California State Senate

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ENERGY, UTILITIES, AND COMMUNICATION
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SUBCOMMITTEE ON GAS AND ELECTRIC INFRASTRUCTURE SAFETY

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EXCAVATION DAMAGE: A Safety Threat or Cost of Doing Business?

Since the natural gas pipeline explosion in San Bruno, California, there has been a heightened awareness of our underground infrastructure. Gas leaks and excavation damage reports have made regular appearances in Bay Area television news programs and the pages of the San Francisco Chronicle and the San Jose Mercury News.

The goals of this hearing are to explore three questions:

1) ***Is excavation safer now than it was three decades ago, before state laws for damage prevention?***
2) ***Why is excavation safety still an issue, with current laws, training standards, and new technologies?***
3) ***What is the source of California's infrequent prosecution of excavation safety violations, and is our enforcement regime effective in promoting safety?***

Excavation damage is the number one cause of gas pipeline safety accidents. Pipelines, however, are not the only underground facilities of concern when excavating. Unsafe excavation near underground electric lines can injure workers, cut telecommunications fiber can knock out 911 services, and ruptured water lines can impact water quality and lead to sinkholes. Even when not injurious, damage to underground facilities, which are often located under streets, can be expensive and cause service outages.

To minimize the chance of inadvertently hitting underground facilities, utilities around the country organized to provide one-call centers, a place for excavators to call before digging. The call centers will then alert the utilities with underground facilities in the area, and within 48 hours the utilities mark the location of their facilities in the proposed excavation area (usually in paint, if on pavement), aiding excavators in avoiding those buried pipes and conduits.

California has two one-call centers—Underground Service Alert—North (USA North) and South (DigAlert)—that provide this service. Excavators are able to dial 811 and be routed to their nearest call center. The Common Ground Alliance (CGA), a partnership of operators and excavators, launched an education campaign in 2007 to get out the word. The following is a bumper sticker from the campaign:

http://www.call811.com/campaign-materials/resources/BUMPERSTICKER_HIRES.pdf

Just having the call centers available, however, is no guarantee that excavators will use them, nor does it ensure that utilities will correctly mark their underground facilities, nor does it ensure safe excavation practices even if the facilities are correctly marked. Numerous state laws have attempted to address these gaps.

Safe excavation requires the participation of a diverse and segmented host of interested parties:

- Facilities owners that design, install, and maintain underground infrastructure. This can include gas and electric utilities—both investor-owned and municipal—telecommunications providers, private corporations such as petroleum refiners, municipal water and sewer utilities, and transportation departments.
- Excavators, which may be union or non-union and may contract with any of the facilities owners. Excavators may also include farmers and homeowners.
- Locators, who have specialized training and tools to find underground facilities and may be employed by facilities owners or contract with them.
- Insurance companies who insure the facilities, the contractors, and the property upon which the facilities are located.
- One-call communications services that coordinate digging notifications.
- State regulators, who often have piecemeal and sometimes overlapping jurisdiction over the various other interested parties.

Effective protection from excavation damage will only occur with full participation and shared responsibility of these entities.

IS EXCAVATION ANY SAFER NOW THAN IN 1984, WHEN CALIFORNIA'S FIRST DAMAGE PREVENTION LAW WAS PASSED?

Appendix 1 highlights a number of tragic accidents that have spurred state and federal efforts to improve excavation safety. A 1988 Special Report of the Transportation Research Board of the National Research Council noted that the most common cause of pipeline accidents was excavation damage.[1] California's excavation safety code took its current form (subject to small modifications) the next year, with AB 73 (Elder, Stats of 1989, Chp 928),[2] which included mandatory participation of all owners of subsurface infrastructure (except Caltrans) in the one-call centers, mandatory calling before excavation, use safe excavation practices, and penalties for non-compliance.

It is unclear if excavation safety has improved since the passage of AB 73. Southern California Gas Company, in its support for AB 73, had claimed that its facilities had been damaged by excavators over 1,000 times, and that in 70% of those instances no notification had been given to the utility. In March of 2013 PG&E reported that in 2012 contractors and homeowners damaged PG&E facilities 1,750 times, and of those over 1,000 occurred when the excavator did not call the one-call center beforehand.[3]

Since 1989, there have been modifications to the law to improve it. Initiatives at the federal level have created entities such as the Common Ground Alliance (CGA), a partnership of excavators and utilities that develops and publicizes best practices. The hodgepodge of one-call center telephone numbers have been consolidated into a nationwide number to call before you dig—811. Both facility location and excavation technology have improved. ***Despite all these efforts, has excavation safety truly improved?*** Appendix 2 highlights a number of recent near-disasters in California.

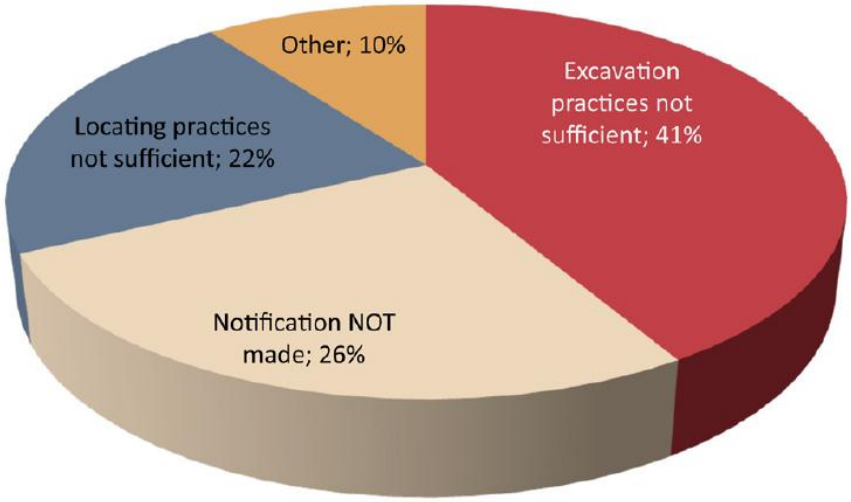
WITH SO MANY TRAINING MATERIALS, COURSES, AND OTHER OPPORTUNITIES, WHY DO WE STILL HAVE PROBLEMS WITH NO-CALL EXCAVATIONS, MISMARKED FACILITIES, AND DAMAGES CAUSED BY POOR EXCAVATION PRACTICES?

According to CGA, 26% of damages to underground facilities nationwide were associated with the excavator not notifying the one-call center, hence not allowing utilities to have their underground facilities marked. Farmers and homeowners are identified as often not calling before digging, likely because many states—including California—do not require homeowners

[1] Special Report 219, *Pipelines and Public Safety: Damage Prevention, Land Use, and Emergency Preparedness*. Transportation Research Board, Washington, D.C., 1998.
[2] Government Code §4216-4216.9.
[3] PG&E, "During Safe Digging Month, PG&E Reminds Customers to Call 811," *Currents*, March 4, 2013.

to call 811 to get facilities marked. The largest number of no-call excavation damages is, however, from the contractor/developer category and represent 20% of damages in that category.[4]

There is no data on how many successful excavations are accomplished without calling, nor do we appear to have California-specific data aside from what data is collected by the utilities on their own facilities. Data collected by CGA is done on a nationwide basis through anonymous, voluntary submission to its online Damage Incident Reporting Tool (DIRT).



From: *Common Ground Alliance DIRT, Analysis and Recommendations, September 2012*

A significant proportion of damages are caused by poor facility location and poor excavation practices. Such problems do not appear to be a result of the lack standards or a lack of educational or training opportunities. The National Utility Locating Contractors Association (NULCA) has developed a set of minimum standards for its members to adopt as part of their training program contained in its Locator Training Standards and Practices booklet. Their training program includes over 100 hours of training in system design, construction standards, equipment techniques, locating theory, and safety procedures. OSHA (federal) supplies a booklet, *Excavations*, that assists excavation firms and contractors in protecting workers from excavation hazards. California's One-Call Centers provide training to excavators upon request to explain the law and the one-call process.

While it is not clear which damage category can benefit most from increased focus—whether that focus be educational or enforcement—the fact that all three causes have a similar proportion of accidents suggests that, if one area is a problem, likely all three are problems.

Data and information submitted by PG&E and AT&T suggest that the most active excavation firms have lower dig-in rates than less active firms or ones who have recently moved into the state, which may provide an opportunity for increased focus.

[4] *CGA DIRT: Analysis and Recommendations*. Common Ground Alliance, Vol. 9, September 2012.

Data provided by Southern California Gas Company (SoCal Gas) and San Diego Gas and Electric (SDG&E) indicate that fully 50% of damages in 2012 were caused by the excavator failing to call 811. SDG&E finds that the next greatest cause of damage is a failure to use hand tools when required (31%), and SoCal Gas finds a similarly large proportion of damages from hand tools and from backhoes. Both utilities find insufficient facility locating to be considerably less of a problem than reported nationally in CGA's DIRT Report (pie graph above).

HOW USEFUL IS A PENALTY THAT IS NEVER USED?

Before the passage of AB 73 in 1989, the maximum penalty for non-compliance with GOV 4216 was $5,000. DigAlert, the sponsor of AB 73, had noted that since the introduction of the law (1984), no sanctions had been sought for violations. The Senate Local Government Committee analysis noted that some parties thought the violation amount too small to compel compliance.

AB 73 attempted to remedy this problem by increasing fines to a maximum of $10,000 for negligence and $50,000 for willfully and knowingly violating the law. To provide incentives for law enforcement, the Attorney General, district attorney, or local agency that issued the permit could keep any fine money collected instead of sending it to the General Fund. In the intervening years, however, it is not clear that sanctions have been sought under this section other than after the 2004 explosion in Walnut Creek (Appendix 1).

No definitive correlation exists between the potential size of a fine and compliance with statute. The National Transportation Safety Board (NTSB) in its comprehensive 1997 study noted that Massachusetts hands out small penalties of $200 to $1,000, and excavation damages have dropped dramatically. In contrast, Connecticut has had the ability to fine excavators up to $10,000, though the severity of the fine appeared to have discouraged its use.[5]

Both NTSB and CGA[6] note that administrative sanctions appear to be more effective in affecting compliance than relying enforcement through the courts. NTSB suggests, however, that some states such as Pennsylvania have successfully integrated small administrative penalties and larger civil penalties handled by the Attorney General.

California's one-call laws are only enforceable by Attorney General, district attorney, or local agency that issued the permit. Other agencies nonetheless have some enforcement authority over different aspects of and actors in excavation safety. Federal law establishes minimum standards for damage prevention programs of pipeline operators,[7] enforced by the California Public Utilities Commission and the Office of the State Fire Marshal. Regulations covering excavation

[5] National Transportation Safety Board. *Protecting Public Safety Through Excavation Damage Prevention.* Safety Study NSTB/SS-97/01, Washington, DC, 1997, p. 22.
[6] *Best Practices 10.0*. Common Ground Alliance, 2013, p. 67.
[7] Title 49 Code of Federal Regulations, sections 192.614 (gas pipeline operators) and 195.442 (hazardous liquid pipeline operators.

safety as pertains to worker safety are enforced by CalOSHA.[8] The Contractor's State Licensing Board (CSLB) handles complaints against contractors and has the ability to fine and suspend licenses.

The other half of the equation is reporting of potential violations. The district attorneys have noted that few if any cases have been referred to them for prosecution. Similarly, complaints to CSLB regarding excavation damage need to be accompanied by sufficient evidence to warrant citation.

Do California agencies and prosecutors need more tools (or more potent tools) to enforce compliance with excavation safety laws? Better coordination? Or do affected parties need to pursue enforcement more vigorously?

CLOSING THOUGHTS

California law appears to cover many of the elements needed for an effective damage prevention program, but little data exists to evaluate the state's effectiveness. Additionally, the apparent dearth of enforcement of state law by our fragmented regulatory scheme suggests that, while everyone is responsible for excavation safety, enforcement of excavation damage slips through the cracks.

The federal pipeline regulator is considering a rule, pursuant to the 2006 PIPES Act,[9] that would determine the effectiveness of a state's damage prevention program.[10] The proposed criteria for evaluating a state's damage prevention program are listed in Appendix 3.

The witnesses for the hearing may wish to opine whether or not safety has suffered for lack of state-level attention, and if so, what the state's role should be in improving safety.

Primary References:

National Transportation Safety Board. *Protecting Public Safety Through Excavation Damage Prevention.* Safety Study NSTB/SS-97/01, Washington, DC, 1997.

Best Practices 10.0. Common Ground Alliance, 2013.

CGA DIRT: Analysis and Recommendations. Common Ground Alliance, Vol. 9, September 2012.

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Hearing Date: June 4, 2013

[8] California Code of Regulations, Title 8, Section 1541.
[9] Pipeline Inspection, Protection, Enforcement, and Safety Act of 2006. 120 Stat. 3486, December 29, 2006.
[10] Federal Register, Vol. 77, No. 63, April 2, 2012, 19800-19834.

Appendix 1:

Despite the prevalence of one-call centers, fatal accidents continue to occur. The following is a sampling of excavation accidents; in all but the first a one-call center was available:

- In June of 1976, a construction crew working on Venice Blvd. in **Culver City** hit a petroleum pipeline. The explosion killed nine people and an entire city block was burned to the ground. Southern California's one-call center (DigAlert) was created three months later.
- In March 1994, a transmission pipeline accident in **Edison, New Jersey** injured 112 persons, destroyed eight buildings, and resulted in the evacuation of 1,500 apartment residents. NTSB found the probable cause to have been excavation damage to the pipe.
- In June 1994, a gas explosion in **Allentown, Pennsylvania**, resulted in 1 fatality and 66 injuries. NTSB concluded that the accident was caused by a service line that had been exposed during excavation and had subsequently separated at a compression coupling.
- On November 21st, 1996, a propane gas explosion in a shopping district of **San Juan, Puerto Rico**, resulted in 33 fatalities and 69 injuries when gas built up in a basement after an excavation-caused leak.
- On November 9th, 2004, an excavator on a backhoe hit a 10-inch petroleum pipeline in **Walnut Creek**, igniting the fuel, resulting in 5 fatalities and 4 injuries. The cause was found to be an inadequate marking of the pipe's location.
- On February 19th, 2013, an explosion at a **Kansas City** restaurant killed 1 and injured 15 after a construction crew hit a gas line. The investigation is ongoing, but the utility failed to shut of the flow of gas for about 1 hour between notification and the explosion.

Appendix 2:

It is difficult to determine the scope of the problem from a collection of tragic anecdotes, but California has recently had a number of near-miss incidents, the following of which are a sampling that attracted media attention:

- On November 6th, 2011, PG&E was conducting a water pressure test on the gas pipeline that had exploded a year earlier, south of the San Bruno explosion site in nearby **Woodside**. The pipe ruptured, causing a mudslide that shut down I-280 for four hours. A dent was found at the point of rupture, caused by an unknown, unreported excavation accident.
- On June 28, 2012, power pole work in **San Joaquin County** caused the severing of an underground fiber optic cable, resulting in a 911 outage as well as internet, land line, and cellular service disruption in **Amador County**. Full system function wasn't restored for more than 24 hours.
- On August 2nd, 2012, an excavator clipped a gas line with a backhoe at the same intersection which had erupted in the September 2010 explosion in **San Bruno**, prompting evacuations. The contractor had failed to use proper excavation techniques.
- On March 12th, 2013, a **Berkeley** homeowner hired a day laborer to do sewer work, who hit the gas line with a pick, igniting the gas and burning the front of a home and a van parked outside. No call was made to have gas lines marked.
- On March 15th, 2013, a subcontractor punctured a steel pipe in **Fresno**, causing the evacuation of over 300 homes and businesses. Excavation was faulty for numerous reasons.
- On April 24th, 2013, a pavement recycling vehicle hit a 3-inch natural gas line in **Bakersfield**, causing an explosion that engulfed the vehicle in flames. No one was injured. The excavator appeared to follow applicable laws and protocols, but the gas line was much closer to the road surface than expected. The pipeline operator maintains that hand-digging was required to locate the pipe depth.

Appendix 3:

The following is from the April 4th, 2012 federal Pipeline and Hazardous Materials Administration (PHMSA) Notice of Proposed Rulemaking: Proposed Criteria by which PHMSA will evaluate state excavation damage prevention law enforcement programs.[11]

PHMSA is seeking comments on using the following criteria to evaluate the effectiveness of a state's damage prevention enforcement program:

1. Does the state have the authority to enforce its state excavation damage prevention law through civil penalties?
2. Has the state designated a state agency or other body as the authority responsible for enforcement of the state excavation damage prevention law?
3. Is the state assessing civil penalties for violations at levels sufficient to ensure compliance and is the state making publicly available information that demonstrates the effectiveness of the state's enforcement program?
4. Does the enforcement authority (if one exists) have a reliable mechanism (e.g., mandatory reporting, complaint-driven reporting, etc.) for learning about excavation damage to underground facilities?
5. Does the state employ excavation damage investigation practices that are adequate to determine the at-fault party when excavation damage to underground facilities occurs?
6. At a minimum, does the state's excavation damage prevention law require the following?
    a. Excavators may not engage in excavation activity without first using an available one-call notification system to establish the location of underground facilities in the excavation area.
    b. Excavators may not engage in excavation activity in disregard of the marked location of a pipeline facility as established by a pipeline operator.
    c. An excavator who causes damage to a pipeline facility:
        i. Must report the damage to the owner or operator of the facility at the earliest practical moment following discovery of the damage; and,
        ii. If the damage results in the escape of any flammable, toxic, or corrosive gas or liquid that may endanger life or cause serious bodily harm or damage to property, must promptly report to other appropriate authorities by calling the 911 emergency telephone number or another emergency telephone number.
7. Does the state limit exemptions for excavators from its excavation damage prevention law? A state must provide to PHMSA a written justification for any exemptions for excavators from state damage prevention requirements. PHMSA will make the written justifications available to the public.

[11] Federal Register, Vol. 77, No. 63, April 2, 2012, pp. 19800-19834.