

Hydrodemolition Surface Preparation Keeps Liberty Tunnels Rehabilitation Project on Schedule in Pittsburgh, See article on page 2



Two Conjet Robot 363 hydrodemolition machines have been adapted to suit the curvature of the horseshoe shaped walls of the two Liberty Tunnels. See article, page 2.

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WJTA-IMCA Conference and Expo
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Call for Papers and Case Studies
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Hydrodemolition Surface Preparation Keeps Liberty Tunnels Rehabilitation Project on Schedule in Pittsburgh, from page 1

The Pennsylvania Department of Transportation selected hydrodemolition surface preparation for the \$18.8M (€15.1M) rehabilitation of Pittsburgh's Liberty Tunnels, because time was of the essence to complete the project on deadline without penalties. Hydrodemolition, the fastest and most cost effective method, was utilized to prepare the tunnel walls for a new, shotcrete surface.

Because of hydrodemolition's quick concrete removal and easy cleanup, contractors are able to work faster than with conventional concrete removal methods. This allows them to work within the project's limited hours of access to the job site and avoid heavy penalties for not opening the tunnels to traffic by the daily deadline. In addition, no damage or cracking of the tunnel walls has occurred using hydrodemolition, as often occurs when pneumatic jackhammer techniques are used.

The project will increase the service life of the Liberty Tunnels as well as reduce maintenance cost, increase visibility for drivers and repair deterioration from 90 years of wear and tear. The entire area to be removed will be 212,960 ft² (19,785 m²) of concrete, the equivalent of nearly four football fields. Since the hydrodemolition began in April 2013, the travelling public has experienced few delays. Hydrodemolition makes it possible to remove concrete between the hours of 10 p.m. and 6 a.m.

Because it is more efficient than jackhammers, hydrodemolition is only a fraction of the cost, according to Ed Liberati, chief engineer at Hydro-Technologies, Inc., subcontractor for the Liberty Tunnels project. Contractors working on the project include



The Conjet Robot 363 adapted to suit the curvature of the horseshoe shaped walls.

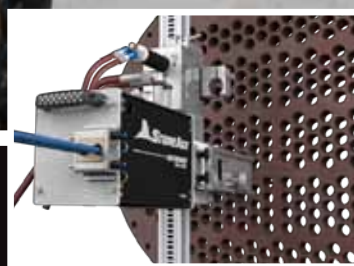
general contractor Swank Associates based in Apollo, Pennsylvania; HTNE Hydrodemolition Service LLC, based in New Kensington, Pennsylvania; and Hydro-Technologies, Inc., based in Jeffersonville, Indiana.

The Liberty Tunnels are a pair of tunnels, 5,889 ft (1,795 m) long that allow motorists to travel between the South Hills of Pittsburgh and the city, through Mount Washington. There is an inbound tunnel and an outbound tunnel, each with two lanes of traffic. The tunnels were constructed from 1922 to 1924 and were vital in the expansion of the South Hills suburbs by providing a direct route to the city, eliminating the time-consuming task of navigating around or over Mount Washington. Repairs are difficult with a traffic volume of 48,000 vehicles daily and extremely heavy traffic during rush hours and special events in Pittsburgh.

The heavy traffic, limited hours and special events have made the rehabilitation of the tunnels extremely difficult. "It's a heck of an undertaking," says Liberati. Every night the hydrodemolition equipment and crews enter the tunnel after the closure and get as much done as possible before shutting down the equipment, cleaning up debris, then exiting the tunnel before the 6 a.m. opening. If the tunnel is not opened by 6 a.m., the contractor would be assessed liquidated damages of \$7,800/h (€6,264/h) until the tunnel is opened to traffic. That leaves only eight work hours per night. During sporting events and concerts, the hours are slashed even further. After the Pittsburgh Pirates games, for example, construction could not begin until midnight. Hydrodemolition makes it possible to work within these hours and avoid penalties because of the relative ease of clean-up and the speed of the removal.

(continued on page 4)

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Hydrodemolition Surface Preparation Keeps Liberty Tunnels Rehabilitation Project on Schedule in Pittsburgh, from page 2

For the Liberty Tunnels project, hydrodemolition was superior to other methods of removing the deteriorated concrete from the tunnel walls such as jackhammers. Hydrodemolition only necessitates three to four people to operate the robots whereas jackhammers would have needed around 30 workers. "Another option, building a new tunnel from scratch, would have cost the state hundreds of millions of dollars," says Liberati.

"Given the allowable working hours, there would be no chance to complete the job in one construction season using different methods," says Denis Mazzoni, project manager at Swank Associates, the general contractor for the Liberty Tunnels project.

Hydrodemolition utilizes a high-pressure waterjet operated by a hydrodemolition robot. On the Liberty Tunnels project, two Conjet 363 vertical robotic units performed partial depth, selective removal hydrodemolition on the tunnels' vertical wall horse-shoe profiles that have 14.5 ft (4.42 m) posted vertical clearance. The Conjet 363 vertical hydrodemolition robots' waterjets are controlled by an experienced technician and are operated over the entire surface of the tunnel walls. The flow rate, pressure, dwell time and cutting head are computer-controlled to consistently provide the ideal settings required to selectively remove deteriorated concrete while leaving the sound concrete intact.

The Conjet robot is versatile for high-speed, selective, vibration free removal of damaged concrete. Powered by a 15 hp (11 kW) electric motor, Robot 363 can handle the rotors and the oscillation tools efficiently. It can withstand reaction forces working

with high-pressure pumps up to 737 hp (550 kW). The removal area can be as wide as 6 ft 7 in (2 m). Robots also have the time saving function to simultaneously make two separate cuts with different depths and widths. After the hydrodemolition removal is performed, the entire surface is water-blasted resulting in a high quality surface that is ready for the shotcrete application. Shotcrete is a concrete spray that will be applied after hydrodemolition removes the deteriorated concrete from the tunnel walls.

There are three types of tunnel repairs where hydrodemolition will be used. Type one includes areas where the surface of the existing concrete will be removed to a depth of 1 inch (25 mm) during removal of the existing wall finish and in preparation for the placement of a 1 inch (25 mm) shotcrete repair. Type two includes areas where deteriorated concrete extends to a depth greater than 1 inch (25 mm), but not deeper than the steel reinforcing bars. Type three includes areas where deteriorated concrete extends beyond the reinforcing bars, exposing more of the bar surface.

Hydrodemolition in the U.S. was initially confined to bridges, but now it is used on bridge decks, piers, factories, and military bases or wherever deteriorated, reinforced concrete has to be removed by the owner to rehabilitate and preserve a structure. The Pennsylvania Department of Transportation has recently specified hydrodemolition for a wall rehabilitation project on State Route 51.

For more information, visit www.conjet.com, call +46-(0) 8-5565-2240, or email: lars.nilsson@conjet.com.

Deadline for Abstract Submissions Extended

To ensure the most valuable and up-to-date conference program, WJTA-IMCA has extended the deadline for abstract submissions to March 31, 2015. Don't miss your chance to share your research, applications, and case studies in New Orleans at the WJTA-IMCA Conference & Expo, Nov. 2-4, 2015.

The WJTA-IMCA Conference & Expo has a specific focus on all aspects of fluid jet and industrial cleaning technology, providing an excellent opportunity to network, learn and share with leading industry figures from around the world.

Papers will primarily focus on the following areas:

- Waterjet cutting
- Waterjet cleaning
- Vacuum/air mover technology
- Industrial cleaning
- Surface prep/coating removal
- Hydrodemolition
- Excavation, tunneling, and mining applications
- Novel waterjet applications
- Safety
- Jet dynamics and modelling
- Robotics/automation
- Market and future needs

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American Industrial Partners Bets on Water Jets

By James R. Hagerty

The idea of using water to slice through glass, metal and granite has been slow to catch on.

But the New York-based private-equity firm American Industrial Partners is betting it can transform so-called water-jet technology into a bigger and faster-growing business. The firm spent \$350 million over the past 16 months to buy two of the world's largest water-jet firms, Flow International Corp. and KMT Waterjet, both U.S. based. It aims to promote one of the technology's main advantages – it doesn't create heat – amid growing use of composite materials, including plastics, that can melt when cut with lasers or torches.

Available since the early 1980s, the machines pump water at extremely high pressure into a narrow tube. The water is mixed with abrasives, usually sand-like bits of garnet, often from the Adirondack Mountains or beaches as far away as India. When blasted from a nozzle in a stream about the width of a safety pin, the water moves three times as fast as a jetliner and can cut rock, steel or virtually any other material.

"I've cut seven-inch-thick steel with a water jet," says Kevin Siverd, a vice president at MetPlas Inc., a machine shop near Pittsburgh that makes industrial parts.

Other types of water jets, without abrasive materials, are used to cut softer materials, such as celery, diaper cloth and automotive fabrics.

Water jets haven't lived up to their promoters' hopes. "I thought it would be much bigger," says Mohamed Hashish, an Egyptian-born pioneer of the industry who wrote a doctoral thesis on water-jet technology and has worked for Flow since 1979.

Water jets, typically costing between \$100,000 and \$400,000, compete with a wide variety of other cutting tools, including diamond-edged saw blades, lasers and plasma torches. Although they cut without creating heat, which can melt or warp materials, they inevitably involve moisture, making them inappropriate for some electronic substances.

Another obstacle is that many potential users don't know much about the technology, industry officials say. "There is still a need of evangelism" to spread word about the technology, says David Savage, chief executive of Waterjet Holdings, which was set up by American Industrial as a holding company for the two firms it bought.

The global market for water-jet equipment and supplies totals about \$750 million and is likely to grow 5% to 6% this year, Mr. Savage says. He estimates that water jets account for 10% of the global sales of "nontraditional" cutting tools, including cutters that use plasma, lasers or electrical currents. As many as 20,000 water jets are installed worldwide, according to industry estimates.

Kim Marvin, a partner at American Industrial, says the private-equity firm got interested in water jets after acquiring a maker of molds and parts used in making aircraft. Delving into the aerospace industry, American Industrial's executives concluded that more water-jet machines would be needed to trim and shape the lightweight composite materials increasingly used in aircraft and cars.

Suppliers to Boeing Co. have long used water jets, and BMW AG says the technology is being used for its new Project I electric cars.

Flow, the world's biggest maker of water-jet equipment, had suffered in recent years from sluggish sales growth

and was pressured by activist shareholders to improve returns. Five months after its board put the Kent, Wash.-based company on the block in April 2013, American Industrial emerged as the winning bidder, paying about \$200 million, or \$4.05 a share. Flow traded at more than \$14 a share in mid-2006.

Both Flow and KMT, which was acquired by Industrial in 2013 for \$148 million, suffered from a common ailment of companies run by engineers, says Mr. Marvin: "They were more focused on the intricacies and the marvelous aspects of the technology than they were on figuring out how customers could apply it."

Flow and KMT have combined annual sales of about \$390 million.

One of their biggest U.S. rivals is OMAX Corp., with sales of more than \$80 million. It was formed in 1993 by John Cheung and John Olsen, who both defected from Flow. "When we started, we thought that every machine shop should have a water jet," says Mr. Cheung, CEO of OMAX. "Obviously, that's still not the case."

Some converts rely heavily on the technology. In the Philadelphia suburb of Fort Washington, Granite Galleria uses an OMAX water jet to cut kitchen countertops. "It's a great machine," says Savino Costanzo, who bought his for about \$120,000, partly because it didn't kick up dust. The water jet is used for more intricate work, such as openings for sinks, while a traditional saw, which costs less to operate, is used to cut simple straight lines.

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Wasserstein & Co. to Sell High Pressure Equipment Company

Wasserstein & Co., on behalf of its private equity fund Wasserstein Partners III, announced that it has entered into a definitive agreement for the sale of High Pressure Equipment Company (HiP) to Graco Inc. for \$160 million. The transaction is subject to customary regulatory review and is expected to close in the first quarter of 2015. HiP has been a portfolio company of Wasserstein Partners III since June 2012.

“We are very grateful to all of the employees of High Pressure Equipment Company,” says Robert Fogelson, senior partner of Wasserstein. “It

has been a particular pleasure to work closely with Larry Loper and Larry Serafin, who have flawlessly executed on the growth strategy set in place two and a half years ago.”

Dr. Rengarajan Ramesh, partner of Wasserstein, says, “We wish the HiP team every continued success. The Company’s unique culture and specialized capabilities will serve it well in moving forward to the next chapter of its 60-year history.”

Lawrence Loper, president of HiP, says, “We have greatly enjoyed our

collaboration with Wasserstein. During Wasserstein’s ownership, HiP has positioned itself for sustainable, long term growth as we enter our seventh decade serving the global high pressure industry.” Houlihan Lokey provided financial advice to HiP and Skadden, Arps, Slate, Meagher & Flom was legal counsel.

For more information, visit www.highpressure.com.

HiP Featured on ‘Manufacturing Marvels’

High Pressure Equipment Company (HiP) was recently showcased on the prime-time business production *Manufacturing Marvels*® on The Fox Business Network.

The two-minute *Manufacturing Marvels* features spotlight successful American manufacturers and their products.

The September and October shows, narrated by John Criswell, told an international audience how Erie, PA-based HiP’s unique high pressure valves, fittings and tubing provide dependable and safe operation at some of the highest pressures and most extreme environments in the world.

“When elevated pressure is needed to perform a task, High Pressure Equipment Company is on the job,” Criswell says. “HiP’s valves and related components are designed to provide leak-free service at pressures ranging from 10,000 to 100,000 psi.”

The spot shared that ISO-9000 certified HiP boasts a 60-year history of earning customer loyalty by providing

the highest quality products backed by superior service, in industries including waterjet, oil and gas, chemical and petrochemical and education. HiP’s extensive inventory, same-day shipping on many orders and special orders for custom products were also mentioned.

In addition to high pressure valves, the feature also highlighted HiP’s 250 types of reactors and pressure vessels, its pumping systems with output pressures up to 90,000 psi and its hydraulic intensifiers that can increase pressures to 150,000 psi.

The business featured closed with Criswell inviting the audience to visit HighPressure.com to learn more about the company and its products.

See HiP’s *Manufacturing Marvels* episode online at www.highpressure.com.

Jet News is published by the WaterJet Technology Association (WJTA)-Industrial & Municipal Cleaning Association (IMCA) and is a benefit of membership in the Association.

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WJTA-IMCA Safety Manuals

One of the WJTA-IMCA’s primary goals is to improve safety within the industry. *The Recommended Practices for the Use of High Pressure Waterjetting Equipment* provides recommendations for the safe and efficient operation of high pressure waterjetting equipment. It is often used in the training of operators and new employees.

The new Spanish edition contains all the updates and revisions of the English-language 5th edition, including the new and expanded recommendations on color coding, design criteria, establishment of a hydroblasting zone, hose inspections and testing, safety shrouds, and more.

The new translated manual is ideal for sharing the safety recommendations of WJTA-IMCA with Spanish-speaking employees, colleagues, and customers.

Place your order online through WJTA-IMCA’s secure online store at www.wjta.org, or contact the WJTA-IMCA office by phone or email.

Jetstream's hands-free waterblast solutions deliver improved operator safety, productivity

Provides broadest offering of hands-free cleaning solutions and training in the industry

Jetstream of Houston, LLP, a leading manufacturer of industrial high-pressure waterblasting equipment, parts and accessories, continues to invest and grow in providing industrial cleaning contractors with the most productive hands-free solutions available. By partnering with the leading manufacturers of automated tools and robotics – including Aquajet Systems, Peinemann, StoneAge and Terydon, Jetstream offers the industry's best total equipment solutions for such hands-free, high-pressure waterblasting applications as hydrodemolition, pipe cleaning, surface cleaning and preparation, tank and vessel cleaning and tube cleaning.

"These strategic partnerships enhance Jetstream's product offering and provide customers with greater access to category-leading specialty equipment and accessories that enhance operator safety and productivity and help contractors perform their jobs more profitably," said Joe Varca, business unit director at Jetstream. "The collaboration with these well-known automation partners, combined with our nine FS Solutions authorized retail support and rental centers across the United States, enables Jetstream to better meet our customers' needs for total hands-free solutions, including the purchase and/or rental of Jetstream waterblasting equipment, parts, accessories, training and service support."

With the goal of reducing the number of workplace fatalities and injuries related to improper use of high-pressure waterblasting and providing a safer environment for equipment operators, Jetstream is developing and delivering hands-free waterblasting solutions and training to industrial cleaning contractors. As part of the initiative, Jetstream's experts consult with customers, visiting job sites to identify the right hands-free waterblasting solutions for the location.

"Jetstream and FS Solutions can demo, sell and rent the broadest offering of hands-free cleaning solutions in the industry, including automated and robotic tools and accessories." Varca said.



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Go Beyond the Basics to Keep Your Vacuum Excavator in Peak Winter Condition

By Ben Schmitt, Product Manager, Vactor Manufacturing

In the winter months, when cold weather conditions set in, regular maintenance and a heightened awareness of how to keep vacuum excavation equipment operating properly is required to avoid costly repair expenses. In the oil and gas market alone, there are thousands of vacuum excavators at work in oil fields across North America, and a majority of these units are working through the winter in extremely cold conditions.

As a basic rule of thumb, it's important to follow any winter maintenance recommendations outlined in the operator's manual. These tips will generally include the following:

- Check coolant and use recommended antifreeze/water mixture for the lowest temperature expected during operation.
- Make sure the water heater works properly.
- Use hydraulic oil and lubricants designed for the cold weather.
- Maintain the battery by removing and cleaning cables, cleaning cable ends and posts, and cleaning and tightening the terminals.
- Change fuel filters routinely.

You can also get some helpful advice from the service technicians at



Vactor vacuum excavation trucks are designed to operate in temperatures as low as minus 40°F (minus 40°C).

your equipment dealer. Beyond the basic winter maintenance tips, Vactor Manufacturing offers some additional recommendations to keep your vacuum excavation equipment operating throughout the winter.

Consider cold weather truck options

Make sure equipment is designed to operate in cold temperatures. Vactor vacuum excavation trucks are designed to operate in temperatures as low as minus 40-degrees F (minus 40-degrees C). Vactor Manufacturing offers a number of cold weather options, including heated storage, heated water pump and water heater cabinets, and heated warming cabinets. Vactor vacuum excavators featuring the new Kenworth T880 chassis can be equipped with an arctic package including a block and pan heater, heated fuel water separator, coolant tank heater, battery pad heater and arctic hose options for colder extremes.

Before, during and after the job

- Make sure all water lines are heated and insulated – including the water pump cabinet.
- Allow hydraulic fluid and transmission fluid to warm up before operation.
- Before heading out on the job, check airline hoses for cracking, make sure air dryer is functioning properly to prevent lines from freezing (alcohol can be added to the system to prevent freezing).
- Make sure all lights are operating



Vacuum excavation equipment requires proper, thorough maintenance – especially during the winter – to keep it running smoothly year-round. Winterizing equipment ensures efficient performance and maximum uptime, and protects the investment in the vacuum excavator.

and free of snow, ice or dirt.

- Use a recirculator to circulate water through the water system during transport. Check the recirculator each day to ensure that it is operational.
- Keep tires inflated to the proper pressure rating. Tire pressure decreases over time, especially when winter temperatures fluctuate.
- Regular washing of the truck, especially during the winter, will help prevent buildup of salt and other corrosive material that can cause rust or wear.
- When shutting down for the day, it's essential to drain and purge all water – or run glycol through the line with a glycol injection system to prevent water from freezing. Vactor vacuum excavators feature an air purge option that uses chassis air to blow out the water line at the end of the day.
- Some contractors and municipalities have indoor garages where they can park their vacuum excavators at

(continued on page 12)



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night. For any trucks parked outside overnight or for any extended period of time in the winter, block heaters should be used. The truck chassis can also be spec'd for cold weather options such as:

- Wind front on grill to maintain heat in the cold
- Battery heater
- Fuel line heater
- Arctic package

Visibility is important

For the safety of the operator – and any others on the jobsite, or on the road when traveling to and from the job – good visibility is essential. Keep the windshield wiper fluid tank full with a winter blend to prevent freezing, and install winter weather wiper blades to help keep snow and ice off the windshield.

Proper lighting is also important for enhanced visibility, especially during the winter months when days are shorter and sunlight is minimal. When driving in snow, vacuum excavators and other vehicles can be hard to see, so it's important to include additional DOT lighting on the truck beyond the standard DOT clearance lighting to increase visibility. Additional work lights should be installed on vacuum excavators to enhance visibility to the site when working in the early morning or evening hours and when working in snowy conditions. For added visibility and safety, operators should also wear reflective gear over their clothing.



For added visibility and safety, vacuum excavation operators should wear reflective gear over their clothing.

Stay warm on the job

Human skin begins to freeze when the temperature drops below 32 degrees F (0 degrees C), resulting in frostbite. Exposure to extreme cold can also lead to hypothermia and trench foot. Vactor vacuum excavators feature optional warming boxes to allow operators to warm up in cold weather.

Always be prepared

Depending on the job, a vacuum excavator operator might be working out in the middle of nowhere, with miles and miles between them and the closest town. They might be facing poor mobile phone reception and steadily dropping temperatures, with snow and ice in the forecast. With this scenario in mind, we recommend keeping an emergency survival kit in the truck that includes extra hats, gloves, gaiters and other winter clothing, blankets, food, water, flashlight, batteries, matches, emergency flares and first-aid items.

Vacuum excavators require proper, thorough maintenance – especially during the winter – to run smoothly year-round. Winterizing equipment



Vactor vacuum excavators feature optional warming boxes to allow operators to warm up in cold weather.

– and taking the proper steps before, during and after operating the equipment in winter conditions – ensures efficient performance and maximum uptime and protects your investment.

About Vactor Manufacturing

For more than 100 years, Vactor Manufacturing has provided customers around the world with a wide range of material handling equipment. Today, Vactor is the industry leader in vacuum excavators, sewer and catch basin cleaners and industrial vacuum loaders featuring innovative technology and custom configurable designs. With one of the largest and most developed distributor networks in the industry, Vactor has more than 50 North American distributors in more than 100 locations to serve the municipal market, as well as six factory direct locations through FS Solutions for industrial customers. For more information, visit www.fssolutionsgroup.com.

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New pump unit and accessories highlight NLB's booth #1257

As usual, visitors to the 2015 WWETT show in Indianapolis will find an array of NLB water jet solutions, some being shown for the first time. Highlights include:

- **UltraGreen™ pump unit** – hard-working and convertible, with lower emissions and lower operating costs
- **MiniARM** – adaptable water jet automation that fits through a 30" doorway
- **NLB 286B series lances** – all the features (and pressures) you want, with WJTA color coding
- **Saflex 2001** – portable tube bundle system with a hose reel to enhance jobsites safety

That's not all — we're also featuring a range of convertible pump units and accessories for applications old and new. If you're coming to Indy, we invite you to visit Booth 1257.



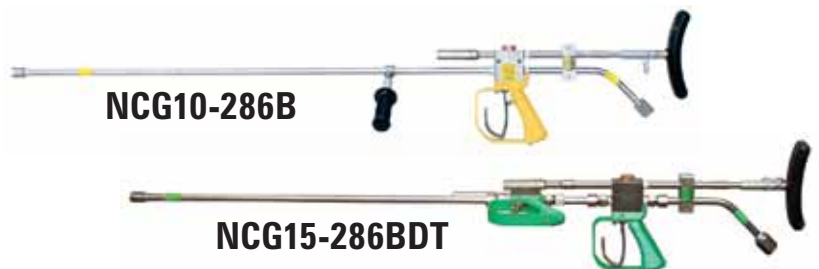
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Hydrodemolition is a Concrete Removal Method for Our Times

“With today’s emphasis on efficiency, cost-effectiveness and health and safety, hydrodemolition provides a concrete removal and refurbishment system for modern working conditions,” said Patrik Andersson, key account manager of Aquajet Systems AB of Sweden in a presentation at the 2014 WJTA-IMCA Expo in New Orleans.

The ear-splitting rattle of jackhammers is still a feature of construction, maintenance and demolition sites, but in recent years the use of hydrodemolition robots has proven to be so remarkably effective that many contractors and public sector organizations are investing in the machines.

Although the time of almost universal use for this sophisticated form of concrete removal is probably some way off, the advantages mean that it is fast gaining ground. Advances in automatic robotic technology mean that this equipment can now cope with almost 95% of all concrete repair tasks without any modifications.

One thing that is common among all types of concrete construction is the need for maintenance and refurbishment,

and all are in need of repair 15 to 25 years into their lifecycle. At some point the owner of the structure is going to have to implement an extensive concrete refurbishment program.

The most common reasons for concrete damage are alkali silica reaction, corrosion from salt or acid rain, physical damage from traffic, the weakening effects of the freeze-thaw cycle, chloride carbonation, and corrosion from steel reinforcement.

There are two main types of repair method: jackhammers and hydrodemolition.

Jackhammers represent a low initial investment, but they are labor intensive and have many disadvantages. A jackhammer can cause damage to the rebar and leave rusted and damaged rebar behind. It is all too easy to remove bad and good concrete alike and to leave an insufficient bonding surface.



Typical heavy concrete damage to an elevated concrete decking.



Badly damaged concrete beams on two bridges in Chile, caused by an earthquake were removed using hydrodemolition techniques. This proved ideal with no collateral damage to the remaining structures.



A basic principle of hydrodemolition is ‘selective removal’ - removing only the amount of concrete needed for the refurbishment and leaving ‘good concrete’ and steel reinforcement undamaged.



Hydrodemolition techniques offer a fast and efficient method of concrete removal, without damaging the surrounding structure and imbedded rebar, utilizing power from high-pressure water.

(continued on page 16)

Comments Solicited on Improvements to Recommended Practices

Comments are solicited regarding improvements to the WJTA-IMCA publications, Recommended Practices for the Use of High Pressure Waterjetting Equipment and Recommended Practices for the Use of Industrial Vacuum Equipment. While both publications are reviewed periodically at the WJTA-IMCA conferences and throughout the year, your comments and suggestions for improving the publications are invited and welcome anytime.

Please address your comments and suggestions to: WJTA-IMCA, 906 Olive Street, Suite 1200, St. Louis, MO 63101-1448, phone: (314)241-1445, fax: (314) 241-1449, email: wjta-imca@wjta.org. Please specify which publication you are commenting on.

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Association Managers

Mark S. Birenbaum, Ph.D.,
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Hydrodemolition is a Concrete Removal Method for Our Times, from page 14

The vibrations can create additional cracks and cause stress to the structure and the operators alike. And it is noisy.

Hand/Arm Vibration Syndrome

Hydrodemolition avoids the medical problem that so often afflicts the operators of jackhammers. Known as Hand-Arm Vibration Syndrome, or HAVS, this is a condition that is caused by working with vibrating tools or machinery. It can lead to considerable pain and time off work and may result in permanent disability.

A related condition is Vibration White Finger, or VWF, used to describe damage to the circulation in the fingers. This leads to spells of numbness in the fingers, which can be both painful and dangerous for the operator.

Hydrodemolition, however, is very much a tool for today's requirements. Among the benefits – selective removal system, no cracking, no dust pollution, a superior bonding surface, and no rebar damage. In fact, this method can be used to clean rebar of dust and concrete. Add to this the faster working speed, the substantial savings on labor, and the quiet operation of the hydrodemolition machine, and it can be seen why this method of concrete removal is steadily becoming more popular.

Health and environmental considerations are among the overriding factors of our time when it comes to construction and demolition.

Hydrodemolition Benefits

Using hydrodemolition benefits both the operator and other site workers, and the people living and working in the vicinity of the site. The hazard of air-born silica dust and other particles is virtually eliminated as the particles are trapped in the runoff water, and injuries caused from the constant vibra-

tions and heavy lifting of the jackhammers are avoided. For the surrounding area the noise of a hydrodemolition robot is minimal, as there is no percussion effect. There is no noise to spread throughout the structure, allowing work to be carried out in sensitive areas such as sites next to hotels, hospitals and residential developments. Not only does this benefit the neighborhood, it allows the contractor the potential of longer working hours in an area that might otherwise restrict the use of jackhammers.

A hydrodemolition robot uses high-pressure water, which is directed at the surface of the concrete where it penetrates the voids and micro-cracks. When the water pressure inside the voids overcomes the pressure of the concrete, a “blast” occurs. This means that a robotic unit can be used to accomplish removal in a controlled manner. Selective removal is one of the basic principles of hydrodemolition. It means you only remove the amount of concrete needed for the refurbishment, leaving the good concrete and the steel reinforcements undamaged.

Improved Bonding

Hydrodemolition also provides a better bonding surface. Jackhammers

tend to leave a flat surface, but the waterjet provides a surface with peaks and valleys that provide grip. Independent tests have proven the bonding to be at least 50 percent higher than that of a surface prepared with jackhammers or sandblasting machines.

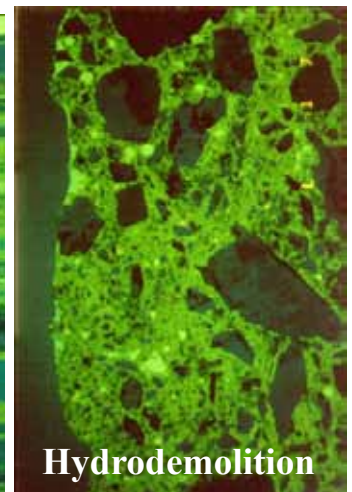
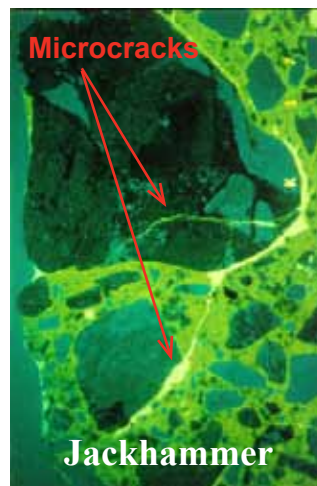
As hydrodemolition is impact-free there is no risk that the area treated will receive any impact or vibration damage. When rebar or other embedded steel is struck by a jackhammer, vibrations will travel deep into the concrete to areas of sound concrete. Micro-fractures and loosening of the rebar is often the result, and this can cause areas of potential future problems once the concrete is replaced.

Aquajet Systems has been in the hydrodemolition business since the early 1980s, continually advancing and improving the technology. In 1998 AquaJet Systems became the first ISO 9001 certified hydrodemolition manufacturer in the world.

“We believe that this technology belongs not only to the future, but to our present-day requirements,” says Andersson.

For more information, visit www.aquajet.se.

Since hydrodemolition is impact free there is no risk that the treated area will receive any vibration damage. Compared with jackhammer techniques in which vibrations travel deep in to the concrete to areas of sound concrete resulting in micro fissures and loosening the rebar. This can create areas of potential future problems once the concrete is replaced.



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Call for Nominations – 2015 WJTA-IMCA Board of Directors

Nominations for the WJTA-IMCA Board of Directors are open. The duties of the directors are truly challenging and rewarding. WJTA-IMCA members are encouraged to get involved in the election process, nominate fellow members for a seat on the board and **VOTE!**

Nominations are sought for six (6) board members who will each be elected to serve a four-year term of office beginning November 1, 2015, and one (1) board member to serve a two-year term of office beginning November 1, 2015. The board member receiving the seventh highest number of votes will serve the two-year term of office.

The terms of office of **Fred D. Clark**, IVS Hydro, Inc.; **Luis Garcia**, Northern Safety & Industrial; **Mohamed Hashish, Ph.D.**, Flow International Corp.; **Kathy Krupp**, The Dow Chemical Company; **Larry Loper**, High Pressure Equipment Company; and **Kerry Siggins**, StoneAge, Inc., will expire on October 31, 2015. The seventh position open for nomination was formerly held by **Forrest Shook**, NLB Corporation. Mr. Shook resigned his board position effective October 12, 2014.

The WJTA-IMCA bylaws provide that no more than one of the elected board members may be from the same company or organization. Therefore, board members may not be nominated from the same company or organization already represented on the board by individuals whose terms expire in 2017, including **HydroChem LLC** (Gary Noto); **Jack Doheny, Inc.** (Kay Doheny); **Vacuum Truck Rentals, LLC** (Bill Gaff); and **Veolia North America** (Bill McClister).

According to the WJTA-IMCA bylaws, any WJTA-IMCA member in

NOMINATIONS/ELECTIONS PROCEDURES – NEW ONLINE VOTING AVAILABLE FOR 2015 ELECTION

In accordance with the bylaws of the WJTA-IMCA, revised in 2002 and 2013, nominations and elections to the Board of Directors include the following procedures:

- At least two calls for nominations to the Board of Directors will be published in the Jet News. The second call for nominations appears in this issue. A call for nominations also appears on the WJTA-IMCA website. Nominations will be accepted through March 31, 2015.
- On August 3, 2015, a list of nominees and a biographical sketch for each individual will be circulated by email to the eligible voting membership with a link to vote online via the WJTA-IMCA website.

In order to vote online, members must have an email address in their membership profile. The email address is also the user name.

Members will be able to login with their unique username and password to fill out a ballot, which will be initialed, signed, and submitted electronically through the website. Members may request a written ballot be mailed to them, which must be signed and returned to the WJTA-IMCA office by mail, fax or email. If a member returns multiple ballots (be they written or electronic), only the first ballot received will be counted. Online ballots and printed ballots must be received by the WJTA-IMCA office for tallying no later than September 21, 2015.

In the event of a tie for a position on the Board, a runoff election between the tied candidates will be conducted using the procedures outlined above over a two-week period following the initial election.

- The names of newly elected board members will be announced on the WJTA-IMCA website and in Jet News.

Only WJTA-IMCA members in good standing (2014 membership dues paid) may submit a nomination(s). A nominee who has not paid her/his 2015 membership dues by March 31, 2015, shall be declared ineligible to run for office in the 2015 election.

good standing (2014 membership dues paid) may submit a nomination(s). A nominee who has not paid her/his 2015 membership dues by **March 31, 2015**, shall be declared ineligible to run for office in the 2015 election. The deadline for making nominations is **March 31, 2015. Your nomination(s) should reach the WJTA-IMCA office no later than March 31, 2015.**

To submit a nomination(s), complete the Nomination Form and return, along with a biographical sketch and a statement of your nom-

inee's mission and vision for WJTA-IMCA, to: WJTA-IMCA, 906 Olive Street, Suite 1200, St. Louis, MO 63101-1448.

Remember, nominations must be submitted to the WJTA-IMCA office **NO LATER THAN MARCH 31, 2015. Nominations must be accompanied by a bio and mission and vision statement.**

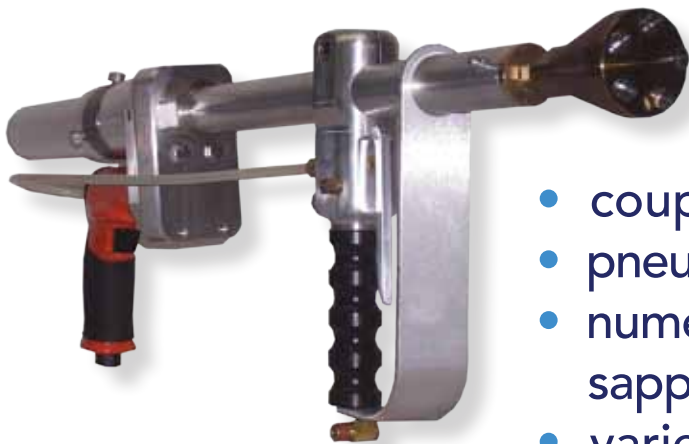
**See Nomination Form
on page 26**



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Camera System Option for Guzzler® High-Rail Vacuum Loader

Guzzler Manufacturing has introduced a camera system as an option for the Guzzler® High-Rail industrial vacuum loader. The three-camera system provides the operator with enhanced visibility to the operator location while the unit is vacuuming on railroad tracks and in switchyards.

“When operating with the rear-mounted controls on the vacuum loader on rails or in switch yards – especially in response to hazardous railroad spills or emergency situations – it can be difficult to see personnel or other rail-mounted vehicles on adjacent tracks,” says Ben Schmitt, product manager at Guzzler Manufacturing. “The Guzzler High Rail camera system significantly reduces blind spots for the operator during railway applications and increases safety by providing greater visibility to the overall surroundings, including oncoming personnel or traffic.”

The optional camera system includes a seven-inch, weather-proof LCD monitor and cameras

mounted on the front and sides of the vacuum truck to provide a wide-area, real-time view of the Guzzler High-Rail loader surroundings, even during extreme weather conditions. The operator can easily monitor the view from each camera on the LCD screen simultaneously.

“Guzzler Manufacturing has been building and improving industrial vacuum equipment for more than 40 years,” Schmitt says. “We are committed to providing our railroad and rail contractor customers with solutions that result in the safe and efficient loading, offloading and transport of materials. The optional camera system on the Guzzler High-Rail vacuum loader delivers greater situational awareness, improving workplace safety, performance and productivity.”

Guzzler products, including the Guzzler High-Rail industrial vacuum loader, are serviced at 11 FS Solutions locations across the United States. For more information, visit www.guzzler.com or call (800)627-3171.



Mounted on the front and sides of the Guzzler High-Rail vacuum loader, the optional camera system provides a wide-area, real-time view of the surroundings while the unit is vacuuming on railroad tracks and in switchyards.



Featuring a loading boom, hydrostatic creep drive and a rear-mounted operator chair, the Guzzler High-Rail loader uses vacuum power to quickly and efficiently remove ballast, contaminated materials and spills from railroad track beds.

PSC Industrial Holdings Corp. Acquired by Littlejohn & Co.

Littlejohn & Co., LLC, has announced the acquisition of PSC Industrial Holdings Corp. from Lindsay Goldberg LLC.

PSC is a leading national provider of maintenance services to critical energy infrastructure that was founded in 1977 and is headquartered in Houston, Texas. Since its founding, PSC has grown from a niche commodity industrial services company into a leading national provider of specialty

maintenance services and technology solutions to the downstream, utility, power generation, upstream and midstream markets. With over 2,000 employees and 90 locations across the country, PSC has the operational size and geographic breadth to service clients regardless of size or location.

Michael Kaplan, managing director of Littlejohn & Co., says, “Under the leadership of Brad Clark and his management team, PSC has been

transformed into a leading value-added service provider to the domestic energy industry. We look forward to further building its service offering and geographic reach.”

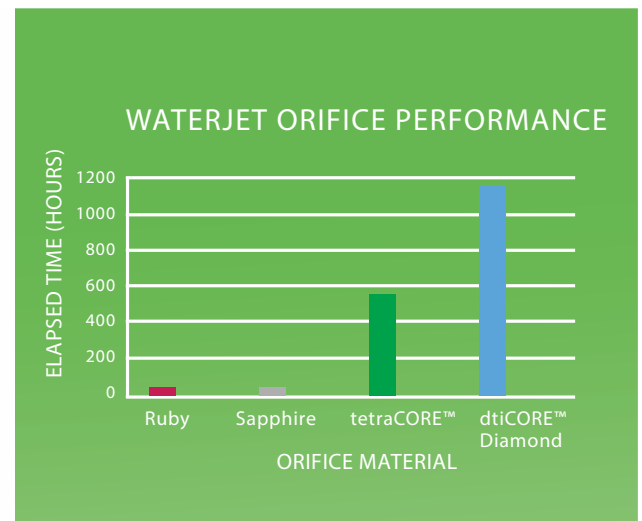
Brad Clark, chief executive officer of PSC, says, “We are very excited to partner with Littlejohn & Co., whose successful track record of growing businesses with similar attributes will help us continue PSC’s transformation into the industry leader in safety, technology and service to our customers.”



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Safety Corner – Respiratory Protection Round-Up

Air quality is among the most precious of safety concerns on a work site. Respiratory hazards, including oxygen-deficient atmospheres and airborne contaminants like dusts, mists, gases and fumes, pose a great threat to workers. The threats can lead to injuries, illness, lost work time and more. When protection is required, employers must provide NIOSH-certified respirators to their workers.

Respirators are an effective defense against these dusts, mists, gases and fumes, and protect workers by filtering hazardous particles from the air, purifying the air, or supplying clean air from an outside source. Since they provide such a vital function, they're one of the most important pieces of a worker's personal protective equipment.



N95 Respirator

Selecting the proper respirator requires an assessment by experienced, qualified safety personnel of all the workplace operations or environments that may create a respiratory hazard.

Respirators fall into the following categories:



Air Purifying Respirator

Particulate Respirators protect only against dust, particles, fumes, and mists. They don't protect against chemicals, gases, or vapors, and therefore, are to be used for low hazard conditions only. Generally, these respirators are disposable masks or they incorporate the use of disposable filters.



Powered Air Purifying Respirator

Chemical Cartridge/Gas Mask Respirators filter or clean chemical gases out of the air as the wearer breathes. Also known as air-purifying respirators, they are comprised of a facepiece or mask, and a cartridge or canister.

There are numerous cartridges and canisters to choose from; therefore, it's imperative to know what hazards exist. These respirators can also utilize filters to remove particles. It's important to note that while there are cartridges, canisters, and filters that protect against more than



By Luis Garcia, President, Gulf Coast Region, Northern Safety & Industrial, and a member of the WJTA-IMCA Board of Directors.

one hazard, there isn't one that protects against all hazards.

Powered Air-Purifying Respirator (PAPR) uses a fan to draw air in to the wearer through a filter, and thus, are easier to breathe through. They rely on a battery for power, and use the same types of cartridges, canisters, and filters as Chemical Cartridge/Gas Mask Respirators.

Self-Contained Breathing Apparatus (SCBA) provides the highest level of respiratory protection and protects against higher concentrations of dangerous chemicals by



Self-Contained Breathing Apparatus

utilizing a tank to supply clean air to the user, so filters, cartridges, and canisters aren't necessary. These units are very heavy, weighing thirty pounds or more. The air tanks generally last an hour or less, depending on their individual rating and the breathing rate of the user. These respirators also require more specialized training on their use and maintenance.

For some intricately hazardous applications, personal protective equipment isn't limited to a respirator. A totally encapsulated chemical protective suit may be utilized to protect a worker from direct contact with potentially hazardous gaseous or liquid chemicals. These suits are full body garments that cover the head, torso, arms, legs, and respirator. They may also have built-in gloves and boots; or alternatively, gloves and boots will be tightly attached to the suit.

Getting a Good Fit

Using a respirator that fits properly is also imperative to worker safety. A fit test tests the seal between a tight-fitting respirator's facepiece and the worker's face, and is performed at least annually. This testing determines the best make, model, style, and size of respirator for each worker.

In addition, a user seal test, a quick check performed by the wearer each time the respirator is put on, must be performed. This test determines if the respirator is properly sealed to the face or needs to be readjusted.

(continued on page 24)

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www.peinemannequipment.com


PEINEMANN
EQUIPMENT

Safety Corner – Respiratory Protection Round-Up, from page 22

It's important to note that anything that comes between the respirator's seal and the worker's face can allow contaminated air to leak into the facepiece and disrupt the protection. Facial hair, like a beard or mustache, or straying long hair impacts the effectiveness of a respirator.

Choosing the right respiratory protection keeps workers safer, minimizes injuries, and increases comfort and productivity. If you have questions about which type of respirator is right for your job, please give the Technical Support Reps at Northern Safety a call at 800-922-8553. They'll give you the information you need to make the right choice for you and your co-workers.

SPIR STAR Announces Personnel Changes

SPIR STAR Ltd. has announced the promotion of Elizabeth Simmons, formerly assistant accounting manager, to accounting manager. Mrs. Simmons joined the SPIR STAR team in 2008. As the accounting manager, Mrs. Simmons will oversee the Accounting Department and be responsible for all accounts payables and receivables.



Elizabeth Simmons

Kristen Sydness has been promoted to human resources manager. Mrs. Sydness joined SPIR STAR in 2007, working as the sales and human resources administrative assistant. As the human resources manager, Mrs. Sydness will be responsible for the development and on-going management of the company's human resources function.



Kristen Sydness

The promotions were effective in January 2015.

Located in Houston, Texas, SPIR STAR manufactures high pressure thermoplastic hose. For more information, visit www.spirstar.com.

WJTA-IMCA Asks for Your Incident Reports

New Safety Initiative Provides Real World Topics to Share with Your Team

In the previous *Jet News*, we shared two brief incident reports that could serve as safety meeting topics and be shared with your employees, colleagues, or customers.

Without question, safety must be at the forefront of every supervisor's and worker's focus. It is for this reason that we wish to provide our membership with real situations and incidents that have occurred as well as corrective actions to prevent reoccurrence.

In order to continue providing this resource to the industry, we are asking for your help. Submit reports on past or present incidents and near misses anonymously with the quick web form on WJTA-IMCA's website at ow.ly/HHdgL or click "Incident Reporting Form" under the "Resources" menu at www.wjta.org. You can also

email reports to wjta-imca@wjta.org. Any potentially identifying information will be removed from the reports prior to publication in the *Jet News* and website.

Workplace safety requires constant vigilance, and even situations that seem basic to industry veterans can provide important instruction for new workers and field personnel.

Submissions could include incidents/near misses from the field, or even reports from equipment manufacturers, distributors, and rental companies about inappropriate modifications or applications of equipment, creating hazardous situations.

For more information on this initiative, contact Peter Wright in the WJTA-IMCA office by phone: 314-241-1445 or email: wjta-imca@wjta.org.

IMPORTANT NOTICE REGARDING SPAM

Email addresses and other member contact information published in the WJTA-IMCA Membership Directory are meant to encourage helpful, informative communication between members. The information is not provided to circulate spam or junk mail.

The WJTA-IMCA leadership requests that members respect the contact information of fellow members and not use that information for the dissemination of spam or junk email. Membership information is not meant to be circulated beyond the WJTA-IMCA membership.



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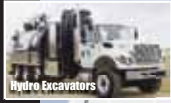
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WJTA-IMCA Board of Directors Nomination Form

Name of Nominee _____
Company _____ Title _____
Address _____
City _____ State _____
Country _____ Postal Code _____
Telephone _____ Fax _____
Email _____

Attach biographical information with a brief statement of your nominee's mission and vision for WJTA-IMCA.

Name of Nominator _____
Company _____ Title _____
Address _____
City _____ State _____
Country _____ Postal Code _____
Telephone _____ Fax _____
Email _____

Return completed Nomination Form and supporting information to: WJTA-IMCA, 906 Olive Street, Suite 1200, St. Louis, MO 63101-1448.

Flow Waterjet Technology for Cutting Neolith

Flow International Corporation and TheSize, manufacturer of Neolith, have announced that Flow waterjet technology is the ideal cutting method of Neolith surfaces for indoor or outdoor use.

Neolith is tough sintered surface which requires powerful, versatile methods for cutting and processing. Often used for countertops, Neolith is also used as flooring, cladding and facades. "Flow's technology is truly invaluable to Neolith," says Daniel Sanchez, sales manager for TheSize. "The delicate precision and easy-to-handle machinery ensure that our fabricators have a positive experience with the product."

While Neolith can be fabricated using a variety of different methods, Flow waterjet systems offer the unique advantage of maneuverability; providing an easy way to create sink holes, faucet

holes, and even ornate details. With Flow waterjet technology it is possible to easily cut countertop and detailed design elements at the same time.

The Neolith brand, manufactured by Spanish company TheSize, is the outcome of the latest research and development processes in the industry. The product is 100 percent natural, composed of raw materials – clays, feldspar, silica and natural mineral oxides – and is recyclable. Neolith has near-zero porosity, making the product hygienic, stain resistant, easy to clean and impervious to chemicals. The product is also wear, scratch, heat resistant and its colors, because they are all-natural, do not vary when exposed to UV rays. Additionally, the product is lightweight and easy to install, making Neolith suitable for virtually every indoor and outdoor home surface.

For more information, visit www.FlowWaterjet.com.



A sample of Neolith material cut by a Flow waterjet.



Neolith material being cut with Dynamic XD on a Flow Mach 3 waterjet.

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OMAX® Expands MAXIEM® Line

OMAX Corporation introduced three larger sizes of its next generation MAXIEM to meet the needs of shops, OEMs, metal service centers and fabricators for large-scale production.

The first five models in the next generation MAXIEM JetMachining Center product line were introduced in April 2014. The lineup now comprises eight models including the new 2060, 2080 and 3060 JetMachining Centers.

The 2060 and 2080 models are ideal for a wide range of modern large

format machining of parts up to 6 feet, 7 inches wide x 20 feet, 6 inches long and 27 feet, 2 inches long, respectively. The 3060 JetMachining Center boasts a wider work envelope ideal for machining of a wide range of materials and thicknesses, from metals and composites to glass and plastics. This machine features a Y cutting travel of 10 feet, 2 inches, more than three and a half feet wider than the 2060, and an X cutting travel of 20 feet, 6 inches.

The complete MAXIEM lineup continues the tradition of easy-to-use, reliable and efficient abrasive waterjet

machines designed and built in the United States. These JetMachining Centers also feature OMAX's industry leading Intelli-TRAX® linear drive system that utilizes brushless servo motors, integrated servo drives and high precision linear encoders that provide constant and continuous feedback on the actual position of the cutting head. In addition to increased part cutting accuracy, the advanced drive system delivers much faster and smoother motion.

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MAXIEM® 2080 JetMachining Center

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- Articles about new and innovative applications and equipment
- Articles related to total quality management, management trends, marketing, state and federal legislative and regulatory issues, and safety issues
- Articles specific to any specialty area
- Career and student focused features

Jet News also welcomes letters to the editor.

Preparing the Manuscript

Articles should be approximately 1,000-1,500 words long and submitted via email as a Word document. Illustrations, photographs, graphics and charts are encouraged to complement the article. All accompanying materials should be labeled to provide appropriate originator credit. Suggested captions are required.

Degrees and accreditations, professional titles and current position should be included. All statements based on published findings should be referenced appropriately. References should be listed numerically within the text and at the end of the article. Articles not meeting submission criteria may be returned for reformatting at the editor's discretion.

Send submissions to wjta-imca@wjta.org, attention: George A. Savanick, Ph.D.

Hydrostatic Testing Units for Oil and Gas Market

Jetstream of Houston, LLP, has introduced the HydroForce™ Series hydrostatic testing units – the HydroForce 3000, HydroForce 3600 and HydroForce 4200 – for accurate blow out preventer (BOP), pipeline and wellhead testing.

“The Jetstream HydroForce Series units are tough under pressure and built to meet the exploration, drilling and production needs of the oil and gas market,” says Anthony Washington, product manager at Jetstream. “Backed by our strong parts and service support in locations convenient to jobsites, the HydroForce units are the oil and gas contractors’ choice for reliable, high-performance hydrostatic testing equipment.”

Engineered for accuracy under the most challenging conditions, HydroForce units are mounted on a heavy-duty skid or trailer unit with integrated fluid containment and feature the Jetstream Hydrostatic Test Valve (HTV), high-capacity water tanks, 50-gallon fuel tanks, a choice of 80 to 325 hp John Deere or Cummins Tier 3 or Tier 4 diesel engines, and pressures from 6K to 20K, with flows from 6 to 60 gpm.

An invaluable accessory that complements the HydroForce Series, the Jetstream HTV delivers outstanding control under varying test pressures. Pressures can be varied up to 20,000 psi with the precise hand-adjustable pressure-setting fill lever. An exclusive, heavy-duty internal check valve automatically holds downstream pressure when the lever is released, which eliminates the need for an external foot gun.

“Operators working in harsh and demanding environments will appreciate the HTV’s improved control, produc-

tivity, safety and durability features,” Washington says. “The Jetstream HTV allows an operator to easily control the test pressure without ‘feathering’ the clutch, boosting productivity and extending clutch life.”

Multiple auxiliary outlet ports allow the use of a chart recorder for data collection purposes. Operators can depressurize with only a quarter turn on the bypass valve.

Cartridge replacement on the HydroForce Series units is fast and easy, allowing work to continue with minimal interruption. On other hydrostatic testing units, when maintenance is required, such as fixing a faulty or stuck valve, the entire system must be disassembled and a new valve inserted, which causes considerable downtime. With the Jetstream 20,000 psi cartridge-style check valve, the operator can be up and running in a fraction of that time.

“When configuring the plumbing to perform a hydrostatic test, check valves have typically been placed in the middle of the system, making access difficult,” Washington says. “With the Jetstream HydroForce Series,

there’s no need to send out for repair or wait for replacements.”

HydroForce units are also equipped with the versatile Jetstream UNx® System that allows contractors to perform work at a variety of operating pressures to meet the needs of the oil and gas market. Designed for fast conversion from 5,000 to 40,000 psi operating pressures, Jetstream UNx pumps have enabled contractors to perform pump maintenance in the field quickly and efficiently, without compromising durability.

Personal training through the Jetstream RightStart program is available with the purchase of a Jetstream HydroForce Series hydrostatic test unit. “The hands-on training provided by our RightStart technicians will educate operators on the safe, proper and efficient use of their new hydrostatic testing equipment,” Washington says.

For more information on the new Jetstream HydroForce Series hydrostatic test units, visit www.waterblast.com or call 1-800-231-8192.



Copper Mine in the Democratic Republic of Congo Installs Waterjet Cutting System

Waterjet manufacturer Jet Edge, Inc. and its Africa representative Jetstream Cutting Solutions CC announced that operators of a remote copper mine in the Democratic Republic of Congo (DRC) are planning to double the mine's productivity with the help of a new Jet Edge Edge X-5® 5-axis waterjet.

The DRC mine operation, which is at least a three week's drive from Johannesburg, South Africa, plans to use the Jet Edge waterjet system to speed up the completion of a copper processing plant. The Jet Edge machine is the mine's second waterjet system. In 2012, the company installed a new Jetstream 3-axis waterjet, powered by a 90,000 psi (6200 bar) 50 hp Jet Edge X-stream xP90-50 hydraulic intensifier pump.

"They run their first machine 24/7," says Jetstream Cutting Solutions Director Malcolm Cruickshank. "The Jet Edge X-Stream pump was key to the success of the first machine because they could utilize the higher pressure to increase productivity."

For their second waterjet system, the mine operators selected Jet Edge's 90,000 psi (6200 bar) EDGE X-5 system with dual independently programmable 5-axis cutting heads and laser plate mapping system, Aquavision Di industrial PC controller, and 5-axis waterjet cutting software.

Cruickshank notes that the mine officials chose a Jet Edge system for their second machine based on the reliability of their first Jet Edge pump, and Jet Edge's ability to quickly supply spare parts when needed.

"Reliability is very important to them due to the remoteness of the mine," he says. "They appreciate the speed with which Jet Edge can supply spares."

Jake Hall, a Jetstream subcontractor and director of Mobile Digital Solutions of Sylvania, Australia, oversaw the installation of the Jet Edge system and trained the mine's waterjet operators how to use the new 5-axis machine.

"The EDGE X-5 is a good system," Hall notes. "It's intuitive and easy to operate. I've seen lots of systems in my 11 years working with waterjets, and it seems to do the job very well and is easy to teach. The Aquavision Di controller is extremely reliable. The software is great. It solves a lot of the problems of other CAD/CAM software. It's been specifically designed with waterjetting in mind. Lead ins and outs are easy and it's easy to nest multiple parts. Most importantly, you're not stuck to a certain order. With some software, if you miss one step, you have to start all over again. Jet Edge's software is flexible and it's not labor intensive. The library of materials is good and the speed control is good."



Jet Edge's EDGE X-5 5-axis waterjet cuts precise 3D parts from virtually any material.



The Jet Edge EDGE X-5 work envelope can accommodate very large plates.



Jetstream Cutting Solutions Director Malcolm Cruickshank (right) and subcontractor Jake Hall.

For more information, visit www.jetedge.com or call (763)497-8726.

Photographs courtesy of Jetstream Cutting Solutions CC.

Unique SAE Adaptor Housing

For OEMs and end users installing new bareshaft pumps, Hughes Pumps' unique SAE adaptor housing allows the company's pumps to be flange mounted to a diesel engine flywheel housing ensuring extremely compact, perfectly aligned installations with all moving parts enclosed.

Hughes Pumps use an integral gearbox as standard. This arrangement is far more efficient than a belt drive and is maintenance free. It also increases the mechanical efficiency of the pump, meaning more power is delivered at the water-jetting nozzle.

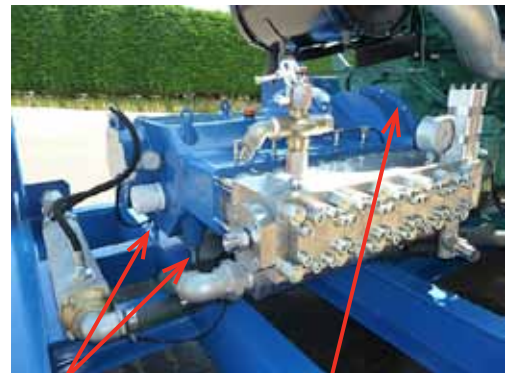
What sets the design of Hughes' pumps apart from others is that it can be fitted with an SAE engine adaptor, which enables the pump and gearbox to be directly flange mounted to the engine flywheel housing, much like a manual PTO or automotive gearbox.

Perfect alignment between the pump and engine prevents gearbox wear/failure often associated with the misalignment of foot-mounted pumps – flexible drive couplings can only tolerate a small degree of misalignment.

The drive coupling and all moving parts are enclosed. No additional guards are required, making any installation very compact and easily completed within minutes. The skid base is not subjected to any torsion, which allows the skid construction to be compact and lightweight.

Hughes' bareshaft pumps can be supplied virtually "plug & play." All engines are fitted with industry standard SAE flywheel housings, in sizes from SAE 5 for 30 kW/40 hp up to SAE 1 for 375 kW/500 hp.

For more information, visit www.hughes-pumps.co.uk, call +44(0)1903892358 or email: sales@hughes-pumps.co.uk.



Supported with two studs SAE engine adaptor

Hughes Pumps' HPS5000 pump, flange mounted to a diesel engine. Only two small support studs are used between the skid base and pump. On pumps up to 75 kW/100 hp, no additional support is required as the pump simply "hangs" from the engine.



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Hughes Pumps' flange mounting option makes the pumps very simple to install and more compact than other like-for-like units, but still powerful enough for the most arduous water-jetting applications. Pumps available in 10K, 20K and 40K PSI.

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HPS650

**2015 WJTA-IMCA
Conference and Expo**
Preliminary Schedule of Events

Monday, November 2

8:00 a.m.-4:30 p.m. – Pre-conference Short Course - Basics and Beyond

Tuesday, November 3

8:00 a.m.-10:30 a.m. – Live Demonstrations

10:30 a.m.-5:00 p.m. – Exhibit Hall Open

10:30 a.m.-3:00 p.m. – Boot Camp

Time to be announced – Research Papers and Case Studies

3:00 p.m.-5:00 p.m. – Reception and Awards Ceremony in Exhibit Hall



Wednesday, November 4

8:00 a.m.-10:30 a.m. – Live Demonstrations

10:30 a.m.-1:00 p.m. – Exhibit Hall Open

Time to be announced – Research Papers and Case Studies



Jet Edge Nominated for 2015 BOLD Awards

Jet Edge Inc. has been nominated for the 2015 BOLD Awards. Presented by ACG Minnesota, the BOLD Awards celebrate and honor the very best in corporate growth strategies. Jet Edge is among 63 Minnesota businesses nominated for the awards. Winners will be announced in February.

Based in St. Michael, Minnesota, Jet Edge manufactures ultra-high pressure waterjet systems for precision cutting, surface preparation and coating removal. Jet Edge waterjets are used by a wide range of industries around the world to cut everything from auto parts and titanium joint implants to food products and diapers.

For more information, visit www.jetedge.com.

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