline maps, railcar and truck placards). First responders can provide timely and valuable information to pipeline operators for the emergency response only when the responders know that a pipeline is involved and the name of the pipeline operator.

Recommendation:

TO THE CALIFORNIA PUBLIC UTILITIES COMMISSION: 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.

Rec #: P-11-023

NTSB Status: Open - Acceptable Response

Issue date: 9/26/2011

Accident Date: 9/9/2010

Source Event:

Location: San Bruno California

Mode: Pipeline

Most Wanted List: No

Closed date:

Report Number:

Accident ID: DCA10MP008

Rec: P-11-023

Rec Status: Open - Acceptable Response

TO THE CALIFORNIA PUBLIC UTILITIES COMMISSION: Require the Pacific Gas and Electric Company to correct all deficiencies identified as a result of the San Bruno, California, accident investigation, as well as any additional deficiencies identified through the comprehensive audit recommended in Safety Recommendation P-11-22, and verify that all corrective actions are completed.

Addressee: State of California, Public Utilities Commission

Status: Open - Acceptable Response

Background Synopsis:

On September 9, 2010, about 6:11 p.m. Pacific daylight time,¹ a 30-inch-diameter underground natural gas transmission pi is identified by the company as Line 132), owned and operated by Pacific Gas and Electric Company (PG&E), ruptured in a n area in San Bruno, California. The accident killed eight people, injured many more, and caused substantial property damage on Line 132 occurred near mile point 39.28, at the intersection of Earl Avenue and Glenview Drive in San Bruno. About 47.6 standard cubic feet of natural gas were released as a result of the rupture. The released natural gas was ignited after the ru subsequent explosion created a crater about 72 feet long by 26 feet wide, and the resulting fire destroyed 38 homes and da ruptured pipe segment about 28 feet long was found about 100 feet away from the crater. The safety recommendations in t address the importance of pipeline operators' communications with the local 911 emergency call center(s), both before and of a pipeline rupture. Effective emergency preparedness plans need to include appropriately detailed and accurate maps of t located within the area of the accident. These local maps are a crucial component of the emergency response planning proce emergency response itself. In addition to the exact path of each pipeline, which is shown on the maps, other system-specifi information for each pipeline, such as pipe diameter, operating pressure, product transported (by shipping name and 4-digit Department of Transportation Hazard Identification Code UN number²), depth (soil coverage), potential damage impact dist

(potential impact radius, defined in Title 49 Code of Federal Regulations 192.903), and specific emergency contact information (that is, telephone numbers), also is needed by emergency responders to plan and execute a timely and effective response to a pipeline emergency. At the National Transportation Safety Board's (NTSB) public hearing³ on the accident, which was held March 1-3, 2011, in Washington, DC, testimony of the chief of the San Bruno Fire Department (SBFD) indicated that before the accident, the SBFD was aware of the PG&E gas distribution system, but it was neither aware of nor had information about the natural gas transmission line that ruptured in the accident. The SBFD had not accessed the National Pipeline Mapping System that displays the location of the nation's natural gas transmission and hazardous liquid pipelines. The chief also indicated that since the accident, the SBFD has made contact with PG&E and obtained maps showing the locations of PG&E natural gas transmission pipelines. The PG&E program manager for safety, health, and claims testified that after the accident PG&E made maps of its natural gas transmission pipelines available to all of the communities and jurisdictions in which PG&E pipelines are located. When compared to distribution pipelines, transmission pipelines have different operating characteristics, such as pipeline diameter and operating pressures. Because of the differences in operating characteristics, transmission pipelines have different safety risks and concerns for the emergency response, including the pipeline company's ability to shut down the pipeline rapidly. NTSB investigations in all transportation modes have shown that the most successful emergency responses occur when the responders are prepared through training, drills, and exercises and have readily available information to assess the event. Prior to the accident, PG&E's public awareness program for emergency responders did not include identification of pipeline locations. At the NTSB's public hearing, the SBFD fire chief testified, "The benefit of having knowledge of the location of the pipelines [is] because it gives the fire service the ability to pre-plan, to do scenario-based training." The U.S. Department of Transportation has established regulations and programs aimed at providing information to responders (for example, pipeline markers, pipeline maps, railcar and truck placards). First responders can provide timely and valuable information to pipeline operators for the emergency response only when the responders know that a pipeline is involved and the name of the pipeline operator.

Recommendation:

TO THE CALIFORNIA PUBLIC UTILITIES COMMISSION: Require the Pacific Gas and Electric Company to correct all deficiencies identified as a result of the San Bruno, California, accident investigation, as well as any additional deficiencies identified through the comprehensive audit recommended in Safety Recommendation P-11-22, and verify that all corrective actions are completed.

Rec #: P-10-005
NTSB Status: Open - Acceptable Response
Issue date: 1/3/2011
Accident Date: 9/9/2010
Source Event:
Location: San Bruno California

Mode: Pipeline
Most Wanted List: No
Closed date:
Report Number:
Accident ID: DCA10MP008

Rec: P-10-005 Rec Status: Open - Acceptable Response
 TO THE CALIFORNIA PUBLIC UTILITIES COMMISSION: Develop an implementation schedule for the requirements of Safety Recommendation P-10-2 (Urgent) to Pacific Gas and Electric Company (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, for PG&E natural gas transmission lines in class 3 and class 44 locations and class 1 and class 25 high consequence areas⁶ that have not had a maximum allowable operating pressure established through prior hydrostatic testing as outlined in Safety Recommendation (P-10-2) (Urgent) to PG&E. These records should be traceable, verifiable, and complete; should meet your regulatory intent and requirements; and should have been considered in determining maximum allowable operating pressures for PG&E pipelines. (Urgent).

Addressee: State of California, Public Utilities Commission
Status: Open - Acceptable Response

Background Synopsis:

On September 9, 2010, about 6:11 p.m. Pacific daylight time,¹ a 30-inch-diameter natural gas transmission pipeline (Line 132) owned and operated by Pacific Gas and Electric Company (PG&E) ruptured in a residential area in the city of San Bruno, California. The accident killed eight people, injured many more, and caused substantial property damage. The rupture on Line 132 occurred near milepost 39.33, at the intersection of Earl Avenue and Glenview Drive in San Bruno. About 47.6 million standard cubic feet of natural gas were released as a result of the rupture. The rupture created a crater about 72 feet long by 26 feet wide. A ruptured pipe segment about 28 feet long was found about 100 feet away from the crater. The released natural gas was ignited sometime after the rupture; the resulting fire destroyed 37 homes and damaged 18.

Recommendation:

TO THE CALIFORNIA PUBLIC UTILITIES COMMISSION: Develop an implementation schedule for the requirements of Safety Recommendation P-10-2 (Urgent) to Pacific Gas and Electric Company (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, for PG&E natural gas transmission lines in class 3 and class 44 locations and class 1 and class 25 high consequence areas⁶ that have not had a maximum allowable operating pressure established through prior hydrostatic testing as outlined in Safety Recommendation (P-10-2) (Urgent) to PG&E. These records should be traceable, verifiable, and complete; should meet your regulatory intent and requirements; and should have been considered in determining maximum allowable operating pressures for PG&E pipelines. (Urgent).

Rec #: P-10-006
NTSB Status: Open - Acceptable Response
Issue date: 1/3/2011
Accident Date: 9/9/2010
Source Event:
Location: San Bruno California

Mode: Pipeline
Most Wanted List: No
Closed date:
Report Number:
Accident ID: DCA10MP008

Rec: P-10-006 **Rec Status: Open - Acceptable Response**
TO THE CALIFORNIA PUBLIC UTILITIES COMMISSION: If such a document and records search cannot be satisfactorily completed, provide oversight to any spike and hydrostatic tests that Pacific Gas and Electric Company is required to perform according to Safety Recommendation (P-10-4). (Urgent)

Addressee: State of California, Public Utilities Commission
Status: Open - Acceptable Response

Background Synopsis:

On September 9, 2010, about 6:11 p.m. Pacific daylight time, a 30-inch-diameter natural gas transmission pipeline (Line 1 and operated by Pacific Gas and Electric Company (PG&E) ruptured in a residential area in the city of San Bruno, California. killed eight people, injured many more, and caused substantial property damage. The rupture on Line 132 occurred near milepost 39.33 at the intersection of Earl Avenue and Glenview Drive in San Bruno. About 47.6 million standard cubic feet of natural gas were released as a result of the rupture. The rupture created a crater about 72 feet long by 26 feet wide. A ruptured pipe segment about 28 feet long was found about 100 feet away from the crater. The released natural gas was ignited sometime after the rupture; the result destroyed 37 homes and damaged 18.

Recommendation:

TO THE CALIFORNIA PUBLIC UTILITIES COMMISSION: If such a document and records search cannot be satisfactorily completed, provide oversight to any spike and hydrostatic tests that Pacific Gas and Electric Company is required to perform according to Safety Recommendation (P-10-4). (Urgent)

Rec #: P-10-007
NTSB Status: Closed - Acceptable Action
Issue date: 1/3/2011
Accident Date: 9/9/2010
Source Event:
Location: San Bruno California

Mode: Pipeline
Most Wanted List: No
Closed date: 3/29/2011
Report Number:
Accident ID: DCA10MP008

Rec: P-10-007 **Rec Status: Closed - Acceptable Action**
TO THE CALIFORNIA PUBLIC UTILITIES COMMISSION: Through appropriate and expeditious means, including posting on your website, immediately inform California intrastate natural gas transmission operators of the circumstances leading up to and the consequences of the September 9, 2010, pipeline rupture in San Bruno, California, and the National Transportation Safety Board's urgent safety recommendations to Pacific Gas and Electric Company so that pipeline operators can proactively implement corrective measures as appropriate for their pipeline systems. (Urgent)

Addressee: State of California, Public Utilities Commission
Status: Closed - Acceptable Action

Background Synopsis:

On September 9, 2010, about 6:11 p.m. Pacific daylight time, a 30-inch-diameter natural gas transmission pipeline (Line 132) owned and operated by Pacific Gas and Electric Company (PG&E) ruptured in a residential area in the city of San Bruno, California. The accident killed eight people, injured many more, and caused substantial property damage. The rupture on Line 132 occurred near milepost 39.33, at the intersection of Earl Avenue and Glenview Drive in San Bruno. About 47.6 million standard cubic feet of natural gas were released as a result of the rupture. The rupture created a crater about 72 feet long by 26 feet wide. A ruptured pipe segment about 28 feet long was found about 100 feet away from the crater. The released natural gas was ignited sometime after the rupture; the resulting fire destroyed 37 homes and damaged 18.

Recommendation:

TO THE CALIFORNIA PUBLIC UTILITIES COMMISSION: Through appropriate and expeditious means, including posting on your website, immediately inform California intrastate natural gas transmission operators of the circumstances leading up to and the consequences of the September 9, 2010, pipeline rupture in San Bruno, California, and the

National Transportation Safety Board's urgent safety recommendations to Pacific Gas and Electric Company so that pipeline operators can proactively implement corrective measures as appropriate for their pipeline systems. (Urgent)

Rec #: R-03-014
NTSB Status: Closed - Acceptable Action
Issue date: 8/21/2003
Accident Date: 2/1/2001
Source Event: Accident
Location: Los Angeles California

Mode: Rail
Most Wanted List: No
Closed date: 8/10/2004
Report Number: RAR-03-03
Accident ID: DCA01FR001

Rec: R-03-014 Rec Status: Closed - Acceptable Action

TO THE CALIFORNIA PUBLIC UTILITIES COMMISSION: Adopt comprehensive funicular design, construction, and operation regulations that include provisions for (1) emergency stopping under all foreseeable failure modes, (2) containment of passengers in the event of a collision, and (3) emergency ingress and egress for passengers and emergency responders.

Addressee: State of California, Public Utilities Commission
Status: Closed - Acceptable Action

Background Synopsis:

About 12:17 p.m. on February 1, 2001, the two cars of the Angels Flight funicular railway (Angels Flight) collided in downtown Los Angeles, California. The accident resulted in 7 injuries and 1 fatality among the 20 passengers aboard the two cars and injured a pedestrian. The Angels Flight Operating Company estimated monetary damage to the cars at \$370,000 with an additional \$1.2 million to replace the funicular haul system.

Recommendation:

TO THE CALIFORNIA PUBLIC UTILITIES COMMISSION: Adopt comprehensive funicular design, construction, and operation regulations that include provisions for (1) emergency stopping under all foreseeable failure modes, (2) containment of passengers in the event of a collision, and (3) emergency ingress and egress for passengers and emergency responders.

Rec #: R-03-015
NTSB Status: Closed - Unacceptable Action
Issue date: 8/21/2003
Accident Date: 2/1/2001
Source Event: Accident
Location: Los Angeles California

Mode: Rail
Most Wanted List: No
Closed date: 5/18/2010
Report Number: RAR-03-03
Accident ID: DCA01FR001

Rec: R-03-015 Rec Status: Closed - Unacceptable Action

TO THE CALIFORNIA PUBLIC UTILITIES COMMISSION: Before certifying Angels Flight to restart passenger service, independently verify that the drive system meets accepted industry standards and engineering practices and the funicular includes provisions for (1) emergency stopping under all foreseeable failure modes, including track brakes or some other independent backup system on the cars to prevent a runaway car if a failure occurs in the cable or its associated braking systems; (2) containment of passengers in the event of a collision; and (3) emergency egress and ingress for passengers and emergency responders.

Addressee: State of California, Public Utilities Commission
Status: Closed - Unacceptable Action

Background Synopsis:

About 12:17 p.m. on February 1, 2001, the two cars of the Angels Flight funicular railway (Angels Flight) collided in downtown Los Angeles, California. The accident resulted in 7 injuries and 1 fatality among the 20 passengers aboard the two cars and injuries to a pedestrian. The Angels Flight Operating Company estimated monetary damage to the cars at \$370,000 with an additional \$1.2 million to replace the funicular haul system.

Recommendation:

TO THE CALIFORNIA PUBLIC UTILITIES COMMISSION: Before certifying Angels Flight to restart passenger service, independently verify that the drive system meets accepted industry standards and engineering practices and the funicular includes provisions for (1) emergency stopping under all foreseeable failure modes, including track brakes or

some other independent backup system on the cars to prevent a runaway car if a failure occurs in the cable or its associated braking systems; (2) containment of passengers in the event of a collision; and (3) emergency egress and ingress for passengers and emergency responders.

Rec #: R-97-047
NTSB Status: Closed - Acceptable Action
Issue date: 9/16/1997
Accident Date: 4/26/1997
Source Event: Accident
Location: san francisco California

Mode: Rail
Most Wanted List: No
Closed date: 6/14/2001
Report Number:
Accident ID: LAX97FR007

Rec: R-97-047 **Rec Status: Closed - Acceptable Action**
THE NTSB RECOMMENDS THAT THE CALIFORNIA PUBLIC UTILITIES COMMISSION: CONDUCT, WITH THE SAN FRANCISCO MUNICIPAL RAILWAY & AN INDEPENDENT SAFETY AUDITING ORGANIZATION, A COMPREHENSIVE SAFETY REVIEW OF THE SAN FRANCISCO MUNICIPAL RAILWAY OPERATIONS & INFRASTRUCTURE THAT INCLUDES: 1) AN AUDIT & EVALUATION OF YOUR MANAGEMENT STRUCTURE, MAINTENANCE PROGRAMS, & OPERATING PROCEDURES TO DETERMINE WHETHER EMPLOYEE TRAINING, OPERATING RULES ENFORCEMENT, & TRANSIT OPERATIONS OVERSIGHT ARE ADEQUATE TO ENSURE PASSENGER SAFETY; & 2) THE DEVELOPMENT & IMPLEMENTATION OF RECOMMENDATIONS TO CORRECT DEFICIENCIES IDENTIFIED IN INDEPENDENT SAFETY REVIEW.

Addressee: State of California, Public Utilities Commission
Status: Closed - Acceptable Action

Background Synopsis:

ABOUT 6:30 A.M. ON 4/26/97, A SAN FRANCISCO MUNICIPAL RAILWAY (MUNI) LIGHT RAIL VEHICLE (LRV) TRAIN WAS INVOLVED IN AN ACCIDENT AT OCEAN AVENUE IN SAN FRANCISCO, CALIFORNIA. THE TRAIN WAS IN NONREVENUE SERVICE (NO PASSENGERS). THE THIRD CAR, WHICH WAS THE LAST CAR OF THE TRAIN, DERAILED AT A SWITCH, RESULTING IN A COLLISION WITH A HANDICAPPED PASSENGER LOADING PLATFORM, DESTROYING THE CAR & THE PLATFORM. NO INJURIES WERE REPORTED; PROPERTY DAMAGE, INCLUDING REPLACEMENT OF THE LRV, EXCEEDED \$2.2 MILLION.

Recommendation:

THE NTSB RECOMMENDS THAT THE CALIFORNIA PUBLIC UTILITIES COMMISSION: CONDUCT, WITH THE SAN FRANCISCO MUNICIPAL RAILWAY & AN INDEPENDENT SAFETY AUDITING ORGANIZATION, A COMPREHENSIVE SAFETY REVIEW OF THE SAN FRANCISCO MUNICIPAL RAILWAY OPERATIONS & INFRASTRUCTURE THAT INCLUDES: 1) AN AUDIT & EVALUATION OF YOUR MANAGEMENT STRUCTURE, MAINTENANCE PROGRAMS, & OPERATING PROCEDURES TO DETERMINE WHETHER EMPLOYEE TRAINING, OPERATING RULES ENFORCEMENT, & TRANSIT OPERATIONS OVERSIGHT ARE ADEQUATE TO ENSURE PASSENGER SAFETY; & 2) THE DEVELOPMENT & IMPLEMENTATION OF RECOMMENDATIONS TO CORRECT DEFICIENCIES IDENTIFIED IN INDEPENDENT SAFETY REVIEW.

Rec #: R-91-049
NTSB Status: Closed - Acceptable Action
Issue date: 8/23/1991
Accident Date: 11/7/1990
Source Event: Accident
Location: CORONA California

Mode: Rail
Most Wanted List: No
Closed date: 11/6/2001
Report Number: RAR-91-03
Accident ID: DCA91MR002

Rec: R-91-049 **Rec Status: Closed - Acceptable Action**
THE NTSB RECOMMENDS THAT THE CALIFORNIA PUBLIC UTILITIES COMMISSION: IN COOPERATION WITH THE ATCHISON, TOPEKA AND SANTA FE RAILWAY CORPORATION (ATSF) AND THE CALIFORNIA STATE FIRE MARSHAL'S OFFICE, DEVELOP A COMPLETE LIST OF 24-HR. EMERGENCY PHONE NUMBERS FOR THOSE PIPELINE OPERATORS WHOSE TRANSMISSION LINES ARE NEAR ATSF PROPERTY.

Addressee: State of California, Public Utilities Commission
Status: Closed - Acceptable Action

Background Synopsis:

ON WEDNESDAY, NOVEMBER 7, 1990, ABOUT 4:11 A.M. PACIFIC STANDARD TIME, TWO ATCHISON, TOPEKA AND SANTA FE RAILWAY COMPANY (ATSF) FREIGHT TRAINS COLLIDED HEAD ON A MILEPOST (MP) 25.6 IN CORONA, CALIFORNIA. THE WESTBOUND ATSF FREIGHT TRAIN 818, WHICH WAS TRAVELING FROM BARSTOW, CALIFORNIA, TO HOBART YARD, CITY OF COMMERCE, CALIFORNIA, WAS ON THE CORONA SIDING. IT PASSED THE STOP SIGNAL,

AND THE LEAD LOCOMOTIVE REENTERED THE MAIN TRACK AREA, BLOCKING ALL MOVEMENT ON THE MAIN TRACK. THE EASTBOUND ATSF FREIGHT TRAIN 891, WHICH WAS TRAVELING FROM HOBART YARD TO CHICAGO, ILLINOIS, WAS ON THE MAIN TRACK AND COLLIDED WITH TRAIN 818. EACH TRAIN HAD THREE-PERSON CREWS.

Recommendation:

THE NTSB RECOMMENDS THAT THE CALIFORNIA PUBLIC UTILITIES COMMISSION: IN COOPERATION WITH THE ATCHISON, TOPEKA AND SANTA FE RAILWAY CORPORATION (ATSF) AND THE CALIFORNIA STATE FIRE MARSHAL'S OFFICE, DEVELOP A COMPLETE LIST OF 24-HR. EMERGENCY PHONE NUMBERS FOR THOSE PIPELINE OPERATORS WHOSE TRANSMISSION LINES ARE NEAR ATSF PROPERTY.

Rec #: R-90-052
NTSB Status: Closed - Unacceptable Action
Issue date: 12/13/1990
Accident Date: 3/7/1990
Source Event: Accident
Location: PHILADELPHIA Pennsylvania

Mode: Rail
Most Wanted List: No
Closed date: 4/4/2003
Report Number: RHR-90-01
Accident ID: DCA90MR003

Rec: R-90-052 **Rec Status: Closed - Unacceptable Action**
THE NTSB RECOMMENDS THAT THE CALIFORNIA PUBLIC UTILITIES COMMISSION: REQUIRE THE USE OF ACTIVE WARNING DEVICES IN ADVANCE OF RAILROAD/HIGHWAY GRADE CROSSING ACTUATED BY THE RAILROAD CROSSING WARNING SYSTEM WHERE SIGHT DISTANCES ARE FREQUENTLY REDUCED BY DENSE FOG.

Addressee: State of California, Public Utilities Commission
Status: Closed - Unacceptable Action

Background Synopsis:

ABOUT 9:38 A.M., PACIFIC STANDARD TIME, ON DECEMBER 19, 1989, NATIONAL RAILROAD PASSENGER CORPORATION (AMTRAK) PASSENGER TRAIN 708, CONSISTING OF ONE LOCOMOTIVE UNIT AND FIVE PASSENGER CARS, STRUCK A TAB WAREHOUSE & DISTRIBUTION COMPANY TRACTOR SEMITRAILER IN A DENSE FOG AT A HIGHWAY GRADE CROSSING NEAR STOCKTON, CALIFORNIA. THE GRADE CROSSING HAS FLASHING LIGHTS AND GATES THAT WERE FUNCTIONING AT THE TIME OF THE ACCIDENT. THE COLLISION DERAILED THE LOCOMOTIVE AND ALL FIVE PASSENGER CARS. A FIRE FOLLOWED THE TRAIN IMPACT WITH THE TRUCK. THE ENGINEER, FIREMAN, AND TRUCKDRIVER WERE KILLED IN THE COLLISION AND FIRE. THREE OF THE 7 TRAIN CREWMEMBERS AND 49 OF THE 150 PASSENGERS WERE INJURED. THE TOTAL ESTIMATED DAMAGE WAS \$2,435.000

Recommendation:

THE NTSB RECOMMENDS THAT THE CALIFORNIA PUBLIC UTILITIES COMMISSION: REQUIRE THE USE OF ACTIVE WARNING DEVICES IN ADVANCE OF RAILROAD/HIGHWAY GRADE CROSSING ACTUATED BY THE RAILROAD CROSSING WARNING SYSTEM WHERE SIGHT DISTANCES ARE FREQUENTLY REDUCED BY DENSE FOG.

Rec #: P-82-004
NTSB Status: Closed - Acceptable Action
Issue date: 4/16/1982
Accident Date: 8/25/1981
Source Event: Accident
Location: San Francisco California

Mode: pipeline
Most Wanted List: No
Closed date: 5/11/1988
Report Number: PAR-82-01
Accident ID: DCA81MP020

Rec: P-82-004 **Rec Status: Closed - Acceptable Action**
AS A RESULT OF ITS INVESTIGATION OF THIS ACCIDENT, THE NTSB RECOMMENDS THAT THE PUBLIC UTILITY COMMISSION OF THE STATE OF CALIFORNIA: REQUEST THE CALIFORNIA STATE LEGISLATURE TO ENACT LEGISLATION TO REQUIRE PERSONS EXCAVATING OR DISCHARGING EXPLOSIVES NEAR UNDERGROUND UTILITIES, OR DEMOLISHING BUILDINGS CONTAINING UTILITIES, TO NOTIFY OPERATORS OF PUBLIC UTILITIES IN ADVANCE USING ONE-CALL NOTIFICATION SYSTEMS WHERE THEY ARE ESTABLISHED.

Addressee: State of California, Public Utilities Commission
Status: Closed - Acceptable Action

Background Synopsis:

ON AUGUST 25, 1981, IN DOWNTOWN SAN FRANCISCO, CALIFORNIA, A 16-INCH NATURAL GAS MAIN OWNED BY THE PAC

AND ELECTRIC COMPANY (PG & E) WAS PUNCTURED BY A DRILL THAT AN EXCAVATION CONTRACTOR WAS USING TO SET TIEBACKS FOR ANCHORING HIS EXCAVATION SHORING. ESCAPING NATURAL GAS BLEW UPWARD AND CARRIED INTO THE EMBARCADERO COMPLEX AND OTHER NEARBY BUILDINGS. THERE WAS NO IGNITION; HOWEVER, THE GAS STREAM ENTRAINED AN OIL CONTAINING POLYCHLORINATED BIPHENYL (PCB). FALL-OUT AFFECTED AN EIGHT-SQUARE-BLOCK AREA OF THE CITY'S FINANCIAL DISTRICT COVERING BUILDINGS, CARS, TREES, PEDESTRIANS, POLICE, AND FIREMEN. APPROXIMATELY 30,000 PERSONS WERE SAFELY EVACUATED FROM THE AREA IN 45 MINUTES. NO ONE WAS KILLED OR SERIOUSLY INJURED, ALTHOUGH MANY PERSONS WERE SPRAYED WITH THE PCB OIL MIST.

Recommendation:

AS A RESULT OF ITS INVESTIGATION OF THIS ACCIDENT, THE NTSB RECOMMENDS THAT THE PUBLIC UTILITY COMMISSION OF THE STATE OF CALIFORNIA: REQUEST THE CALIFORNIA STATE LEGISLATURE TO ENACT LEGISLATION TO REQUIRE PERSONS EXCAVATING OR DISCHARGING EXPLOSIVES NEAR UNDERGROUND UTILITIES, OR DEMOLISHING BUILDINGS CONTAINING UTILITIES, TO NOTIFY OPERATORS OF PUBLIC UTILITIES IN ADVANCE USING ONE-CALL NOTIFICATION SYSTEMS WHERE THEY ARE ESTABLISHED.