Avoiding injury from

Tom Phillips looks at the HSE's guidance contained in publication HSG47, and how companies can abide by it in practice



Signal generators can locate services that a CAT will not find, including lamp post supplies, street signs or power cables that are not under load

INCREASING scrutiny from health and safety regulators, and the stringent application of construction design and management regulations, has led to a refocusing of safety within the drilling and geotechnical industry. Over the past five years there has, quite correctly, been significant focus on the safety of drill rig guarding, but many professionals are concerned that the industry has taken its eye off the ball in respect of the greatest hazard faced on site.

Figures provided by the UK Health and Safety Executive (HSE) record 11 major injuries in the construction sector caused by contact with underground, electrical cables from 2008-09. One of these involved a driller working in London in 2008, which came as a sobering reminder, if it were needed, about the risks faced by employees.

Survival during a recession has meant that companies have had to strive to maintain their competitive advantage by reacting quickly to the requests of clients. Unfortunately, this enthusiasm has not always been balanced with the legal requirement to reduce risk to a level as low as reasonably practicable.

Truncated start times and reductions in drilling rates are just two of the factors that have led to an industrywide philosophy best summarised as 'if we don't take the work then someone else will'. But, it is important that those placing staff in harm's way understand the risks they are taking and the standards they should be aiming for.

HSG47

To help companies discharge their legal obligations in relation to underground services, the HSE provides guidance in its publication 'HSG47 – Avoiding Danger from Underground Services'. An HSG document (Health and Safety Guidance) is issued by the HSE to outline suggested best practice, but it is not compulsory to follow it. Companies are free to take other action, but if they do follow the guidance they will normally be doing enough to comply with the law.

Health and safety inspectors seek to secure compliance with the law and may refer to this guidance as illustrating good practice, so understanding and applying it is important in preventing injuries and protecting against potential prosecution.

HSG47 outlines the requirements for any firm involved with work where there is a risk of contact with underground services. Companies need to have a safe system of work, which includes planning, maps and plans, cable and pipe-locating devices and safe digging practices. A safe system of work recognises that it is impossible to eliminate all risk, but rather relies on people for it to be effective. Therefore, staff must be trained to follow it and understand any limitations.

RISK MANAGEMENT

Within health and safety management there are two methods of managing risk where people are involved.

The first is known as the 'safe workplace concept' where risks associated with the workplace are eliminated or managed. The concept requires a well-controlled and static environment, where the actions of the employee can be largely discounted (the risk-control measures override human actions). Unfortunately, this is impossible to apply to the drilling and geotechnical sectors as workplaces are highly dynamic and risk controls rarely 'engineered'.

In such instances, safety practitioners refer to the second method, namely the 'safe person concept'. Here, staff are highly trained and, as a result, can apply risk controls dynamically, as appropriate to the specific risk.

It is this area that is currently of concern to industry safety professionals. Engineers, drillers, consultants and directors are too often unaware of the risks they face, and are unsure how to apply the requirements of HSG47. The safe system of work will only be effective if everyone involved is trained in all aspects and able to apply the correct controls.

This is an area of weakness in the geotechnical sector as few in the industry receive training beyond how to use a cable avoidance tool (CAT). Many of the working practices being used expose staff to an unacceptable level of risk and, to a large extent, everyone turns a blind eye. It is these factors and the levels of training for operatives, consultants and engineers that need to be addressed so that working practices can improve.

RPA SAFETY SERVICES

For these reasons, RPA Safety Services in partnership with Equipe Training have developed a new and unique training course. This training day has been accredited by the Institute of Occupational Safety and Health (IOSH).

The course aims to develop the 'safe person' concept by providing engineers, consultants and drillers with an understanding of what is in the ground, how to interpret maps and plans, use CATs and signal generators, and interpret visual evidence. Above all, students are taught the importance of risk assessment in relation to buried services and to apply this skill to their company's safe working practices, which generally include maps and plans, CATs and the digging of starter pits.

Planning the work is the initial stage outlined in HSG47. Understanding the site, its history and the nature and location of any services will initially determine the cost of the work, and should form part of the pre-tender process.

Determining the extent of hand digging or selecting the appropriate detection technology can only be done if the utility plans have been consulted. Failure to do this means that the contractor or client will not be discharging their duty of care. This could result in prosecution under the Construction Design and Management Regulations 2007.

The second stage of HSG47 – maps and plans – are only useful to those who understand their limitations. Utility providers acknowledge their services rarely run in straight lines and that surface depths may have changed. Datums such as kerb lines may have been moved and plans may only run to site boundaries. They all carry disclaimers to this extent and, as a result, their omission is often condoned, but they still provide valuable information for those locating services in the area.

Maps and plans are best supplemented through the use of appropriate cable and pipe-locating technologies. In most instances the appropriate cable-locating technology will be a basic CAT to verify the accuracy of utility plans or detect the presence of services not indicated. However, CATs will not detect plastic or earthenware pipes, may struggle to detect cables with no load and, in some cases, three-phase cables where the load is well balanced such as high-voltage feeds to substations.

It is in these areas that signal generators are vital,

subterranean services

but it is disturbing how few people are comfortable with using them. The equipment is all too often taken to site, but not used. In many cases the accessories have never even been unwrapped. This can be overcome with simple practical and theoretical training, and dramatically extends the number of services that a CAT can detect.

At the other end of the scale are ground-probing radar. Often advertised as the answer to all service location problems, they are expensive, may not detect all ground anomalies, are sensitive to ground conditions and struggle to detect small-diameter utilities. They must not be used to replace utility plans or CATs, and those specifying and operating them must understand how they work and their limitations, and be able to interpret the results.

HSG47 places great emphasis on the importance of finding services before mechanical work begins, and this is currently the greatest area of weakness within drilling and geotechnical work.

The predominant practice in the geotechnical and drilling industry is to scan the area for services and then dig a pit to 1.2m before drilling. When drillers and engineers attend training courses they all report striking services below 1.2m, caused by a common misconception regarding the maximum depth of services in the ground.



If this gas pipe had been located in accordance with HSG47, an expensive fracture repair could have been avoided

HSG47 states that mechanical equipment must not be used until services have been located. So, if the service on a plan has not been found, the utility provider should be contacted and it must be assumed that it is underneath the area planned for work. More emphasis needs to be placed on finding services rather than checking the area is clear.

Additionally, safe digging relies on the careful use of tools; only using pins and bars to free rocks and other debris, rather than the current practice of driving tools into the ground to achieve a 1.2m depth. Hand-digging must not be abandoned, but should be used to positively identify services in the area and confirm changes in geology or fill, which may indicate utility presence.

These issues and more are openly discussed on the training course. With assessment of the practical elements and external verification of understanding, candidates will leave with the ability to apply their learning on site to the benefit of their employers. Importantly, their certification comes with the IOSH badge and should be accepted by clients as proof of a full understanding of HSG47.

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