

Making a start

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IT IS interesting to read Niranjan Swarup's article (p6) on his blueprint for the advancement of trenchless education and training in India.

With its population of 1.2 billion (and growing rapidly), India – as is well known – is experiencing rapid urbanisation, and needs to provide adequate services and infrastructure to accommodate this growth. That is not to mention the rehabilitation requirements of its existing, dilapidated infrastructure.

Within this scenario, there is enormous scope for trenchless technology as a solutions provider, but that implies the availability of a growing number of qualified and knowledgeable personnel at all levels.

But how do you get the trenchless sector off the ground where there is both a lack of knowledgeable skilled people and no real formal system of training and education in the sector? Trenchless technology used in such situations can lead to failures of the type seen recently in Delhi in the run-up to the 2010 Commonwealth Games, when numerous road surface subsidences were attributed to poorly executed or inappropriate trenchless operations.

Such scenarios put India in a difficult position and the country currently faces the dilemma faced by many developing countries wanting to grow their domestic trenchless sectors. Do you use imported professionals and thereby increase project costs (surely not the way forward for the trenchless sector); or use local untrained/unskilled labour (a politically attractive proposition for a labour-rich country), which will almost certainly increase risks and give no-dig

a bad reputation, thereby further hampering its take-up?

As a solution to this dilemma, it is heartening to read the Indian Society of Trenchless Technology's (IndSTT's) proposals to advance trenchless skills and education in India. For example, starting this year, IndSTT has already achieved encouraging results by persuading project owners to use its established competency standards to evaluate people before they are employed on trenchless project sites. That should go some way to increase standards and avoid the type of unfortunate mishaps that were seen in Delhi.

But that is just the start – much more has to be done to increase awareness and convince project owners that a plentiful supply of unskilled labour is not necessarily the answer to the nation's problems.

Prof Swarup outlines a four-tier approach to tackling the education problem in the trenchless sector. This ranges from the basic foundation level required by anyone wanting to work in the sector; through the global knowledge required by planners; up to the next level of knowledge required that enables a more analytical understanding (such as that required by, say, designers); and finally, the highest knowledge levels required by facilitators of trenchless projects.

It may all sound a bit too academic for imparting the basics of trenchless technology, but you have to start somewhere. The IndSTT should be applauded for continuing its efforts to ensure that the take-up of trenchless technology in a third-world country such as India is as seamless as possible.

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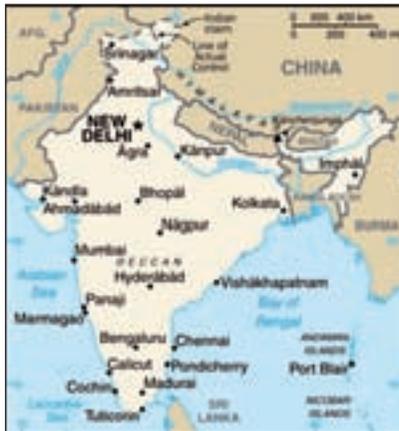
A roadmap for no-dig education

Niranjan Swarup of IndSTT argues the need for structured training to fill gaps in Indian expertise

IN THE run-up to the 2010 Commonwealth Games in Delhi, the capital witnessed 22 road cave-ins during one monsoon month.

Many of these occurred due to road surface subsidences triggered by soil movements in excavations created during inappropriate trenchless operations.

It is clear that, with India's explosive urban growth, trenchless technology requirements are also growing. However, till now, there has been no structured education and training available to the nation. Yet there is a pressing need to train and develop professionals in this field who can function as mentors to guide and motivate students thinking of joining the sector.



PROJECT INADEQUACIES

To avoid project failure, the trenchless construction activity sequence warrants a comparatively flawless complement of materials, consumables, equipment, and crews; shortcomings in any of these critical inputs can lead to complete project failure. By their very nature, trenchless operations require great precision. It is therefore important to develop proficient professionals, who can perform under the expected conditions.

KNOWLEDGE-BASE NEEDS

The national knowledge base required should be enough to educate professionals in the technology or give them the ability to execute projects. This would be at four levels, depending on project needs/investments (see box):

KNOWLEDGE GAPS

The fact that these competencies are almost absent in our home-grown engineering graduates means that most of the major project execution agencies are compelled to engage

foreign professionals (which increases costs) or use un/under-qualified professionals available locally (which increases risk).

Until recently, even the mechanism to evaluate the competencies of so-called trenchless professionals was under-developed, the maximum check generally being to verify copies of project execution certificates, thereby making the process subjective. Even today, many employers are forced to follow the same process due to the paucity of qualified professionals.

It is gratifying to note that, from this year, project owners have started to use IndSTT's established competency standards to evaluate trenchless professionals before their deployment at project sites. This is a welcome development, but in the face of national requirements, it is a small degree of progress; more efforts are needed.

PRACTICES IN DEVELOPMENT

It is imperative we develop professionals with the right proficiencies, so that adequate national trenchless capacities are created to meet the industry's needs. In India, trenchless proficiencies are cultivated unconventionally, mostly by on-the-job training. These training efforts lack the proper curriculum and programme structure since trainees only become exposed to the elements necessary to complete a specific project; however, that knowledge may not be relevant to other projects of a different nature, even though the certificate may not say so.

THE WAY FORWARD

The way ahead is to provide structured training to professionals for the identified competency levels. Once a formal exposure to the global picture is provided, individuals can progress to specialising in their chosen area.

Training for the first two levels could be for all professional students undergoing degree or diploma programmes. Candidates passing out from engineering colleges and polytechnics are taught the preliminaries of the branch-specific engineering so they are able to perform as team members at the first level of knowledge in specific operations. Armed with such basic knowledge of trenchless techniques, the candidate would be able to perform in a similar way to his contemporaries in other branches.

The next two levels, aimed at specialisation, should be imparted to practising engineering professionals or candidates going for masters/post-graduation degree programmes. This would also require ample exposure to trenchless equipment and working practices. So the training needs to be imparted via a mix of classroom training and relevant project work through site experience. Only in this way can India build capabilities in the sector.

Four levels of knowledge-base needs

• Trenchless associates

This is the first level of knowledge required by anyone wanting to work in the sector. It also is the starting point for the next knowledge-base levels.

• Trenchless planners

The second knowledge level can empower individuals to plan the project on a holistic basis. This level is of use to planners who, in addition to basic technology awareness, also require the global perspective so that they can successfully plan an underground project.

• Trenchless designers

The next level of knowledge provides the analytical abilities to empower professionals to conduct design calculations, material and

equipment sizing, consumable selections and logistical planning. It is also of use to project owners who want to undertake project engineering. Project-executing agencies such as contracting companies, equipment manufacturers/suppliers and consumable manufacturers also require such professionals for their operations.

• Trenchless executors

The fourth level of knowledge covers the entire sector-specific know-how and helps the industry physically execute and conclude trenchless projects. The combination of these four proficiency levels would be able to fill the competency gaps being experienced in India's trenchless industry.

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