Operating Experience Summary
Office of Environment, Safety and Health
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VERIZON AND DOE MEET TO SHARE OPERATING EXPERIENCE ON UTILITY DAMAGE PREVENTION

The Department of Energy (DOE) Corporate Operating Experience Program requires that DOE learn from both internal and external operating experience. In the area of external operating experience, it is important that DOE reach out to industries involved in related work activities with similar worker safety concerns and share corrective actions and work practices that have proven effective. One such activity is excavation and trenching, where electrical utilities and natural gas lines are often at risk of being breached.

On March 23, 2006, the Office of Environment, Safety and Health (EH) met with senior managers at Verizon to share operating experience on improvement efforts to prevent inadvertent intrusion of underground utilities.

Verizon Communications, Inc., a leader in wireline and wireless communications, has undertaken a major project to install fiber-optic cables and associated optical electronics to connect millions of customers to their network. In doing so, Verizon, and their subcontractors, must perform millions of trenching and penetration operations during the course of this project. In order to help minimize damage, Verizon established an organization that includes 7 damage prevention local managers and 55 damage prevention/compliance inspectors to provide contractor compliance and oversight, ensure damage prevention, and address customer complaints. In addition, Verizon provides training, conducts routine meetings, and has established requirements for field inspection, reporting, and penalties.

Damage Prevention Training

- All contractors and all Verizon damage prevention management personnel are trained on damage prevention rules and safety.
- All Verizon inspectors are trained on Miss Utility safe digging practices.

Damage Prevention Inspector Field Requirements

- Pull Miss Utility tickets daily and audit utility locates.
- Perform random pre-construction walkthrough audits.
- Visit the assigned contractor twice daily and prepare quality assurance sheets.
- Monitor contract crews throughout the day.
- Issue stop-work orders to any contractor not in compliance with Verizon standards or not following Miss Utility guidance.

Contractor Field Requirements

- Crew foremen must be onsite before any excavation begins.
- Perform a pre-construction walkthrough with a Verizon inspector.
- Use an air knife and high-pressure water technology for potholing.
- Foremen and supervisors must wear marked orange vests for clear identification.
- Maintain manageable supervisor-to-worker ratios.
- Contractor supervisors must perform a quality check at the end of the day to verify 100 percent restoration and complete a compliance checklist.

Damage Reporting Requirements

- Contractor crew foremen are required to notify Verizon, the prime contractor field supervisor, and locating companies if a facility is damaged.
- A Verizon damage inspector conducts an investigation.

Utility Damage Objectives and Penalties

- Establish monthly contractor monetary penalties for exceeding the objective.
- If a contractor exceeds the objective and incurs at-fault damage, work is stopped and damage prevention re-training is required.
- Repeat offenders are removed from the project and bidding process.

On January 24, 2006, an EH representative attended the monthly Maryland/District of Columbia Damage Prevention Meeting at the Miss Utility Call Center. These monthly meetings provide a forum for utility owners, utility locator services, excavator companies, and construction outfits to discuss issues related to safe work performance and damage prevention. An electrical utility representative stressed that Verizon's commitment to training and use of air knives for digging has resulted in a decrease in damages.

DOE has experienced some of the same issues and can learn from Verizon's approach. Applying an effective locator technology in pre-job surveys is critical for preventing inadvertent intrusions into underground utilities. It was also noted during the technical exchange with Verizon that new technology is not always the best technology. New technologies for locating energized conductors or embedded interferences in concrete and energized conductors underground still have limitations that are often not fully appreciated. For example, a manufacturer's new locator equipment has software limitations, particularly when water is present in the soil.

Savannah River Site personnel conducted a survey of currently available technologies to support both drilling or penetrating walls and excavation activities. The results of the survey are displayed on the right. The Extech DVA30 and the Protovale Elcometer P700 are currently being evaluated for application in identifying energized conductors behind walls/in conduit and underground, respectively. EH will monitor the development of future promising technologies in radar tomography and capacitive proximity imaging for applicability throughout the DOE Complex as they enter the marketplace.

DOE anticipates further discussions with Verizon focused on specific locator technologies and their applications.

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Drilling and Penetrating Walls

Technology	Company	Equipment Model
Ground-penetrating radar (GPR)	Geophysical Survey Systems	HandyScan
	NDT James Instruments	Datascan MK II
	Mala Geoscience	CX 11
	SDS	Proformeter 5
Magnetic detection	Hilti	Ferroscan PS20, PS200
	Fisher Labs	M-101, HR-7000
Pulse induction/ eddy current	Protovale	CoverMaster CM9, CM52
X-ray	Russel NDE Systems	6 MeV Portable x-ray Betatron, PPXB-6
Proximity voltage/ current detectors	Extech	DVA30, DA30, DV30
	Triplett	Sniff-It 2
	Amprobe	Model K-1, VP-600S
	ECOM	Volt-Ex 20
	Fluke	VoltAlert 1AC, LVD1
	Gardner Bender	GVD-505A
	Greenlee	GT-11
Contact voltage detector	Fluke	C9970
Magnetic field, optical, and acoustical signals alignment and detection	First Edition Products	DrillSpotter and Metal Detector Combo

Excavations

Technology	Company	Equipment Model
Ground-penetrating radar (GPR)	Geophysical Survey Systems	SIRveyor SIR-20, TerraSIRch SIR-3000
	Vermeer Manufacturing	Interragator EZ, II
	Mala Geoscience	Easy Locator, Ramac X3M
	UTSI Electronics	Groundvue 1
	Sensors and Software, Inc.	Noggin 1000, 500, 250
	PipeHawk PLC	Pipehawk II
	Penetradar	IRIS Version P
	3D-Radar AS	Geoscope 3D GPR
Magnetic locator	Schonstedt Instrument Co.	GA-92XT
Radio frequency locator	Metrotech	9800 XT, 800 Series
	3M	Dynatel
	Fisher Labs.	TW-6, TW-8800
	Amprobe	AT-3000
	Schonstedt Instrument Co.	MAC 51BX
	Pipehorn	800 Series
Live cable locator	Protovale	Elcometer P700
	Amprobe	AT-3000