
California Underground Facilities Safe Excavation Board
("Dig Safe Board")

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Agenda Item No. 5 (Information Item) – Staff Report

Abandoned Underground Facilities in California: The Present and The Future

PRESENTERS

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SUMMARY

The Board's 2020 Annual Plan and Strategic Plan both highlight the current and future problems that abandoned buried facilities present. Members and the public have discussed the issue at several board meetings. Board Investigators have highlighted several dig-in incidents involving abandoned facilities. Based on data analysis and investigation analysis, staff recommends the Board solicit public discussion of the problem and an investigation into possible solutions.

Discussion participants may wish to consider the following questions:

1. *Do you find abandoned lines to be a problem that needs addressing?*
2. *For what reason might you abandon a line?*
3. *How is ownership of abandoned lines managed?*
4. *What would a solution to the problem look like from your perspective?*
5. *If a solution is needed, who needs to be involved in its development?*

STRATEGIC PLAN

2020 Strategic Objective: Improve Excavation and Location Practice Safety

Strategic Activity: Developing a Process for Recording Location Information of Lines
Prior to Abandonment

BACKGROUND

The Dig Safe Act of 2016 (SB 661, Chapter 809, Statutes of 2016) required operators to maintain records of their abandoned lines and required them to mark an "A" inside a circle known abandoned lines in areas delineated for excavation (Government Code § 4216.3). The Board's draft Strategic Plan referenced studies of how an operator's access to accurate information can be hampered by a multitude of ownership changes having left original records in disarray, the original drawings being referenced to roads, trees, buildings, and parking lots that are either no longer present or appreciably changed since facility

installation, and abandoned line records that are either not kept or not changed to recognize the lines as abandoned.¹ The Board recognized abandoned lines as a prevalent safety hazard in its 2020 Plan, as these lines may often be confused for active, marked lines. While abandoned lines have been discussed in the context of other Board initiatives, the topic has not yet been the subject of inquiry.

DISCUSSION

The Problem

Abandoned buried facilities can represent a danger to construction crews, California's infrastructure, and the public. Current law does not direct the disposition of abandoned buried utility lines in California once they are exposed, oftentimes accompanying a dig-in event. Utilities have installed more and more underground facilities and excavation crews have begun to encounter not only abandoned utilities but also unmarked ones, leading to the danger of mistaking an unmarked line as abandoned when it could be a live facility.

With infrastructure investment projects in water, electric, communications, and gas service, more facilities are being buried underground today than ever before. Directional drilling technology refined over the last few decades makes installation cheaper than ever. California law does not establish requirements for the collection, maintenance, and transfer of abandoned location information in any consistent manner. When abandoned lines are exposed or damaged it can lead to costly project delays, damage to existing infrastructure, and use of public resources to resolve the incident.

The Board is perhaps in the position to bring awareness, concern, and discussion about the impact of abandoned facilities on construction workers, the public, and existing infrastructure. A better understanding is necessary of why facilities are abandoned how their ownership status' change upon abandonment before solutions may be pursued.

Other States:

Many states have provisions in their law to address the abandonment of facilities in state rights-of-way. An outline of several state laws may be found in **Attachment A**. The biggest commonality between the different states' policies is that the facility owner continues to own the facility after abandoning it and has the responsibility for locating it. The owner is also responsible for the cost of removal to allow for new construction should it be deemed necessary. The expense of locating the facility after abandonment may be seen as much cheaper than removing the facility entirely. It should be noted that many of these policies just apply to facilities located in state highway rights-of-way.

In November, 2007, the Hawaii Department of Transportation surveyed other U.S. States to inform development of their own policy on abandoned buried utilities. Hawaii received 16 responses to the survey varying in length and capacity. Several policies of the same States who responded are highlighted in this staff report.

¹ Transportation Research Board, National Academies of Sciences, Engineering, and Medicine, *Encouraging Innovation in Locating and Characterizing Underground Utilities*, National Academies Press, 2009, p. 18. <https://www.nap.edu/catalog/22994/encouraging-innovation-in-locating-and-characterizing-underground-utilities>

The federal Pipeline and Hazardous Material Safety Administration (PHMSA) also has abandonment guidelines for transmission gas and hazardous material pipelines.² These pipelines have already been mapped in the National Pipeline Mapping System (NPMS), and the abandonment status is added to the existing GIS data.

Board Investigations:

In 2019, the Division of Investigations had 19 investigations that involved confirmed abandoned lines. Below are three examples.

- **Case Example #1:** 10 inch Abandoned gas line was struck in agricultural area during ripping operations. The excavator had a valid USA ticket.

The damage resulted in project delay for the excavator. The excavator reported the exposure to the regional notification center and relied upon the various responding locators to confirm ownership. The excavator initially had no idea if it was a live, abandoned, or out-of-service facility. The agriculture equipment was damaged and required costly repairs.

- **Case Example #2:** Construction crew struck an unmarked communication conduit with fiber-optic line inside. The excavator had a valid USA ticket.

The municipality responded and stated it was not on their maps and was most likely an abandoned traffic light signal. The municipality instructed the excavator to cut the line and continue working. Immediately after the line was cut a local Police Department satellite office lost all data connectivity. An out-of-date map coupled with an assumption of the facility being an abandoned line led to a potentially dangerous service outage for a vital public safety resource.

- **Case Example #3:** Horizontal boring crew struck an abandoned buried facility at a commercial port which resulted in a small amount of residual diesel fuel spilling out. The excavator had a valid USA ticket.

Cal OES issued a control number due to possible HAZMAT release. The excavator stopped work for multiple days. Old maps from the City had to be requested and acquired. It was determined that was the facility was an old 8” oil line converted to use for diesel refueling of train locomotives and was owned by an operator who no longer exists. A 50-foot section of pipe was cut and removed by the excavator and capped on each end to allow for the new construction.

Possible Directions:

Data analysis and investigation analysis shows that any solution to the problem of abandoned underground facilities must include provisions regarding facility ownership and responsibility to ensure the facility can be completely removed or at minimum located

² Both are found in Title 49 of the Code of Federal Regulations. Natural gas transmission: 49 CFR 192.727. Hazardous liquid: 49 CFR 195.59.

accurately at the owner's expense. The following represent a breadth of possible solutions, each with their own set of costs and benefits.

1. **All operators remove their abandoned lines.**
 - This is the most expensive option, and in many places, such as crowded downtown areas, may be so cost-prohibitive and disruptive as to not be viable.
2. **Excavators share locations of discovered abandoned lines with the corresponding municipal/local engineering department and/or Regional Notification Centers.**
 - The owners of the facility, if known, would have to be involved in this process and would be supplied the locations for their own records and locating purposes.
3. **Utility operators and municipalities/local governments share local mapping data regarding known lines, live and abandoned.**
 - There are privacy, security, and legal ramifications to this option that will need to be explored.
4. **Create a Statewide abandoned line database with information available to excavators and the public regarding the locations of known abandoned lines.**
 - This option raises the question of who houses the data and by what standards may it be submitted and accessed.
5. **Require the use of new technology to locate live and abandoned facilities.**
 - GIS coordinate "tagging" has been widely discussed as a potential requirement for all newly installed buried facilities. SB 865 (currently in the Senate Appropriations Committee) proposes to amend Gov't Code § 4216.3 with the following language:

"Commencing January 1, 2021, all new subsurface installations shall be tagged with GIS coordinates and maintained as permanent records of the operator."

This practice could also be applied to and newly discovered subsurface abandoned facilities as well. The sharing of the GIS data would need to be determined and could be used in combination with options 2 and 3 above.

- EMS Electronic Markers. The electronic marker system is intended to make the job of locating underground facilities easier. The basic component of the system is a durable electronic marker buried above underground facilities during their construction or maintenance. They may also be placed upon exposure of an unmarked abandoned line. Power markers consist of a sealed shell containing a passive antenna. The locator sends a signal to the marker that energizes it and the signal is reflected to the locator. There is also EMS rope/tape that works in the same way and can be laid directly along/over the facility. The rope has electronic markers woven into the strands and placed every so often along the length of the rope. It is more durable and accurate but more costly than conventional tracer wire.

One or more of these options may be viable. All require expense, effort, and some sort of policy action be it a regulation, standard, or amendment to Gov't Code § 4216 *et seq.* What is clear, however, is that developing a solution will require the participation of excavators, operators, municipalities, state agencies, and technology providers to develop viable options and may require partners in the Legislature to assist in executing them.

Creative options may emerge from these discussions, such as grants for utility operators and excavators to install technological improvements, municipalities upgrading GPS/mapping systems, and the creation of an abandoned line database.

RECOMMENDATION

Staff recommends the Board solicit public discussion and an examination of possible directions, including the identification of participants required to advance the discussion. The Board may wish to solicit further data gathering using tools such as surveys and online workshops to solicit ideas.

ATTACHMENTS:

- A: Other State Laws
- B: Presentation Slides

ATTACHMENT A: OTHER STATE LAWS

Several states have statutes, regulations, and guidelines regarding abandoned lines. The following list is not exhaustive.

- **Arizona DOT Guideline for Accommodating Utilities on Highway Rights-of-Way**
Section 5: “Abandonment of Utility Facilities (Abandonment) means the decision by the Utility to no longer use its facilities and notification of such decision to the Arizona Department of Transportation (ADOT). Abandonment shall not be construed to mean any changes in ownership of the facility.
 - The maintenance of abandoned Utility facilities within ADOT right-of-way shall be governed by laws, guidelines, and regulations adopted by regulatory agencies.
 - The Utility facility owner shall continue to own, map, locate and mark its abandoned facilities in accordance with the requirements of Arizona Revised Statutes A.R.S Sections 40-360.21 through 40-360.32 and by standards adopted by industry organizations.
 - Nothing contained in this guideline shall alter the legal responsibility for compliance with laws regulating construction and installation of Utility facilities within ADOT right-of-way and adherence to environmental laws or regulations.
 - The State assumes no liability for conflicts with utility facilities which are allowed to be abandoned within its right-of-way unless prior rights exist.
 - The Utility facility owner and ADOT shall coordinate for designing installations of new facilities in a manner that minimizes the need to abandon the facility in the future.
 - ADOT will allow underground facilities operators to abandon facilities within its right of way provided that the abandoned facility maintains a separation distance of a minimum of five feet horizontal and two feet vertical between the abandoned facility and any new or proposed highway feature or as defined under the definition of the zone of disruption. Underground facility operators shall remove conflicting portions of their abandoned facilities not maintaining a separation distance of at least five feet horizontal and two feet vertical for projects in the State Transportation Implementation Plan (STIP) or immediate or planned maintenance needs. For the purpose of this guideline, “highway feature” means: ADOT owned and maintained structures. For the purpose of this guideline, “zone of disruption” means: only those areas to be excavated to install highway features.

- Upon planned abandonment of underground facilities, the utility shall provide notice to ADOT. Upon notification, ADOT will amend the existing permit to show the underground facilities as abandoned and send a copy of the amended permit to the utility operator. If there is no existing permit, ADOT will issue a permit to show the underground facilities as abandoned and send a copy of the permit to the utility operator.
- The Utility shall provide, upon ADOT request, as-built records for the location of facilities that are approved for abandonment.
- The Utility shall purge and cap or plug the ends of all facilities approved for abandonment and shall provide warning markers or any other warning devices as required by the appropriate regulatory agency. Slurry filling of the facility may be required. The means of terminating facilities not covered by a regulatory agency shall be coordinated with ADOT. 94 5.2.6.
- The Utility shall be responsible for all of the costs associated with the maintenance or removal of its abandoned facilities within highway right-of-way.”
- **California DOT Utility Permits Chapter 602.3:** “Permittees must remove their facilities at their expense from the highway right-of-way when they are no longer in use. Underground facilities may be allowed to remain in place when the highway segment is also being abandoned.
 - Exception requests may be approved at the discretion of the District Permit Engineer if the facilities or the work involved to remove them:
 - Create a hazard
 - Seriously disrupt traffic
 - Have the potential to damage adjacent facilities.
 - Exception requests must include the proper justification and supporting documents such as alternatives explored etc.
 - Facilities made of or containing hazardous materials (such as asbestos) must be removed in accordance with the “Hazardous Materials and Hazardous Waste Management Special Provisions” (TR-0408).
 - Filling abandoned pipes with sand, two-sack slurry cement, or Controlled Low Strength Material (see Appendix H) is required to protect the highway

- **Connecticut DOT Policies and Procedures:** “In the event the public service company/municipality desires to abandon in place contaminated facilities not in conflict with the State project, the following shall apply:
 - The public service company/municipality must request permission in writing from the State and any other regulatory agency having jurisdiction to abandon in place the contaminated facility not in conflict with the State project.
 - In the event, the public service company/municipality is granted permission in writing by the State to abandon in place a contaminated facility, the public service company/municipality will retain ownership of the facility. The public service company/municipality shall be responsible for all costs associated with releases from facilities that are abandoned in place.”

- **Hawaii DOT:** “In the past HDOT allowed abandonment of underground facilities in the ROW, but ran into many problems, including the need to clean-up after the fuel/oil companies because of leaks in old fuel oil lines that supposedly had been cleaned, plugged & abandoned. HDOT currently has a "NO ABANDONMENT" Policy where we require removal of any facility that is requested to be abandoned. Our Director may grant a waiver to the policy, but in doing so the applicant must enter an agreement that covers future liabilities & obligations. Since the policy took effect in 2002, the Director has not allowed abandonment of any facility that contained hazardous materials.” – Mike Amuro, Hawaii DOT, 2007

- **Michigan DOT Utility Accommodation Policy VII Discontinued Use of Facilities:**
 - Underground Facilities - When a utility discontinues use of an underground facility and the facility remains in the state highway ROW, the utility shall retain a record of the out-of-service facility. MDOT may require out-of-service facilities to be completely removed, partially removed, capped, or filled. All removal costs are the responsibility of the utility.”

- **Minnesota DOT MnDOT Policy OP002:** “If a utility owner discontinues use of an underground facility but desires to leave it in place on the right of way, the utility owner must receive written approval to do so from MnDOT, and a record shall be kept in the utility owner’s permanent files so that the facility can be accurately located in the field. The utility owner shall locate discontinued underground facilities in the same manner as an active facility. MnDOT may at its discretion require abandoned and out-of-service pipes and appurtenant facilities (e.g., manholes, pull boxes, etc.) to be filled in or removed by the utility owner at the time of removal from service or at any time thereafter. All necessary removal and related costs shall be the responsibility of the utility owner.”

- **New York DOT Part 131.13 Abandoned Facilities:** “The utility shall remain responsible for all abandoned utility facilities. The Department on reasonable notice may require the removal of abandoned utility facilities and restoration of the right-of-way, when necessary to avoid interference with the operation, maintenance or reconstruction of the highway. If the utility shall fail to remove the abandoned facility within a reasonable time after such notice, the Department may cause the removal of the facility. Any expenses incurred by the Department arising from abandoned utility facilities shall be reimbursed by the utility or its successor.”

- **Washington DOT Utilities Manual Section 130.06:** “Deactivated, or Disconnected Utilities. Discovery of abandoned, deactivated, or disconnected utilities often results in project delays during highway improvement projects or maintenance activities. There is also a safety issue when locating underground utilities near other active utility lines. Whenever possible, the first goal should be to completely remove any utility facility no longer required by the utility owner, at the owner’s expense.
 - When utility removal is infeasible (which it often is), take appropriate steps to document and secure the abandoned, deactivated, or disconnected utilities’ status and ownership. Maintain an accommodation document on file to document the location, ownership, and status of abandoned, deactivated, or disconnected in-place utilities. Refer to Pipelines for guidance on abandoning pipes and casings.

 - Certain utilities that are abandoned, deactivated, or disconnected but are not removed, such as pipes or casings, may offer opportunities for future utility installations without the need to install additional ducting or casings. Consideration should be given to the safety of the public, the condition of the existing utility, compliance with current standards, and other issues that may be evident.

 - If feasible, completely remove direct buried utility company facilities such as telecommunication lines, unless the facility lies under an existing roadway. If the department has a need for such facilities and would benefit from acquiring ownership of such, then there may be a purpose for keeping the facilities in place.

 - Removal of Hazardous Materials. Utility facilities that may have transported hazardous materials, or any utilities composed of hazardous materials, must be completely removed at the owner’s expense at the time of abandonment. Removal may also be delayed until some future time, as approved by the department. Avoid placing the department in a position where it may need to pay for the future cost of removal and disposal of hazardous materials or contaminants.

- Utilities that wish to abandon, deactivate, or disconnect utilities in place and avoid removal costs may do so, but only under specific circumstances. Facilities that are abandoned, deactivated, or disconnected in place remain the property and responsibility of the utility owner, unless the owner wishes to transfer ownership to the department and the department agrees.
- Utilities that wish to keep ownership of deactivated or disconnected facilities that have been left within the operating highway right of way, must maintain an accommodation document listing the facility as deactivated or disconnected.
- Until abandoned utilities are either removed or ownership is transferred to another organization, the utility facility remains the responsibility of the utility owner of record.
- Utilities that wish to transfer ownership of abandoned facilities to the department may do so, provided the department agrees to the transfer.
 - Requirements for such transfers are:
 - The department must have a clear and present need for using the utility.
 - The utility agrees to release all future claims to the facilities.
 - The transfer must be at no cost to the department, as the transfer is for the convenience of the utility.
- Ownership of abandoned, deactivated, or disconnected utilities should be documented using a new and/or existing utility accommodation document. A file should be maintained in the region and described under Accommodation Documents, Administration and Management. A database record should also be maintained listing the utility as “Inactive.”