Safety & Damage Prevention

...Putting it all together

Stakeholder Advocacy

Nine Elements Of An Effective State Damage Prevention Program

As described in the Pipeline Inspection, Protection, Enforcement and Safety (PIPES) Act of 2006

CGA BEST PRACTICES

ELEMENT 1

Participation by operators, excavators, and other stakeholders in the development and implementation of methods for establishing and maintaining effective communications between stakeholders from receipt of an excavation notification until successful completion of the excavation, as appropriate.

2–8: Mandatory Prebid Conferences
Practice Statement: A mandatory prebid conference is held and bids are accepted only from attending contractors.

2–9: Continuous Interface between the Designer and Potential Contractors during the Pre-bid/Bid Phase
Practice Statement: Once a project design is completed, the designer participates in the pre-bid/bid process.

2–4: Utility Coordination
Practice Statement: Project owners and facility owners/operators regularly communicate and coordinate with each other concerning future and current projects.

2–10: Continuous Interface between the Designer and the Contractor during the Construction Phase
Practice Statement: The designer continues to interface with the selected contractor throughout the construction phase.

2–14: Subsurface Utility Engineering (SUE)
Practice Statement: When applied properly during the design phase, Subsurface Utility Engineering (SUE) provides significant cost and damage-avoidance benefits and the opportunity to correct inaccuracies in existing facility records.

2–16: Project Coordination
Practice Statement: Large and/or complex projects may require the use of specific processes established to enhance safety and to coordinate buried-facility damage-prevention efforts among all potentially affected stakeholders throughout the life of the project. Such processes are intended to compliment, and be used in addition to, standard and customary one call notification and locating practices.

3–4: One Call Center Governance
Practice Statement: The one call center is governed by a board of directors representing the diverse makeup of the constituent groups (for example facility owners/operators, designers, contractors/excavators, and government).

3–12: Documented Owner Verification of Data Submitted by Facility Owners/Operators
Practice Statement: The one call center returns the geographic description database documentation to the facility owner/operator annually and after each change for verification and approval.

3–14: Meeting between the Excavator and Facility Operator(s) Initiated by One Call Notification
Practice Statement: The one call center has a process for receiving and transmitting requests for meetings between the excavator and the facility operator(s) for the purpose of discussing locating facilities on large or complex jobs.

4–9: Positive Response to Locate Request
Practice Statement: Positive response is provided to facility locate requests.

4–11: Abandoned Facilities
Practice Statement: Information on abandoned facilities is provided when possible.

4–14: Communication between Parties
Practice Statement: Communication is established between all parties.

5–1: One Call Facility Locate Request
Practice Statement: The excavator requests the location of underground facilities at each site by notifying the facility owner/operator through the one call center. Unless otherwise specified in state/provincial law, the excavator calls the one call center at least two working days and no more than ten working days prior to beginning excavation.

5–2: White Lining
Practice Statement: When the excavation site cannot be clearly and adequately identified on the locate ticket, the excavator designates the route and/or area to be excavated using white premarking prior to the arrival of the locator.

5–3: Locate Reference Number
Practice Statement: The excavator receives and maintains a reference number from the one call center that verifies that the locate was requested.

5–4: Pre-excavation Meeting
Practice Statement: When practical, the excavator requests a meeting with the facility locator at the job site prior to marking the facility locations. Such pre-job meetings are important for major, or unusual, excavations.

5–5: Facility Relocations
Practice Statement: The excavator coordinates work that requires temporary or permanent interruption of a facility owner/operator's service with the affected facility owner/operator in all cases.

5–4: Pre-excavation Meeting
Practice Statement: When practical, the excavator requests a meeting with the facility locator at the job site prior to marking the facility locations. Such pre-job meetings are important for major, or unusual, excavations.

5–5: Facility Relocations
Practice Statement: The excavator coordinates work that requires temporary or permanent interruption of a facility owner/operator's service with the affected facility owner/operator in all cases.

5–8: Positive Response
Practice Statement: The underground facility owner/operator either 1) identifies for the excavator the facility's tolerance zone at the work site by marking, flagging, or other acceptable methods; or 2) notifies the excavator that no conflict situation exists. This takes place after the one call center notifies the underground facility owner/operator of the planned excavation and within the time specified by state/provincial law.

5–12: Work Site Review with Company Personnel
Practice Statement: Prior to starting work, the excavator reviews the location of underground facilities with site personnel.

5–21: Mismarked Facilities
Practice Statement: The excavator notifies the facility owner/ operator directly or through the one call center if an underground facility is not found where one has been marked or if an unmarked underground facility is found. Following this notification, the excavator may continue work if the excavation can be performed without damaging the facility, unless specified otherwise in state/provincial law.

5–23: Locate Request Updates

Practice Statement: The excavator calls the one call center to refresh the ticket when excavation continues past the life of the ticket (sometimes, but not always, defined by state/provincial law). This recognizes that it is a best practice to define ticket life. If not currently defined in state/provincial law, ticket life is ideally 10 working days but does not exceed 20 working days. Original locate request tickets are generated so that the minimum number of locate request updates are necessary for the duration of a project. After all the excavation covered by a locate request is completed, no additional locate request updates are generated. Communication between excavation project planners, field personnel, and clerical personnel is essential in accomplishing this task.

5–24: Facility Damage Notification

Practice Statement: An excavator discovering or causing damage to underground facilities notifies the facility owner/operator and the one call center. All breaks, leaks, nicks, dents, gouges, grooves, or other damages to facility lines, conduits, coatings, or cathodic protection are reported.

5–25: Notification of Emergency Personnel

Practice Statement: If the damage results in the escape of any flammable, toxic, or corrosive gas or liquid or endangers life, health, or property, the excavator responsible immediately notifies 911 and the facility owner/operator.25/ The excavator takes reasonable measures to protect everyone in immediate danger, the general public, property, and the environment until the facility owner/operator or emergency responders arrive and complete their assessment.

5–26: Emergency Excavation

Practice Statement: In the case of an emergency excavation, maintenance or repairs may be made immediately, provided that the excavator notifies the one call center and facility owner/operator as soon as reasonably possible. This includes situations that involve danger to life, health, or property or that require immediate correction in order to continue the operation of or ensure the continuity of public utility service or public transportation.

5–28: As-built Documentation

Practice Statement: Contractors installing underground facilities notify the facility owner/operator if the actual placement is different from expected placement.

5–30: Emergency Coordination with Adjacent Facilities

Practice Statement: Emergency response planning includes coordination with emergency responders and other aboveground and/or underground infrastructure facility owner/operators identified by the Incident Commander through the Incident Command System/Unified Command (ICS/UC) during an emergency.

9–1: All Stakeholders Report Information

Practice Statement: Facility owners/operators, locators, excavators, or stakeholders with an interest in underground damage prevention report qualified information on incidents that could have, or did, lead to a damaged underground facility.

9–2: Standardized Information Is Reported

Practice Statement: The requested data is standardized and consists of minimum essential information that can be analyzed to determine what events could, or did, lead to a damaged facility. This means that collected data includes damage information, downtime, and near-misses.

9–3: Identify the Noncompliant Stakeholder

Practice Statement: It is important to identify the noncompliant stakeholder (facility owner/operator, excavator, locator, or one call notification center) so that this group can be targeted with education and training. It may not be necessary to pinpoint the names and addresses of the offenders for the purpose of improving the damage prevention program.

9–4: Person Reporting Provides Detailed Information

Practice Statement: If all of the requested data is not available, the person reporting the information provides the most complete information possible.

ELEMENT 2

A process for fostering and ensuring the support and partnership of stakeholders, including excavators, operators, locators, designers, and local government in all phases of the program.

3–3: Formal Agreements with Members

Practice Statement: Each member of the one call center abides by state/provincial statute where applicable or written agreement that states the rights and the responsibilities of the one call members and the one call center.

3–4: One Call Center Governance

Practice Statement: The one call center is governed by a board of directors representing the diverse makeup of the constituent groups (for example facility owners/operators, designers, contractors/excavators, and government).

5–4: Pre-excavation Meeting

Practice Statement: When practical, the excavator requests a meeting with the facility locator at the job site prior to marking the facility locations. Such pre-job meetings are important for major, or unusual, excavations.

5–5: Facility Relocations

Practice Statement: The excavator coordinates work that requires temporary or permanent interruption of a facility owner/operator's service with the affected facility owner/operator in all cases.

5–12: Work Site Review with Company Personnel

Practice Statement: Prior to starting work, the excavator reviews the location of underground facilities with site personnel.

5–18: Excavation Observer

Practice Statement: The excavator has an observer to assist the equipment operator when operating excavation equipment around known underground facilities.

5–23: Locate Request Updates

Practice Statement: The excavator calls the one call center to refresh the ticket when excavation continues past the life of the ticket (sometimes, but not always, defined by state/provincial law). This recognizes that it is a best practice to define ticket life. If not currently defined in state/provincial law, ticket life is ideally 10 working days but does not exceed 20 working days. Original locate request tickets are generated so that the minimum number of locate request updates are necessary for the duration of a project. After all the excavation covered by a locate request is completed, no additional locate request updates are generated. Communication between excavation project planners, field personnel, and clerical personnel is essential in accomplishing this task.

5–30: Emergency Coordination with Adjacent Facilities

Practice Statement: Emergency response planning includes coordination with emergency responders and other aboveground and/or underground infrastructure facility owner/operators identified by the Incident Commander through the Incident Command System/Unified Command (ICS/UC) during an emergency.

9–14: An Organization Evaluates the Data

Practice Statement: A centralized and independent organization, such as a Damage Prevention Committee, is identified to evaluate the completed forms and publish the data.

9–15: The Organization Has Representation from All Stakeholders

Practice Statement: The Damage Prevention Committee, with representation from all interested stakeholders, assists in the evaluation process.

ELEMENT 3

A process for reviewing the adequacy of a pipeline operator's internal performance measures regarding persons performing locating services and quality assurance programs.

4–4: Single Locator

Practice Statement: A single locator is used for multiple facilities.

4–5: Locator Training
Practice Statement: Locators are properly trained. Locator training is documented.

4–6: Safety
Practice Statement: Locates are performed safely.

4–7: Visual Inspection
Practice Statement: A visual inspection is completed during the facility locating process.

4–8: Facility Marking
Practice Statement: Facilities are adequately marked for conditions.

4–9: Positive Response to Locate Request
Practice Statement: Positive response is provided to facility locate requests.

4–10: Marking Multiple Facilities in the Same Trench
Practice Statement: Multiple facilities in the same trench are marked individually and with corridor markers.

4–11: Abandoned Facilities
Practice Statement: Information on abandoned facilities is provided when possible.

4–12: Locating Electromagnetically
Practice Statement A: When locating electromagnetically, active/conductive locating is preferable to passive/inductive locating.

Practice Statement B: When electromagnetic locating is not possible, radar-based technologies can be used.

4–13: Facility Owner/Operator Identification
Practice Statement: The facility owner/operator is identified.

4–14: Communication between Parties
Practice Statement: Communication is established between all parties.

4–15: Documentation of Work Performed
Practice Statement: Documentation of work performed on a locate is maintained.

4–16: Damage Investigation
Practice Statement: A damaged facility is investigated as soon as possible after occurrence of damage.

4–17: Forecasting/Planning for Predictable Workload Fluctuations
Practice Statement: A plan is developed for managing unpredictable fluctuations.

4–18: Quality Assurance
Practice Statement: Underground facility owners/operators have a quality assurance program in place for monitoring the locating and marking of facilities.

4–19: Trenchless Excavation
Practice Statement: All stakeholders adhere to all best practices and the general guidelines stated in the following practice description prior to, during, and after any trenchless excavation (as applicable).

4–20: Locating and Marking in Navigable Waterways
A: Permanent Markers for Underwater Facilities
Practice Statement: Permanent markers are placed as close as practical at the entrance and exit points of facilities located underneath bodies of water where facilities are at risk of being damaged. For natural (and other) gas and hazardous liquids pipelines, these affected bodies of waters are "commercially navigable waterways" that have been defined in 49 CFR 195.450 for hazardous liquids pipelines as "waterways where a substantial likelihood of commercial navigation exists."

B: Temporary Markers for Underwater Facilities
Practice Statement: Temporary markers are placed within the areas of proposed excavations as close as practical over facilities that are submerged in bodies of water where facilities are at risk of being damaged without impeding or creating additional hazards.

4–21: Service Lines

Practice Statement: A service line is marked in response to a locate request to the operator who uses the service line to pursue a business that derives revenue by providing a product or service to an end-use customer via the service line. A service line is marked in response to a locate request to a governmental entity that provides a product or service to an end-use customer via the service line.

4–22: Marking Newly Installed Facilities

Practice Statement: Facility operators ensure that new facilities in areas with continuing excavation activity are marked upon installation to indicate their presence.

ELEMENT 4

Participation by operators, excavators, and other stakeholders in the development and implementation of effective employee training programs to ensure that operators, the one call center, the enforcing agency, and the excavators have partnered to design and implement training for the employees of operators, excavators, and locators.

2–7: Use of Qualified Contractors

Practice Statement: Qualified contractors are used to excavate on and near underground facilities.

2–13: Trenchless Excavation

Practice Statement: All stakeholders adhere to all best practices and the following general guidelines prior to, during, and after any trenchless excavation (as applicable).

3–11: Documented Operating Procedures, Human Resource Policies, and Training Manuals

Practice Statement: The one call center has documented operating procedures, human resource policies, and training manuals.

4–5: Locator Training

Practice Statement: Locators are properly trained. Locator training is documented.

6–7: Training

Practice Statement: Locators are trained in map reading and symbology.

9–8: Training Is Provided

Practice Statement: Training and education on how and when to complete the form are made available.

ELEMENT 5

A process for fostering and ensuring active participation by all stakeholders in public education for damage prevention activities.

6–6: Availability

Practice Statement: The land base is available to the public.

8–1: Marketing Plan

Practice Statement: An effective damage prevention education program includes a comprehensive, strategic marketing/advertising plan.

8–2: Marketing 811—A National One Call Number

Practice Statement: An effective damage prevention education program includes promoting the National One Call Number (811) and awareness campaign by communicating the number and "call before you dig" process to excavators and the general public.

8–3: Target Audiences and Needs

Practice Statement: An effective damage prevention education program includes identification of target audiences and their individual needs.

8–4: Structured Education Programs

Practice Statement: An effective damage prevention education program is structured to accommodate the needs of individual audiences.

8–5: Target Mailings
Practice Statement: An effective damage prevention education program communicates vital damage prevention, safety, and emergency response information to target audiences through periodic mailings.

8–6: Paid Advertising
Practice Statement: An effective damage prevention education program includes paid advertising to increase damage prevention awareness and practices.

8–7: Free Media
Practice Statement: An effective damage prevention education program

8–8: Giveaways
Practice Statement: An effective damage prevention education program uses promotional giveaway items to increase damage prevention awareness.

8–9: Establishing Strategic Relationships
Practice Statement: An effective damage prevention education program establishes strategic relationships.

8–10: Measuring Public Education Success
Practice Statement: An effective damage prevention education program includes structured annual or biennial (every two years) measurement(s) to gauge the success of the overall program.

ELEMENT 6

A process for resolving disputes that defines the State authority's role as a partner and facilitator to resolve issues.

ELEMENT 7

Enforcement of State damage prevention laws and regulations for all aspects of the damage prevention process, including public education, and the use of civil penalties for violations assessable by the appropriate State authority.

2–6: Follow All Applicable Codes, Statutes, and Facility Owner/Operator Standards
Practice Statement: When planning and designing the installation of new or replacement of existing underground facilities, the designer follows all federal, state/provincial, and local guidelines, codes, statutes, and other facility owner/operator standards.

3–3: Formal Agreements with Members
Practice Statement: Each member of the one call center abides by state/provincial statute where applicable or written agreement that states the rights and the responsibilities of the one call members and the one call center.

3–8: Retention of Voice Records According to Applicable Statutes
Practice Statement: Voice records of all calls concerning requests to locate facilities are retained according to applicable statutes.

3–10: Printed Ticket Recall
Practice Statement: The one call center can provide a printed copy of any ticket for a period of time determined by applicable statutes.

4–16: Damage Investigation
Practice Statement: A damaged facility is investigated as soon as possible after occurrence of damage.

5–16: Federal and State Regulations
Practice Statement: The excavator complies with all applicable federal and state/provincial safety regulations, and, when required, provides training as it relates to the protection of underground facilities.

7–1: Public and Enforcement Education
A: Public Education
Practice Statement: Public education programs are used to promote compliance.

B: Enforcement Education
Practice Statement: Mandatory education is considered as an alternative or supplement to penalties for offenders of the damage prevention laws and regulations.

7–2: Incentives

Practice Statement: Damage prevention programs include incentives to promote compliance with laws and regulations.

Incentive—Membership: Membership facilitates communication between an excavator and facility owner/operator, which helps prevent damage to underground facilities.

Incentive—Membership Accommodations: To avoid cost being a barrier to membership, several states have made membership accommodations for smaller municipals and authorities.

Incentive—One Call Center Board of Directors: Boards are composed of representatives of all stakeholders. Representation of all stake holders in the governance of the one call center (although not necessarily in the administration of the one call center) ensures that the viewpoint of all stakeholders will be considered in the policies and programs of the one call center.

Incentive—Safety and Liability Protection: Compliance with one call center requirements promotes worker safety and public safety and reduces exposure to liability.

Incentive—Reasonable Enforcement of Regulations: Reasonable enforcement of regulations refers to actions by enforcement authority officials and enforcement processes, both of which aim to fairly arrive at rational outcomes, such as education and penalties that correspond to the gravity of the violation, without imposing unnecessarily high transaction costs on any participant, including the enforcement authority.

7–3: Penalties

Practice Statement: Compliance programs include penalties for violations of the damage prevention laws or regulations.

A penalty system includes education as an alternative or supplement to civil or other penalties.
A penalty system also establishes mitigating and aggravating factors for determining the penalty for a violation by statute or regulation.

A penalty system does not allow any violator or class of violators to be shielded from the consequences of a violation (i.e., all stakeholders should be accountable).

7–4: Damage Recovery

Practice Statement: State damage prevention laws and regulations recognize the right to recover damages and costs resulting from noncompliance.

A: Right of Recovery

Practice Description: The statute recognizes an injured party's right to recovery when damages and/or costs are incurred as the direct result of an entity's failure to comply with the one call laws and regulations. For example, Arizona endorses an injured party's right to recover damages when the other party has failed to comply with the one call law.

B: Alternative Dispute Resolution

Practice Description: Avenues for settlement of disputes include alternative dispute resolution. Minnesota endorses ADR through the state court system, New Jersey endorses ADR in construction contract documents, and the federal government endorses ADR through the federal courts.

7–5: Enforcement

A: Authority

Practice Statement: An authority is specified through state statutes and given the resources to enforce the law.

B: Structured Review Process

Practices Statement: A structured review process is used to impartially adjudicate alleged violations.

Type 1: Traditional Enforcement Authority

Type 2: Advisory Committee (made up of stakeholders) partnered with State Agency

9–17: Data Is Used to Elevate Underground Damage Awareness
Practice Statement: The reported data is not primarily used to penalize or punish; rather, it is used to elevate underground damage awareness through recommended training and education.

9–19: Root Causes Are Identified
Practice Statement: Root causes of damages or near damages are identified.

ELEMENT 8

A process for fostering and promoting the use, by all appropriate stakeholders, of improving technologies that may enhance communications, underground pipeline locating capability, and gathering and analyzing information about the accuracy and effectiveness of locating programs.

3–6: Hours of Operation
Practice Statement: The one call center can process locate requests 24 hours per day, 7 days per week.

3–7: Voice Record of All Incoming Calls
Practice Statement: A voice recording is maintained of all voice transactions concerning requests to locate facilities.

3–8: Retention of Voice Records According to Applicable Statutes
Practice Statement: Voice records of all calls concerning requests to locate facilities are retained according to applicable statutes.

3–9: Caller Feedback
Practice Statement: The one call center provides the caller with a ticket number and the names of facility owners/operators who will be notified for each locate request.

3–10: Printed Ticket Recall
Practice Statement: The one call center can provide a printed copy of any ticket for a period of time determined by applicable statutes.

3–12: Documented Owner Verification of Data Submitted by Facility Owners/Operators
Practice Statement: The one call center returns the geographic description database documentation to the facility owner/operator annually and after each change for verification and approval.

3–13: Flexibility for Growth and Change
Practice Statement: The one call center's operating plan is sufficiently flexible to accommodate growth and change.

3–14: Meeting between the Excavator and Facility Operator(s) Initiated by One Call Notification
Practice Statement: The one call center has a process for receiving and transmitting requests for meetings between the excavator and the facility operator(s) for the purpose of discussing locating facilities on large or complex jobs.

3–16: Locate Request
Practice Statement: The one call center captures the following information, at a minimum, on a locate request:

- Caller's name and phone number
- Excavator's/company's name, address, and phone numbers
- Specific location of the excavation
- Start date and time of the excavation
- Description of the excavation activity

3–18: Disaster Recovery
Practice Statement: A one call center develops, implements, and maintains an effective disaster recovery plan that enables the one call function to continue in the event of a disaster.

3–19: Direct Electronic Locate
Practice Statement: The one call center provides users a means of direct, electronic entry of locate requests that maintain comparable ticket quality to an operator-assisted entry.

3–20: Accept Multiple Reference Points for Locate Requests
Practice Statement: The one call center can accept multiple types of points of reference to define the exact location of an excavation site (e.g., latitude/longitude, highway/railroad/pipeline mile markers, address, street/cross street, etc.).

3–21: One Call Center Security
Practice Statement: The one call center provides appropriate physical and systems security, fire protection, and electrical protection to protect the one call center and its critical components.

3–22: Hardware Designed to Tolerate a Single Point of Failure
Practice Statement: The one call center uses fault-tolerant hardware for its critical path operations, such as ticket taking, database access, and ticket delivery.

3–24: Web Services Solution
Practice Statement: The one call center provides a method by which a member operator can receive excavation notifications through a secure Web service that uses an accepted standard for its ticket format, such as Extensible Markup Language (XML) 1.0.

4–12: Locating Electromagnetically
Practice Statement A: When locating electromagnetically, active/conductive locating is preferable to passive/inductive locating.

Practice Statement B: When electromagnetic locating is not possible, radar-based technologies can be used.

6–1: Land Base Accuracy
Practice Statement: The land base is accurate.

6–2: Latitude/Longitude
Practice Statement: The land base and database use latitude/longitude (Lat/Long) coordinates.

6–3: Up-to-date Land Base Information
Practice Statement: The land base is up-to-date.

6–4: Timely Database Updating
Practice Statement: The database is updated by information from facility owners/operators.

6–5: Electronic Mapping Location Area
Practice Statement: The electronic mapping system can produce a ticket for the smallest practical geographical area.

6–6: Availability
Practice Statement: The land base is available to the public.

Viewpoint: Locator

Locators use maps to help find the excavation site and to help determine the general location of the buried facility.

6–7: Training
Practice Statement: Locators are trained in map reading and symbology.

6–8: Discrepancies
Practice Statement: The locator provides precise facility location to the facility owner/operator when there is a discrepancy.

6–9: Feedback
Practice Statement: The locator supplies feedback to the one call center.

Viewpoint: Excavator

6–10: Accuracy of Location Information
Practice Statement: The excavator provides accurate location information to the one call center.

6–11: Excavation Area Details
Practice Statement: The excavator provides to the one call center basic attributes about the excavation area.

Viewpoint: Facility Owner/Operator

6–12: Mapping Data
Practice Statement: The facility owner/operator provides mapping data to the one call center.

6–13: Access to Mapping Data
Practice Statement: The facility owner/operator provides mapping data access.

6–14: Mapping Standards
Practice Statement: The facility owner/operator adheres to mapping standards.

6–15: Quality of Information
Practice Statement: The facility owner/operator provides consistent, current information to the one call center.

6–16: Information Capture
Practice Statement: The facility owner/operator collects detailed mapping information.

Viewpoint: Project Owner

6–17: Accuracy of Location Information
Practice Statement: The project owner provides accurate information.

6–18: Excavation Area Details
Practice Statement: The project owner determines the excavation area's basic coordinates.

Mapping: Emerging Technologies
Technology is rapidly changing. Many of the best practices identified in this chapter could be obsolete in the near future. Although the following technologies are now used in other applications, their use is not widespread in the damage prevention field:

- Geographic Information System (GIS)
- Global Positioning System (GPS)
- Orthographic and satellite imagery

GIS allows the integration of digital maps with other databases to view the relationship of physical features; conducts relational queries; and obtains additional information on a particular feature. The GIS infrastructure or base will support all of the advanced technologies of GPS, orthographic. and satellite imagery. Combining orthographic and satellite imagery with an overlay of a line map, street names, addresses, and GPS coordinates of utility lines will allow one call centers, excavators, locators, facility owners/operators, and project owners to view the accurate and relative location of utility lines. Advanced use of these technologies in combination with advances to locating technologies is expected to reduce damage to underground facilities.

ELEMENT 9

A process for review and analysis of the effectiveness of each program element, to include a means for implementing improvements identified by such program reviews.

3–23: One Call Quality Standards
Practice Statement: The one call center establishes and monitors performance standards for the operation of the center.

4–18: Quality Assurance
Practice Statement: Underground facility owners/operators have a quality assurance program in place for monitoring the locating and marking of facilities.

9–20: Results Are Quantified Against a Standardized Risk Factor
Practice Statement: Results are quantified against a standardized risk factor. The risk factor considers a stakeholder's exposure to potential damage. This risk factor may be based on factors such as the number of miles of line installed or the number of one call center notification tickets. For example, a risk factor may compare how many underground damages occurred in a certain time period versus the total number of notification tickets issued.

9–21: Performance Levels and Trends Are Assessed
Practice Statement: Performance levels and trends are assessed against those of other organizations.