

CHAPTER 10

Conclusions

10.1 STUDY PROCESS OVERVIEW

This section provides a brief summary of information contained in Chapter 1, "Common Ground Study Background and Process."

10.1.1 Common Ground Study Objective

The purpose of the Common Ground Damage Prevention Best Practices Study was to identify and validate existing best practices performed in connection with underground facilities damage prevention. The Study focused on gathering and assessing information to determine which existing one-call notification system practices were most effective in protecting the public, excavators, and the environment, and preventing disruptions to public services and underground facilities. All findings contained in this Study are intended for use by state agencies, one-call center operators, underground facility owners/operators, contractor organizations, and other stakeholders who are impacted by or have an impact upon underground facilities. The practices should be further examined and evaluated for incorporation into the development of or improvement to underground facilities damage prevention programs.

10.1.2 TEA 21 Authorization

This Report, *Common Ground: Study of One-Call Systems and Damage Prevention Best Practices*, was prepared in accordance with, and at the direction and authorization of, the Transportation Equity Act for the 21st Century (TEA 21), Public Law 105-178, that was signed into law on June 9, 1998.

10.1.3 Study Team Process

Over 160 Team members participated in the One-Call Systems Study, conducted from August of 1998 through June of 1999.

The Study process consisted of nine Task Teams focused on the various attributes of one-call systems and damage prevention processes. A Linking Team provided overview of the Task Team progress and assisted with the direction of issues that impacted more than one area. A Steering Team provided executive guidance for the Study process. To the extent possible, each Team was a diverse group of stakeholders involved in underground facility damage prevention.

10.1.4 Consensus Process

Each Task Team identified, collected, and evaluated numerous existing practices associated with one-call systems and damage prevention processes, with the intent of identifying the best of these within the

designated areas of focus. Using evaluation criteria developed by the Task Teams, best practices were identified through a process requiring consensus of all participating Team members.

10.2 STUDY FINDINGS

10.2.1 Common Ground Study Best Practices

A great number of sometimes differing or possibly conflicting damage prevention practices currently exist. Practices may differ due to geographical elements, weather patterns, areas of population, or specific types of underground facilities. It is through these differences, however, where the greatest opportunity to share information and learn from one another exists. Through the examination of these existing practices, the Task Teams identified and then selected the set of best practices for underground facilities damage prevention.

Chapters 2 through 9 of this Report contain the best practices identified by the Task Teams. The best practices are organized within the following Task Team focus areas: Planning and Design, One-Call Center, Mapping, Locating and Marking, Excavation, Reporting and Evaluation, Compliance, and Public Education and Awareness.

The Emerging Technologies Task Team was formed to investigate recently developed or promising technologies that will be beneficial in preventing underground facility damage. Although these could not be categorized as best practices, they are in keeping with the overall objective of this Study.

These best practices can now be shared among stakeholders involved with and dependent upon the safe and reliable operation, maintenance, construction, and protection of underground facilities. Moreover, these best practices contain validated experiences that can be further examined and evaluated, and which stakeholders should consider for incorporation into their own underground facilities damage prevention programs.

10.2.2 Measuring Performance Improvement

Measuring the long-term performance of the best practices is essential to assessing which practices are the most effective in damage prevention. Performance measurement is addressed in Chapter 9, “Reporting and Evaluation Task Team Best Practices.”

10.2.3 Partnership

Among the lessons learned from this Study was the intangible value found in bringing together the various stakeholders involved in underground facilities damage prevention, and in having this group focus on solving common problems. In recent years, RSPA has successfully brought diverse stakeholders together to address different issues. For problem solving approaches to risk management, mapping, and most recently underground facility damage prevention, the Quality Action Team model has been an effective process for involving appropriate subject matter experts and stakeholders, data gathering, determining options and

collecting and addressing issues. Although the Common Ground Study Team was comprised of many more areas of interest and participants than in past quality teams, the concepts were similar. This effort has proven successful in terms of establishing and improving channels of communication among many stakeholders that historically have sometimes been more adversarial in their relationships. The Study participants shared a great deal of information with one another and realized significant benefits in working together in search of Common Ground. During the past year, various industry-sponsored conferences have further benefited from this new level of interaction among the damage prevention stakeholders.

The success of the increased levels of communication should be recognized not only for the purposes of this Study, but for future relationships among participating interests. New relationships have been forged during the development of this Study and should continue to grow. Shared responsibility among all stakeholders is a main theme found in this Study in preventing damages to underground facilities. The tremendous amount of communication that made consensus agreement possible among the participants in this Study must be recognized as a fundamental element of effective damage prevention. The successful interaction achieved between facility owners/operators, one-call centers, excavators, designers, contractor associations, and government agencies should be encouraged to carry forward. This will undoubtedly result in improvements in underground facility damage prevention.

10.2.4 Keys to Damage Prevention

The single most critical component of underground facility damage prevention is communication between all stakeholders. Although communication improvement is often cited as the solution to nearly every opportunity, it is nonetheless especially identified as a critical factor to successful application of the Common Ground Study findings. Underground facility damage prevention has a long list of stakeholders who are mutually dependent upon the successful execution of one another's roles in the overall process. The exchange of accurate and timely information during the damage prevention process, coupled with a genuine interest by all stakeholders for a successful outcome, is critical.

Communication is fundamental in the following basic premises of damage prevention:

- 1 Facility owners/operators are members of one-call centers, and
- 2 Excavators call before they dig.

Key elements for the prevention of excavation damage to underground facilities include:

- Facility owners/operators are members of one-call centers in the areas in which they have underground facilities (this includes active, out of service, and abandoned facilities).
- One-call centers maintain accurate mapping data files that reflect which facility owners/operators have underground facilities in the area of the proposed excavation.
- A notice of intent to excavate in an identified area in advance of an excavation is always made to the appropriate one-call center.

- One-call centers analyze excavation notices to identify members with facilities in the excavation area.
- One-call centers notify any potentially affected facility owners/operators.
- Underground facilities are accurately located and marked prior to excavation.
- Excavators exercise proper and safe excavation practices.

The benefits of following the **Dig Safely** approach to excavation activities cannot be underestimated. It is always best to “Call Before You Dig.” Utilizing the one-call system is the best and most viable method to minimize the significant risks that can be involved in excavation activities.

10.3 REMAINING ONE-CALL SYSTEM OPPORTUNITIES AND ISSUES

Significant background information, knowledge sharing, idea generation, and a shared responsibility for awareness of existing opportunities and one-call system issues were gained as a result of the Common Ground Study. Some of those identified issues could not be solved through the examination and evaluation of best practices. Although considered to be outside the scope of this Study, the Linking Team felt it would be remiss to not raise the awareness of the various stakeholders to those issues and opportunities, and has consequently elected to summarize some of the more significant ones that were discussed.

The following issues currently impact or cause ongoing concern to underground facility damage prevention efforts and may result in injuries, fatalities, environmental insult, and loss of vital services.

- **Peak Workload** – Current trends in notifications of intent to excavate have resulted in peak workload issues that primarily affect the one-call centers and facility locating and marking personnel. The typical workweek for pre-planned excavation occurs from Monday through Friday. This results in excavation notifications often being received in high numbers to allow for the start of excavation on Monday of the following week. Staffing for peak workloads causes problems for one-call centers and facility locators, with a typical compromise being to staff for the slower periods and to work overtime during the peak times. Temporary workers often don’t meet the necessary requirements, as both activities require significant training and on the job experience. The concern with this situation is that the resulting peak workload may cause rushed or hurried work, which increases the likelihood of human error and consequential facility damage.
- **Seasonal Workload** – Similar to “Peak Workload”, excavation patterns typically follow weather patterns, with most work being scheduled to avoid frozen ground, crop damage, poor weather seasons, or other general periods of low construction efficiency. The burden again affects the one-call centers and the facility locators, who must handle the periods of high excavation activity and still be able to maintain financial profitability during the slower times.

- **Unlocatable Facilities** – Critical to the damage prevention process is the ability to accurately locate, mark, and identify the precise position and depth of underground facilities. Current technology limits and underground facility materials sometimes make this difficult or even impossible to determine.
- **Abandoned or Unregistered Facilities** – When facility owners/operators are not identified, or when the one-call centers do not have location information for abandoned facilities, locating personnel are disadvantaged in that they are unlikely to be looking for facilities that they are unaware of. Abandoned facilities are not necessarily safe facilities, and at a minimum they can cause significant delays and increased excavation costs when encountered. Abandoned or unregistered facilities that are damaged can cause environmental consequences, safety risks to excavation personnel, unanticipated repair costs, and possible disruption to vital services.
- **Inaccurate Facility Owner/Operator Records** – Inaccurate or out of date facility owner/operator records negatively impact the ability to locate underground facilities. Differing practices among facility owners/operators and other industries in areas of as-built drawings, mapping practices, and details of original construction configurations, when coupled with asset transfers and changes to facilities, over time present ongoing challenges in damage prevention.
- **Emergency Excavation** – When circumstances require emergency excavation, the one-call system and facility locating processes are sometimes bypassed, placing excavators and emergency personnel at risk.
- **Urban Sprawl** – Many underground facilities were installed years ago in rural or low population areas. Although these facilities were suitably installed and adequate for the original construction conditions, they are sometimes not ideal for the new conditions resulting from higher population and increased surface activity. If these same facilities were rebuilt today, there could likely be modifications in design depths, routing, mapping, or marking and identification practices to more ideally coexist with today's higher populations and land usage. Protecting these existing facilities presents new challenges.
- **Human Error** – The entire one-call system damage prevention process is heavily dependent upon accurate handling and communication of excavation information. Human errors at any step in the process in reporting and receiving, analyzing, and responding to information related to excavation activities can possibly result in facility damage.
- **Conflicting and Inconsistent Laws and Practices** – Each state has its own laws and practices governing excavation and damage prevention. Although similar in intent, the specific requirements vary from the slight to the extreme, with even some direct conflicts in laws and practices from an individual state to its adjoining neighbors. For facility owners/operators, locators, and excavators operating in multiple states, these variations can cause confusion and inefficiencies in safely performing excavation activities.

- State Allowed Exemptions – Some states allow one-call system exemptions to specific interest groups. These exemptions may have resulted in, or contributed to, damages of underground facilities.
- Weak Enforcement of Damage Prevention Laws – Some damage prevention efforts are limited by effectively having no teeth in damage prevention laws. This can result in inconsistent one-call system practices and the possibility of higher damage rates. State practices also vary greatly regarding which groups are responsible for the actual administration and issuance of damage prevention enforcement, with wide degrees of variation in program utilization and overall impact.
- Continuing Education – New stakeholders regularly become involved with some aspect of underground facilities. The burden of educating new stakeholders, as well as providing refresher training to others, is sometimes not consistently and effectively performed. The communication requirements are significant, yet in practice may be lacking in some areas, as central coordination of a damage prevention communication plan does not exist.
- Excavation without Calling – There continues to be some excavation activity commencing without the appropriate one-call notification being made. Some damages to facilities occur as a result of calls not being made.
- Small Facility Owners/Operators – Some small facility owners/operators are not currently members of one-call centers due to the financial costs involved (i.e., ticket costs and in-house labor costs associated with locating and marking their facilities). While understanding the financial impact of these non-participating facility owners/operators, a safety and economic burden is placed on the remaining stakeholders when these facilities are encountered.

The following subjects were not addressed by the Study Team as they were not considered to be within the One-Call Systems Best Practices Study scope. Although not evaluated, these general subjects have the potential to significantly impact the safe and reliable operation of underground facilities:

- Vandalism,
- Acts of Terrorism,
- Acts of Nature resulting in movement of land and facilities, and
- General facility maintenance and operation

10.4 PATH FORWARD

The best practices contained in this Report should be considered by all stakeholders involved in or affected by underground facility damage prevention laws and practices. Each state needs to evaluate these best practices, taking into consideration risks to public safety, environment, excavators and vital public services. Damage prevention laws should be upheld, and compliance by stakeholders should be encouraged and enforced as appropriate to ensure adherence.

As recommended by the Reporting and Evaluation Task Team, damage prevention performance records should be standardized and analyzed for directional improvement. Based upon data analysis, further opportunities for damage prevention improvement may be identified in the future. Analysis of consistently collected and analyzed data will help focus future targeted areas of damage prevention performance.

Today's best practice often originated as yesterday's educated guess or considered attempt to further enhance damage prevention results. Similarly, further advances and research for tomorrow's best practices should be continually encouraged. Damage prevention is not a stagnant field, and it is important to maintain an environment that allows for and promotes the search for even "better practices." Technological advancements, such as those identified in Appendix A, "Emerging Technologies," will hopefully lead to improved methods for denoting, locating, identifying, and marking underground facilities, which should lead to even greater reductions in underground facility damage and improved facility protection.

The items described in Section 10.3, were not resolved through the development of this Report. Over time, analysis of data, as recommended by the Reporting and Evaluation Task Team best practices in Chapter 9, will help to identify which of these are having the highest impact on underground facility damage prevention. Based upon the data analysis, the Study Team recommends that further review and consideration be performed on these items to determine whether new practices are warranted.

Finally, the Study Team recommends the continued future application of the RSPA "Quality Action Team" model. The process model has been successful in bringing together diverse stakeholders for purposes of effectively and efficiently collecting information, analyzing data, and making path forward recommendations. The Common Ground Study results further demonstrate the unmatched value of pursuing initiatives through a joint industry, stakeholder, and regulatory agency Quality Action Team model.