



ONE MORE SCOOP

One More Scoop is a regular column that examines issues involved in the prevention of damage to underground facilities. Each issue, three industry leaders will give their views on a specific topic. In this issue, our panel includes **Don Heyer**, operations/PR manager for USA North; **Phillip Sher**, independent consultant involved in pipeline incident investigation and underground damage prevention; and **Ron Peterson**, president of S.E.E. Underground Technologies and Consulting.

This month our panel discusses the purpose of a tolerance zone and what is its role in preventing damages.

Now the purpose of the tolerance zone is to provide a key element in damage prevention; for the excavator to expose the subsurface installation with hand tools or other appropriate means (vacuum excavation, with permission from the operator) prior to use of any power operated or power driven equipment. Once the excavator exposes the subsurface installation, they can determine if they have found the correct subsurface installation by the markings on the ground or with as-builts provided by the operator. At this point, it is important to remember it is the excavator's responsibility to take steps to protect the subsurface installation from excavation or any outside source.

types of subsurface installations without any human intervention, we have to rely on what we have today.

So, yes, we still need to use tolerance zones as damage prevention and protection for the excavator and the public. The tolerance zone is one of the last safety nets that still can protect all of us if it is used. Unfortunately, the tolerance zone has been abused, forgotten, or just ignored. I know the use of hand tools or vacuum excavation is one of the last things we want to use. Why? Because they are slower and less efficient than just going hog-wild with power operated or power driven equipment. Yet, if we respect the tolerance zone and actually use hand tools to expose, identify and protect the subsurface installation, damages to these subsurface installations are reduced.

Now, I am not saying that we shouldn't educate and train our locators. We should do this and periodically check their accuracy and retrain them. In addition, we should encourage manufacturers of locating devices to continue to make technological advances with their equipment. However, until all this is completed, we need to still use the tolerance zone as a safety net.

Don's View

What is the purpose of a tolerance zone and what is its role in preventing damages?

There are several names for the tolerance zone, so to

keep everyone on the same page we should include the additional names so there is no misunderstanding. You have:

- buffer zone
- hand dig zone
- approximate location of subsurface installation

While there could be other names, the definition of these terms is generally a strip of land not more than "so many inches" (24" in the states I serve) on either side of the exterior surface of the subsurface installation. I should include that this does not include depth of the subsurface installation.

There are several roles for the tolerance zone. First and foremost, it exists to prevent damage to the subsurface installation. Even more important, it provides for the protection of the excavator, their employees and the general public. Another important role of the tolerance zone is to protect the environment, natural resources and the essential services that the subsurface installation provides.

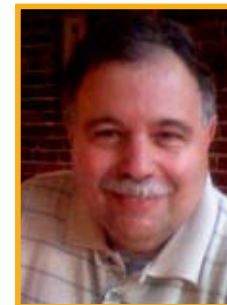
Why do we need the tolerance zone? I believe that I can provide some reasons. Even though we have made many advances with locating technology, accurate locating boils down to several things: the type of device, types of signals, proper understanding of the instrument, types of soils, proper understanding of the theory of locating, willingness of the employers to keep up the training of their employees, and, of course, the individual's ability to pull all these into accurate locating. In previous articles, I have made the statement that locating is more of an art than it is a science. But with the aid of technology, we are rapidly closing the gap. But until the manufacturers can make a locating device that is human-proof and can locate all

Phil's View

What is the purpose of a tolerance zone and what is its role in preventing damages?

Goal:

In discussing any issue involving locating utility facilities, it is important to re-



member the goal of underground damage prevention programs – to protect the public safety.

Two Forms of Tolerance Zone:

A tolerance zone is the corridor around an underground facility designed to protect that facility and where certain additional requirements may apply regarding excavation activity in order to protect the facility and its support from damage and to protect the public from danger.

There are two forms of tolerance zone. One is to allow for the inexactitude of locating facilities, while the other is to provide for the fact that the facility may be larger than a paint mark.

Ideally, underground facilities are identified based on records of the facility owner and underground detection equipment. The perfect utility installation is in exactly the place indicated on the owner's perfect records. The perfect utility locator uses the perfect method and finds the precise location of the facility without any interference from any other buried facilities, geological anomalies or abandoned facilities (including abandoned trolley tracks) and the location coincides with the location derived from the owner's records. The mark-out person marks the facility clearly and in exactly the right location right next to the place where the excavator plans to dig.

Unfortunately, we do not live in a perfect world. Sometimes company records have been lost. Some existing records, particularly of older facilities, may tie to physical facilities that no longer exist (such as 20 feet west of the southwest corner of a building that was torn down years ago; 35 feet north of utility pole #12345, but the pole no longer exists; or in an urban renewal area where whole neighborhoods have been eliminated). Other records may be incomplete, or the measurements taken may not have been completely correct. So, measurements using records may not be sufficient to provide the precise location.

In addition, the excavator may be digging some distance from the actual mark, since the interval between markings could be a considerable distance. This could result in

the excavator having difficulty in correctly identifying the facility in the immediate area of the excavation.

Locating equipment works on certain principles of physics. Facilities that are not electrically isolated may cause signals to travel in unanticipated directions and produce false indications of the facilities. Certain soils and the physical anomalies in the ground, as well as buried facilities (including abandoned trolley tracks), may also distort the signals and interfere with the path of magnetic fields typically used to locate buried facilities. Therefore, locating facilities with exact precision using existing facility location equipment may not be possible.

Therefore, there are legitimate reasons why an owner of underground facilities may not be able to precisely locate their facilities. The tolerance zone, typically 12" on either side of the mark, balances the need of the owner of the facility to have some leeway for possible record issues as well as inexactitude in locating techniques, while avoiding unreasonable demands on the excavator.

The other element of a tolerance zone allows for the fact that the facility may have significant width which must be taken into account. For example, if a 36-inch gas pipe were marked perfectly, it would extend 18 inches beyond the mark out on each side – greater than the typical 12 inch tolerance zone. Therefore, tolerance zones are typically the width of the facility (when noted in the mark out), plus the typical 12-inch tolerance, for a total of 30 inches on each side of the mark for the 36-inch gas line. Further, it is not uncommon for electric and communications ducts to be 3 or even 6 feet wide. Clearly there is a need to address these situations.

If an excavator respects the tolerance zone, they should be able to excavate safely and avoid damage to facility, thereby protecting the public safety and the safety of its employees.

Conclusion:

To adequately provide for the public safety, a tolerance zone is necessary and reasonable and must be respected by the excavator. The size of the tolerance zone is a function of

state and/or local laws and ordinances and is used to establish the local standard of care.



Ron's View

I have two initial thoughts on the purpose of a tolerance zone.

First, it is an area that allows for the challenges of the locate process. We would all like to

live in a world where every mark is perfectly placed over the facility, but unfortunately, this is not our reality. Numerous conditions may exist that can cause inaccuracies in a locate. The tolerance zone helps by providing a "safe zone" or approximate location.

Hopefully, over the last 20 years, we've learned that we must install underground facilities in a proactive manner to insure that they can be located at a later time. Looking forward, we expect equipment improvements will also allow for more accurate locating. Right now, better training helps give the locate technician the tools to identify and troubleshoot when difficulties arise.

My second thought is that the tolerance zone serves as a starting point for the excavation process, not a point along the way to stop and hand dig. By exposing marked facilities prior to mechanical excavation, damage can be prevented. If the facility is not found in the tolerance zone, a call can be made to alert the utility/locator that a problem exists. Otherwise, all lines are exposed and the contractor then can make an informed decision on how to proceed.

This leads to the second part of the question, about the role the tolerance zone has in preventing damage. The tolerance zone itself won't prevent damage without the cooperation of both excavators and locate technicians. If either party fails in their responsibility, damage may occur. Too often, locators and excavators are put in adversarial situations as a result of utility damages. The real key is to work together to prevent them in the first place. **UF**