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TERMINALS MAGAZINE

SUMMER 2020

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MAGNETIC ROBOTS BRING QUICKER, SAFER CLEANING TO STORAGE TERMINALS

High-pressure water jetting specialist Ammlee Group provides safer, quicker and more effective cleaning to storage terminals, with its robotic hydroblasting equipment.

The company uses a magnetic crawler robot that moves up and down tanks while aiming a 2,800-bar water jet at the surface.

Hydroblasting works in a similar way to sandblasting (ie. removing the coating and leaving the tank surface prepared for painting) but using water.

The same technique can also be used on ships, heat exchangers, pipelines and other large-scale cleaning projects. In smaller areas, a hand-held water jet and rotating nozzle can achieve the same results.

Ammlee founder Neal McArthur said: "We achieve better results than sandblasting without the need for harmful chemicals or anything that's going to create a mess. It's just water, but it's very powerful and very effective."

Ammlee also uses its powerful water jets to carry out hydrodemolition, providing a precise, environmentally-friendly and cost-effective way to demolish buildings and other structures.

Neal added: "Using robotic equipment and powerful water jets, we carry out demolition projects accurately and cleanly. We can clear away any unwanted structures, or parts of structures, without causing damage to the surrounding area."

Ammlee operates around the world, having completed industrial water jetting projects in countries including the UK, South Africa and Botswana. **www.ammleegroup.com** ■

Raising the bar for safety and productivity


David Kennedy, director, Water Jetting Association

Water jetting in all forms has become an indispensable maintenance tool for many industries across the world, not least oil and petrochemical production, processing and distribution.

It is used for cleaning and de-fouling a huge range of equipment, including storage tanks, heat exchanger pipe bundles, process vessels, large-diameter pipes and site drainage systems.

Water jetting is also used for surface preparation during construction and structural maintenance and intrinsically safe cold-cutting and hydrodemolition.

It delivers excellent results, is sustainable, controls pollution, is safer than alternative mechanical systems, and has key advantages in hazardous environments. Without water jetting, it is fair to say, the oil and petrochemical industries would grind to a halt.

A WATER JETTING 'GOLD STANDARD'

The growing importance of water jetting as an industrial process has seen it mature rapidly, with improvements to technology, capability and, most importantly, safety.

The Water Jetting Association (WJA) has been at the forefront of this drive to improve standards and safety. The WJA is the UK's member organisation for water jetting and is marking its 40th anniversary.

Established in 1980, it represents water jetting contractors, manufacturers, training providers, equipment hirers, and service users in the UK, many of which work for petrochemical and oil companies.

However, its influence extends internationally, thanks to the work carried out by its members across the world, notably in the Middle East, Asia, Africa and the USA.

From the date of its foundation in October 1980, encouraged by the UK's Health and Safety Executive, the WJA has also developed and continuously updated detailed water jetting codes of practice.

These are now widely recognised internationally as setting a respected and trusted "gold standard" for water jetting both for health and safety and effective service delivery.

This is important because it is becoming ever more crucial to work to agreed standards. Technical advances have extended the pressure range for water jetting. This has created new benefits and applications but also new safety issues.

Water jetting can be broadly categorised by operating pressure:

- ✓ Low pressure cleaning – below 340 bar (5,000psi). Also known as power washing or pressure washing.
- ✓ High pressure water cleaning – above 340 bar (5,000psi) and below 680 bar (10,000psi). Also known as high pressure washing.
- ✓ High pressure water jetting – above 680 bar (10,000psi) but below 1,700 bar (25,000 psi). Also known as high pressure water blasting.
- ✓ Ultra high pressure water jetting – above 1,700 bar (25,000 psi).
- ✓ Water jetting pressures are now exceeding 2,700 bar (40,000 psi). At these levels technical and safety challenges are considerable.

A STEP CHANGE IN EMERGENCY CARE

Even at lower pressures, though, water jetting presents serious risks. Fluid injection injuries, where water pierces the skin, can occur at pressures as low as 7 bar (100 psi).

> WJA members are at the forefront of new technologies that are improving safety and productivity and extending the reach of water jetting into ever more challenging environments.

It is a good reason why the priority is always to eliminate risk. But the WJA wants members to be prepared if the worst happens, which is why it introduced new water jetting injury management guidelines in 2019.

The guidelines are supported by an algorithm that details best practice actions at each step of the emergency response, from giving first aid to ongoing hospital care.

They are based on research commissioned by the WJA and carried out by a team of eminent UK emergency medicine physicians. Findings have been published in the European Journal of Trauma and Emergency Surgery.

The study found that treatment outcomes for people who suffer high pressure fluid injection injuries (HPFII) is often compromised because doctors fail to recognise their seriousness.

Directly addressing this issue, the WJA's new guidelines, incorporated into its codes of practice, are a major step change in our understanding of how to treat HPFII injuries and save lives.

For the first time, employers, first responders, paramedics and hospital medical teams have clear advice on optimum treatment protocols.

Intensive Care specialist Dr Sancho Rodriguez-Villar, of Kings College Hospital, London, who led the research team, concludes: "Without early and correct intervention, the outcome for those injured is often catastrophic, including death, loss of limbs and long-term disability.

Following this research, we strongly advise all parties involved to observe the WJA's updated guidelines for the management of high-pressure injection injuries."

INNOVATION IN WATER JETTING TRAINING

Training is fundamental to the safe and effective delivery of water jetting in all its forms. The WJA is the UK's largest provider of water jetting training across all industries.

Courses are also delivered internationally through WJA-approved training companies and instructors, many of them working for oil and petrochemical companies or their suppliers.

Training is based on the WJA's codes of practice – the 'Blue Code' for the use of high pressure and ultra high pressure water jetting equipment and the 'Red Code' for safe working and use of water jetting equipment in drains and sewers.

> Technical advances have extended the pressure range for water jetting

Courses are accredited by City & Guilds and delegates have to complete written tests to pass them.

To obtain a WJA water jetting operative's card and be registered on an international database, delegates must pass the one-day class-based Safety Awareness course and then one of four practical modules.

The syllabus of the Safety Awareness course includes water jetting principles, equipment types and operation, risk assessment, communication methods and first aid.

Practical one-day training modules are: Tube and Pipe Cleaning (TP), Surface Preparation (SP), Drain and Sewer Cleaning (DS), and Hydrodemolition (HD). There is also a half-day standalone pressure washing course.

To maintain certification, operatives must attend a Safety Awareness refresher course every three years. The practical module must only be passed once.

Many approved instructors are very experienced at working internationally, accommodating language and education differences in ways that maintain training and learning standards.

The WJA is also constantly developing its training portfolio to improve water jetting standards and support best operational practice.

For example, it has developed a Level 2 Diploma in Competent Water Jetting designed to give greater assurance that water jetting services are of a high standard.

The qualification introduces, for the first time, a proof of competence in water jetting. Operatives undergo work-based assessment, which is expected to last a year, but longer if necessary.

The WJA has also developed a new City & Guilds accredited water jetting management and leadership course.

This is because access to water jetting systems, and their range of uses, has broadened greatly. It has become vital for operational managers to have a good awareness of the factors that impact on the safe and effective use of water jetting.

CASE STUDY: WATER JETTING CLEARS COLLAPSED TANK ROOF

A challenging project to cut a collapsed roof inside a giant oil storage tank illustrates the benefits of water jetting when carried out by a trained and highly skilled team.

The external floating roof tank at the Forcados oil terminal, in Delta State, Nigeria, had been damaged during flooding.

The presence of volatile vapours and oil residue meant only heat-free cutting could be used, making water jetting the preferred methodology for the Nigerian contractor.

The solution was to use ultra high pressure abrasive water jet cutting to remove a structure with a diameter of 72 metres and an area of 4,070m2, equivalent to the pitch at Manchester United's Old Trafford stadium.

The task was carried out by a WJA member, with the project completed safely, with no reported incidents, ahead of schedule in 17 weeks.

Remote-controlled water jet equipment was set up on cutting tracks to cut an opening in the tank 35mm tank wall. It was then used to cut the roof into 110 segments that were removed with a pick and carry crane.

Once the cut out storage tank section was replaced, a new roof could be fitted, returning the tank to service.

ROBOTICS AND INTERNATIONAL COLLABORATION

WJA members are at the forefront of new technologies that are improving safety and productivity and extending the reach of water jetting into ever more challenging environments.

An example is the use of robotic water jetting, or semi-automated water jetting as it is also called. Robotic systems can improve productivity, especially when applied across large areas.

They are also safer to use. According to a hierarchy of control in the WJA's codes of practice, if an operative can be moved away from water jets leaving nozzles at over twice the speed of sound they should be.

Water jetting with hand-held lances is also a highly skilled process that can take a long time to fully learn. In some cases, robotic systems allow contractors to jump a technology generation and benefit from automation.

However, operatives still need to be trained. They must understand the principles behind the behaviour and use of water at high and ultra high pressure. Procedures for the safe use of these processes need to be learned and applied.

Which is why WJA water jetting training is still essential. Any organisation requiring water jetting training should contact the WJA in the first instance.

The WJA also welcomes international members and opportunities to collaborate with companies and business organisations. We want to share ideas and improve standards for the water jetting industry and its clients.

Author: David Kennedy, director of the Water Jetting Association.
www.waterjetting.org.uk ■

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Ammlee Group is your trusted industrial water jetting partner.

We carry out hydro blasting, hydro demolition and Vacuuming that deliver to the highest standards of safety, accuracy and environmental friendliness.

Our experience has been built over more than 20 years in the industry. We have worked on some of the toughest industrial sites in the world, including tube cleaning two miles below the surface at Mponeng Gold Mine, in South Africa, which is the world's deepest mine, and conducting cleaning shutdowns of the enormous Sasol power plants.

Services offered:

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CLEANING UP THE INDUSTRY

The Scanjet SC 60A is an advanced and robust tank cleaning nozzle especially designed for crude oil storage tanks and similar extreme applications

Among the many challenges of crude oil tank cleaning is that the cleaning medium, crude oil, invariably contains large quantities of suspended solids. The SC 60A can cope with solids of particle size several times that of conventional cleaning nozzles – meaning you spend more time cleaning the tanks, and less time clearing the nozzles.

The pneumatically-driven SC 60A is programmable for sector cleaning, so the cleaning effort can be focused only where required – therefore saving you valuable time and energy.

Thanks to its ultra-slim design, the SC 60A can be inserted into a tank via the floating-roof support leg apertures and other similar existing openings – no new holes need to be cut or made up afterwards.

And last but not least, like all Scanjet models, the SC 60A is engineered for superior operating efficiency, maximum robustness and reliability, and long service intervals with minimal maintenance requirements – delivering the lowest total cost of ownership, now and in the long run.

Certified for operation in ATEX Zone 0 and 1 environments.
www.scanjetsystems.com ■

> You spend more time cleaning the tanks, and less time clearing the nozzles