"ACT has been the gateway for many demolition technologies."

– **Mohan Ramanathan,** *Managing Director, Advanced Construction Technologies (P) Ltd*

What is the status of the demolition industry? Are there rules or guidelines in this business? Are the methods adopted at par with international standards? How safe are the methodologies adopted? EQUIPMENT INDIA seeks and receives some answers from Mohan Ramanathan, Managing Director, Advanced Construction Technologies (P) Ltd, sometimes known as the 'the demolition man.'

The demolition equipment sector has a great future in India. Re-development of walled cities, better utilisation of land and rapid industrial advancement all demand easy availability of cost effective and well defined technologies. As regards the requirements the demolition technology should fulfill, the ideal list goes like this: quicker, quieter, cheaper, and environment-friendly, which causes least disturbances in the neighbourhood, and minimal impact to the workers. **Agith G Antony** interacts with **Mohan Ramanathan, Managing Director, ACT**, who pioneered the art of controlled demolition of structures using collapse analysis and explosives, as well as the use of hydraulic concrete crusher for silent demolition of structures in India. A thorough professional, Ramanathan went on to pioneer the use of modern equipment for concrete flat work construction such as power trowels, truss screeds and joint saws, and introduce a new construction

Demolition of T2A Terminal at Mumbai International Airport Ltd using hydraulic crushers.

"Industrial demolition and reconstruction combined with recycling can be a sustainable business proposition."

– Mohan Ramanathan, *Managing Director, Advanced Construction Technologies (P) Ltd*

A proper understanding of structure and use of appropriate methods can avoid accidents.

technique for mini trenching in concrete pavements using Erkat drum cutter at Delhi International Airport (DIAL) for Larsen & Toubro Ltd. Excerpts from the interview.

Is the demolition industry organised in India, and what is the potential of this industry in the country?

In India, demolition has not been given due importance. Neither are there rules or guidelines in this business nor does the BIS (Bureau of Indian Standards) have a Code of Practice dedicated to demolition. Usually, demolitions are carried out by scrap merchants, who are in the business of scrap and salvageable materials. Currently, India has great potential for organised demolition companies. Industrial demolition and reconstruction has a huge potential in the coming years. If it can be combined with recycling, it can be a sustainable business proposition.

It is noticed that there are no planned methods to execute what is an important and integral part of civil engineering: demolition. Your views on this?

Demolition is not an exact science, but more often, an art. Demolition should be performance driven rather then specification driven. Modern demolition techniques such as diamond cutting, controlled demolition, and implosion, etc, all require careful planning and detailed methods statement for ensuring success. Most accidents during demolitions happen due to poor understanding of the structure or use of inappropriate methods.

What are the latest trends, especially in the use of equipment/and methods, in the demolition field in India? Is it at par with international practices?

When compared to the Western world, India lags behind by at least two decades. Though hydraulic breakers made their first impact in India over 15 years ago, they are being used for demolition only since the last five years. I had introduced implosion technology to India in 1996 through my collaborator, CDI of USA. In 1997 I

COMPANIES ACT REPRESENTS

- Volvo, Sweden; manufacturers of heavy construction equipment like excavators, wheel loaders, graders, articulated haulers, road machinery like pavers, compactors, etc.
- Atlas Copco, Sweden; manufacturer for range of construction equipment.
- CAMAC, Spain; manufacturers of rack and pinion hoists.
- Erkat GmbH Germany: drum cutters
- Wacker Neuson, Germany; light construction equipment.
- CDI, USA; implosion technology specialists.
- Deutz, Germany; engine manufacturers.

Demolition of ramp at Mumbai International Airport Ltd.

TECHNOLOGIES INTRODUCED

- Pioneered the art of diamond cutting technology in India in 1994 and implemented it in several complicated contracts related to selective and controlled dismantling of structures.
- Implemented implosion technology in collaboration with Controlled Demolition Inc., USA, in 1997.
- Introduced direct burial of cables, DBC, a new technology, which completely harnesses the power of diamond cutting technology, used for laying OFCs for telecommunication service providers, in-house network connections, etc.
- Introduced DBC and DBD technology to a telecom company in Saudi Arabia. Worked in capacity of technology partner with Dicotech LLC, a retrofitting specialists company in Dubai, United Arab Emirates.
- Introduced the silent demolition technology to India in 2006, by bringing the hydraulic concrete crusher mounted on an excavator.
- Recently brought to India, Asia's first high reach demolition excavator that can reach buildings upto 28 m.

introduced diamond wire sawing for Tata Steel's industrial demolition. Again, in 2006, I brought in silent demolition to India, by bringing the hydraulic concrete crusher mounted on excavator. In the last decade, many entrepreneurs have followed suit and have begun servicing the construction industry. Today, diamond sawing and the use of hydraulic breakers are two popular and widely used techniques.

Do we use explosive demolition technology, i.e., the telescopic technique by placing explosives?

Controlled demolition using explosives is called implosion. This technique is best suited for tall buildings and structures which are generally over 20 m in height. I have used this technique of implosion for fast demolition of old cooling towers in 1996. I am considering it for several on - going current projects, too.

Are our site conditions conducive to this type of technique?

Demolition of structures in the urban landscape in India is always a challenge. We have to deal with many external factors which are unique to India. Use of explosives is also taboo in our politically sensitive metropolitan cities. Indian site conditions are entirely different from Western demolition sites. Safety is not the primary factor in most Indian demolition sites.

What about chemical techniques?

Chemical techniques are more suitable for rock excavations. They are expensive and unpredictable in results. They are gradually giving way to mechanical methods.

What are the occupational hazards encountered in a demolition job? And what kind of precautions do we normally adopt?

Demolition activity is more risky than construction. There are no strict occupational hazard standards for the construction industry in India. It's only recently that we have even seen the rudimentary safety helmet at our construction sites. Demolition produces noise, dust, vibration and falling/flying debris. The degree of each pollutant/hazard is a function of the method used for demolition. Risk to the worker is highest in a demolition site; only

Demolition of low rise structures using normal hydraulic excavator fitted with hydraulic crushers.

Concrete trenching using Drum cutter at Delhi International Airport, New Delhi

Demolition of high rise building using specialized high reach machine. Special water spray machine used for dust control

trained workers should be allowed to carry out demolitions, to reduce accidents. Personal safety cannot be enforced, it has to be felt and followed by every worker.

Abroad, regulations exist to control dust and noise pollution during demolition?

India also has noise control regulations for construction equipment. In many Indian metros, court judgments have upheld PIL cases to ban noisy construction equipment from working near residential areas. Developed countries like Hong Kong have enforced very strict rules for noise and vibration control from demolition sites.

Dust is an inevitable by-product of demolition. There are no standards in India for controlling dust from construction sites, leave alone demolition sites. Recently, at ACT's demolition site at the Sahar International airport in Mumbai, we used a special dust control machine called the Dust Boss. This machine suppressed the dust from flying to the jet aircrafts nearby from the high reach demolition crusher and was found to very effective.

What are the parameters in selecting the methods and type of equipment for a particular demolition job? Also tell us about the cost factor?

All modern methods need not be costly. The method of demolition depends entirely on the client. Time and money are key factors for any client to decide. Time-saving methods, any day, are more expensive than the slower ones. If noise, dust, and vibrations are to be restricted, it will add to the cost of demolition. On plant shut-down jobs, where demolition is a key front end activity, time is the most critical factor and the key here is selecting the right demolition method, not its cost. Choice of the right equipment for a particular job depends on the availability of an agency to execute the job with specialised machinery. India has very few of these specialised agencies spread across the country, and more often than not, the client has little or no choice on the method of demolition.

How widespread is the use of hand-held breakers? And what are the safety measures taken to safeguard the operator from vibrations from these tools?

Hand-held breakers are used widely across India. Pneumatic breakers are very popular and are relatively cheap. Unskilled labour can usually handle these machines. Electric breakers are also very popular for small demolition jobs. They are capital intensive and high maintenance machines, too. Hand-held breakers use percussive action, and the vibrations from these machines, combined with the gripping force of the operation, tend to stop blood flow in the operator's fingers if operated over long continuous periods. Though some machines have special shock- absorbing handles, worker fatigue due to the machine's weight and percussive action, combined with a high pitch noise, are all hazards to the operator. Demolition robots (Brookk) in India is probably the most advanced technique in the world from the operator's comfort point of view.

What are the core competencies of your company?

Advanced Construction Technologies Pvt. Ltd (ACT) which I head, has been the gateway for many demolition technologies to enter India. With the contracting spirit in my blood and the passion to prove a technology, I have steered my company to the post of a pioneer in the field of demolition. Recently, I brought in the Asia's first high reach demolition excavator that can reach buildings upto 28 m. The pioneering spirit is the key factor that drives ACT.

What are the challenges that you face in this industry?

High capital cost. We have the highest customs duties in the world and all the specialised demolition machines have to be imported. The Indian construction industry also faces ignorance on the part of consultants and specifying authorities on the demolition methods. Since demolition is not a subject in any engineering curriculum, the civil engineering fraternity in India does not recognise it as an important construction activity requiring expertise. In fact, in USA, the term 'demolition' is slowly being replaced by the word 'deconstruction'. India has to start this young industry from the grassroots level and the challenge here is its development and sustainability for posterity. EI