

# W J T A

Waterjet Technology  
Association



# Jet News

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## Water Cannons



**Fireboat.** (Photograph provided courtesy of Stang Industrial Products.)

*Related article on page 2*

## Water Cannons, from page 1

Figures 1 and 2 show water monitors designed by Stang Industrial Products of Huntington Beach, California. This design relates to hydraulic giants of the type used for moving earth by directing a stream of water under pressure or for fire fighting at a distance such as from a fireboat/tugboat to the upper levels of an oceangoing tanker. (See photograph on page 1.)

The main object of the design is to provide an improved form of directing and handling the tremendous loads of the water stream with as much trajectory reach as possible. The waterway is a single, smooth bored fabricated piping. The configuration provides a water stream unimpeded by

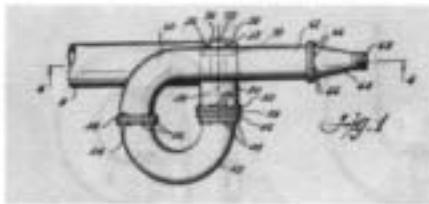


Fig. 1. Big Gun Design by Stang Industrial Products. (Photograph provided courtesy of Stang Industrial Products.)



Fig. 2. Stang Monitor. Furnished with fog nozzle or shaped tip for maximum reach. Used where large amounts of water are needed — 750 to 2,000 gpm. (Photograph provided courtesy of Stang Industrial Products.)



Firefighting at long stand-off distance. (Photograph provided courtesy of Stang Industrial Products.)

structural braces or casting nuances which cause turbulence in the water flow. In addition, the nozzle can be freely moved in both vertical and horizontal planes through the use of swivel joints. The reaction loads are minimal due to the directional configuration of the waterways. No reaction exists in the horizontal plane with minimal reaction in the vertical plane. Some counterbalance is achieved by extension of the nozzle forward of the axis of pivotal movement taking advantage of the weight of the forwardly extended nozzle and the column of water therein. This also provides a more solid and compact and less dispersed discharge of water. The effectiveness of the water is greatly enhanced through increased efficiency.

When fighting a large fire on a vessel, the radiant heat can become a serious problem and the use of a fog/straight stream nozzle becomes required. The nozzle is adjusted to provide a large fog of heavy droplets to cool the environment enough to resume the fire fighting.

Some years ago Stang was commissioned by the U.S. Government to make a large enough monitor and nozzle combination to be powerful enough to shoot a column of water at a burning aircraft (creating danger on board) and shove it over the side of an aircraft carrier. That's water power!

(Additional photographs found on page 18 and page 21.)

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## Jet Edge's New Facility



Jet Edge's new facility in St. Michael, Minnesota, 30 miles northwest of Minneapolis.

After successfully operating for 14 years near downtown Minneapolis, Jet Edge purchased 46 acres of land in St. Michael, Minnesota, and finished construction of a new 100,000-square-foot office and production facility.

Jet Edge President Jude Lague said, "The new facility will provide Jet Edge with the space to sustain our continuing growth in the waterjet industry and will provide our customers with superior training facilities, a product showroom, and state-of-the-art research and development."

Jet Edge designs, manufactures, and sells ultra-high pressure waterjet cutting and cleaning systems throughout the world. Jet Edge builds the complete waterjet turnkey system providing total system quality to the customer.

Jet Edge markets its precision and mobile line primarily through direct sales in North America. An extensive network of established distributors provides sales and services to additional markets worldwide.

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## Butterworth Changes Name

**B**utterworth Jetting Systems, Inc., a leading manufacturer of waterjetting equipment and plunger pumps, has changed its name to Gardner Denver Water Jetting Systems, Inc. This announcement follows Butterworth's acquisition by Gardner Denver in April of this year.



"As much as our products compliment each other, the name change was a natural step in Butterworth's growth as a leader in this market," Dr. Mike Woodward, Director of Plant Operations, said.

The association with such a respected player in the pump, compressor and blower markets can only further our success in the waterjetting industry. In fact, because of our partnership with other Gardner Denver Divisions, we can now offer customers water-jetting units up to 2,000 hp."

Gardner Denver is a leading manufacturer of reciprocating, rotary and vane compressors and blowers for various industrial applications and pumps used in the petroleum and industrial markets. Gardner Denver Water Jetting Systems Inc. manufactures waterjetting machines to 36,000 psi (2500 bar), custom systems, triplex and quintuplex pumps, and a complete line of accessories. Gardner Denver customers include contractors and industrial end users worldwide. For more information, contact Gardner Denver Water Jetting Systems Inc. at 800-231-3628 ext. 410 or via the internet at [www.waterjetting.com](http://www.waterjetting.com).



*A Sign of Quality.*



*A Sign of Greater Things to Come.*

Changes are on the horizon at Butterworth Jetting Systems. Changes that will help you compete...help you lead the market. And that's just the beginning.

Joining the Gardner Denver family in April, Butterworth has completed the unification process by changing its name to **Gardner Denver Water Jetting Systems Inc.** Still offering the durable units and accessories you come to expect, we are now able to offer greater power and flexibility with our product line. Things like water-jetting units up to 2000 horsepower, a wider range of pumps, in-stock units, and lease options.

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## NLB Names Midwest Sales Representative

**R**andy Couture has been appointed a sales representative for the midwestern United States by NLB Corp. He will serve industrial customers in Ohio, Indiana, Illinois, Kentucky, and Wisconsin from NLB's headquarters in Wixom, Michigan.

Couture brings to NLB 27 years of industrial automation experience, including assembly, handling and special process equipment. His management background includes position in sales, engineering and operations. He attended the University of Michigan.

# Waterjets For Explosive Ordnance Disposal In Kosovo

**A**fter extensive trials, the British Ministry of Defense has selected the Excalibur 1 Slurry Jet Cutting System for the Explosive Ordnance Disposal cleanup problems being experienced in Kosovo.

Five complete systems have been ordered and will be in service in January 2000 with British armed forces personnel.

The exhaustive trials performed by the Defense Evaluation and Research Agency and service personnel proved conclusively that Excalibur 1, produced by Alba Industries GmbH of Lübeck, Germany, was the tool for the job. Even at distances of 500 meters from the target, Excalibur 1 was precisely controllable and selectively accessed many differing types of live ordnance so that they could be disposed of safely.

The system has a single approach capability, meaning that the bomb disposal officer only approaches the target once in order to set up the multi-flexible manipulation and check the position of the cutting nozzle. Once this is done and the bomb disposal officer is satisfied, the Explosive Ordnance Disposal engineers then retire to the operational position and start up the system which is operated remotely.

There is no need to approach the ordnance again to provide an access as all linear and circular cutting paths can be controlled at the operator station.

This single approach capability alone makes Excalibur 1 an extremely safe and highly effective Explosive Ordnance Disposal tool. It is easily operated, has its own power unit and operates for up to 20 minutes without having to refill. The manipulation control is so precise that once set it maintains cutting speeds without constant monitoring in all weather conditions.

Actual cutting speed changes are done by the simple turn of a knob on the control panel. Even directional changes are at the flick of a switch.

Excalibur 1 represents a significant step forward in the safe disposal of ordnance and ALBA Industries is proud to be able to announce this order.

Alba plans to manufacture this equipment in the United States beginning in March 2000 and also plans to open an office in Houston.

For further information, contact in the United States Ron Hackler, Alba Industries USA Inc., PO Box 22599, Honolulu, Hawaii 96823, phone: (808) 955-4082, or in Germany contact H.H. Alba, Alba Industries GmbH, Hinter den Kirschkatzen 32, D-23560 Lübeck, Germany, phone: [49](451)582-0454, fax: [49](451)582-0459.

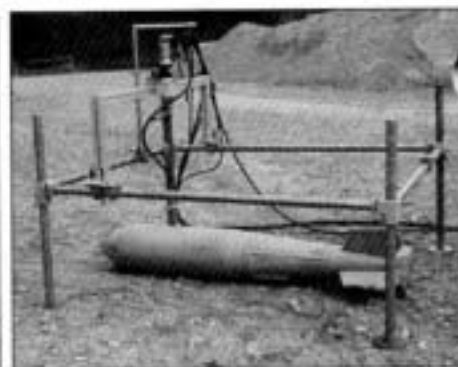
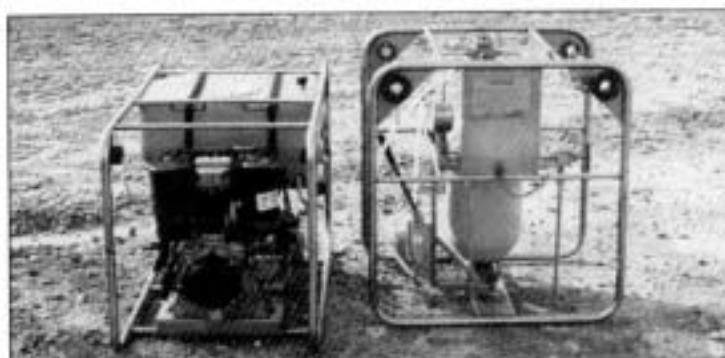


Table ready for a hole cut.



Table and nozzle in cutting operation on an inert projectile.



Abrasive mixing unit with pump unit.



Excalibur 1 in operation.



# Conjet Tunnel Repair Robot Debuts In Italy

Conjet's new compact Robot 302 hydrodemolition machine, developed for use in small tunnels, bridge deck boxes and other similar confined spaces, has exceeded expectations on its debut contract removing the concrete lining from a water supply tunnel feeding the Centrale Grossotto hydro-electric power station in northern Italy. The simple and easy to use Robot 302, rapidly developed by Conjet in close co-operation with the major Swiss hydrodemolition contractor Wan-Jet, has proved to be between four to five times more productive than a high pressure hand lance. The remotely operated 302 is also much safer to use in the very confined tunnel and produces a far more accurate and uniform surface finish than the results obtained with a hand held waterjetting lance.

"I'm absolutely delighted with the 302, it's so good, easy and safe to use and much more productive than I expected," said Wan-Jet managing director Reinhard Frick. "We are having to remove a minimum 20mm of concrete from the tunnel lining and the Conjet can do this at the rate of about 20-21 m<sup>2</sup>/hour compared with around 4m<sup>2</sup>/hour with a hand lance. The 302 also produces a very accurate and uniform surface finish to the concrete left behind and is much safer and less stressful for the operator to use than a hand lance."

Wan-Jet, in a joint venture with fellow Swiss contractor Hydrodemolizione, is removing about 550m<sup>3</sup> of concrete tunnel lining on its SFrl.1 million renovation sub-contract. The joint venture is working for Vienna Construzioni, main contractor on the approximate 6.4km long tunnel repairs, which have been designed by consulting engineers Lombardi for client and power station owner Azienda Elettrica Municipale Milano.

Water is channeled from the River Adda into the concrete lined tunnel, which, with a very shallow 0.007% gradient, closely follows the hillside contour of the Valtellina Valley above Sondrio near to the Italian Swiss border. The water flows through the lightly meandering tunnel before plunging 250m down a 900mm diameter steel pipeline and into one of the 3MW power station's turbine generators for discharge back into the Adda. The flow rate is 2m<sup>3</sup>/sec. The tunnel is 1.1m square from the intake for about half its length, before a gradual transition into a narrow, 3.5m high elliptical egg shape where it discharges into the power station's steel down pipe.

Wan-Jet is using the crawler mounted Robot 302 to remove concrete from about 12,500m<sup>2</sup> of square section tunnel and just over 11,000m<sup>2</sup> from the egg shape. "Conjet's compact tunnel Robot is ideal for working in these confined areas," said Frick. "The Robot's rubber tracks can be easily adjusted independently to follow the tunnel invert contours, making the maneuverable machine a very stable platform for the rotor cutter. And because the 302 is remotely controlled the operator is well away from the hazardous cutting area."

Wan-Jet's Robot 302 carries a special hydraulically driven rotor complete with four high pressure waterjetting nozzles which deliver water at 2500 bar pressure and flow up to 40 litres/min. Water is fed to the

Robot through a flexible hose from a separate powerpack outside the tunnel. The rotor, spinning between 300 rev/min and 1000 rev/min, is mounted on a rotating and telescoping boom which allows the cutter head to constantly follow the tunnel wall profile and maintain the nozzles' pre-set angle of attack to the concrete. Maximum concrete removal depth with the rotor cutter is 50mm. However, much deeper cuts can be made when fitted with the optional single nozzle mounted on an oscillating cassette and 1m long feed beam.

All functions on the Robot 302 are operated from a remote and separate CCU 176 computer controlled,

electrically powered hydraulic unit, which allows progress of the hydro-demolition process to be safely controlled and monitored

away from the hazardous cutting area. The CCU 176, which can be located more than 50m from the Robot, incorporates an advanced computerised closed loop control, monitoring and display system. This system is extremely flexible and very easy for the operator to use and optimize production. It displays and stores all the relevant parameters and machine performance data, which can be printed or downloaded to a PC for future reference or used in estimating future hydrodemolition projects.



(continued on page 8)

## Conjet Tunnel Repair Robot Debuts In Italy, from page 7

The operator chooses one of several pre-loaded software programs to ensure that only the concrete to a predetermined quality depth is selectively removed in a continuous, uniform and safe operation. Additional programs are available on request to suit customer's individual requirements and the operator can also easily adapt and program the computer on site to match a specific operation or set the computer to memorize and save specific working settings for future use.

Wan-Jet pre-set its 302's computer to selectively remove a minimum 20mm of the old worn out concrete lining. At the end of each shift the mixture of concrete spoil and water is removed from the invert prior to a thorough cleaning and spraying of a new synthetic fibre reinforced concrete coating.

Before Wan-Jet started on site the specialist contractor, based in Weinfelden, worked closely with Conjet to develop the concept for the Robot 302. "We started talking to Conjet to explore the possibility of them making a small Robot for tunnel repairs," said Frick. "Conjet were confident they could build a machine, but it wasn't until we were awarded the Sondrio contract that we gave Conjet an order. They immediately responded to our request and set about designing and building it. Just 10 weeks later we had the 302 in the tunnel removing concrete."

"We worked closely with Wan-Jet and designed the Robot 302 primarily for repairing concrete tunnels as small as 1.5m diameter and other similarly confined spaces," said Conjet president and technical director Carl Strömdahl. "The small, lightweight, water resistant Robot is exceptionally maneuverable and can pass through an 850mm wide opening making it ideal for working in small tunnels, culverts, canals and inside concrete box girder bridge decks."

The versatile Robot can also be used as a very efficient industrial cleaning machine, especially for applications in small spaces and other areas of restricted access. "The 302 is unique, there is nothing else like it on the market," said Frick. "I believe there is consideration potential for this small hydrodemolition machine."

For more information, contact in Sweden Lars-Göran Nilsson or Carl Strömdahl, phone: 46-8-741-3940, fax 46-8-741-3960, email: [conjet@conjet.se](mailto:conjet@conjet.se), internet: [www.conjet.com](http://www.conjet.com) or in the US: Stephen Toms, National Hydro Inc., phone: (517)223-0915, fax: (517)223-9525, email: [toms@ismi.net](mailto:toms@ismi.net)

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# Metal Fabricator Uses Waterjet Cutting To Expand Capabilities

**T**he Metal Fabricating Division of Walton & Company in York, Pennsylvania, was looking to expand its business from strictly a sheet metal shop to a company that could fabricate heavier materials, including granite, marble and graphite. While it still found the efficiency of its heat-based plasma cutting systems valuable for many jobs, the company decided to purchase a waterjet cutting system that enabled them to cut thick materials with higher speed and greater accuracy. They chose a waterjet system from Technicut, Inc. that features Ingersoll-Rand components including intensifiers, nozzles and abrasive metering assemblies. This valuable investment has allowed Walton & Company to significantly expand the markets and industries they serve.

Eighteen months after the purchase of the waterjet system, the company has seen its business expand into areas outside their well-known plasma cutting services...specifically in the areas of unique flooring jobs and architectural glass applications. "Waterjet cutting systems have enabled our business to grow by leaps and bounds," says Robert Koss, precision cutting manager, Walton & Company. "We have found that they are especially valuable for cutting flooring material such as marble, rubber, linoleum and carpet. They also work great when cutting gasket material."

As a result, Koss adds, "The diversity of projects we can now take on has lead us to buy two additional systems in the short time we have been using the innovative waterjet technology."

## Waterjet Technology: A Powerful Force

Two steps are required to produce

the energy to cut materials with a waterjet. First, the intensifier — the heart of a waterjet cutting system — pressurizes water up to 55,000 psi (3,800 bar). The water is then focused through a small precious stone orifice to produce a cutting stream with a velocity 2.5 times the speed of sound.

Although plasma-cutting equipment operates well in thin metal applications, waterjet technology is better suited for three key situations:

- precision cuts
- cutting thick materials
- cutting materials that must not have heat-affected zones such as those found on airplane wings or painted areas on enameled sheets.

"Waterjet technology also eliminates concerns related to curling and peeling on sensitive surfaces," Koss notes.

## Walton and Universal Studios

Walton & Company recently completed an extensive four-month project for Universal Studios in Orlando, FL. The company utilized its waterjet technology to produce logos on the flooring at the theme park's new "Islands of Adventure" exhibit. Waterjet etchings included an intricate figure from Dr. Seuss' "Cat in the Hat®" logo (see Fig. 1), flowers and a flying carpet design.

"The Universal Studios' job is the most unique we've used waterjet for



**Fig. 1. Intricate figure from Dr. Seuss' "Cat in the Hat®" stories is cut in marble with a waterjet cutting system powered by the Ingersoll-Rand Streamline IV intensifier.**

to date," says Koss. "Some parts of the logos are very intricate, which makes the precision cutting capabilities of waterjet perfect for the job."

With most flooring jobs, manufacturers sub-contract the design work to companies like Walton who work closely with the customer to develop custom designs. In Universal Studio's situation, an architect created the geometric drawings which Walton then redrew to accurately correlate it to the cutting process.

## Partnering with Technicut

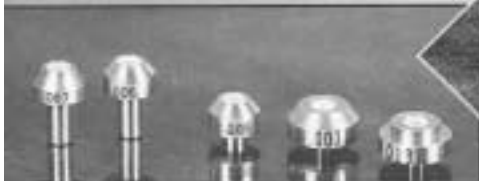
Walton & Company recently began partnering with Technicut to build complete waterjet cutting systems. Technicut incorporates their tables and drive systems with Ingersoll-Rand's powerful Streamline™ SL-IV 50 hp and 100 hp pumps to create complete systems that are marketed and sold by Technicut.

(continued on page 14)

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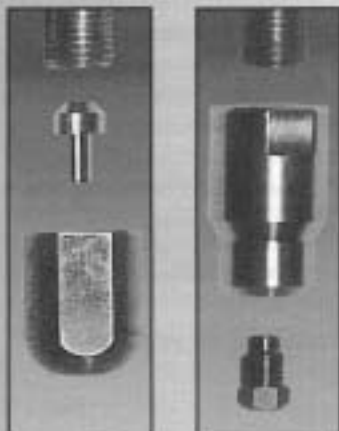
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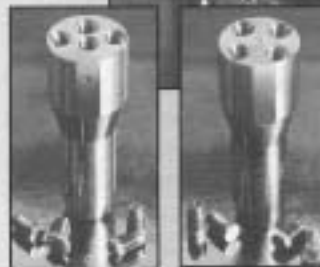
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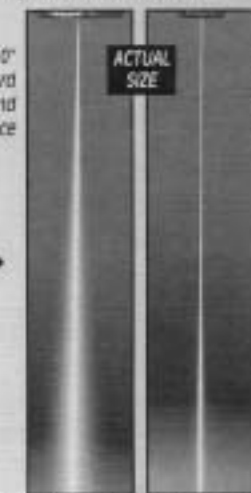
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## HydroChem Acquires LANSO Of Houston, Texas

**H**ydroChem Industrial Services, Inc. has announced that it has acquired Landry Service Co., Inc. (LANSO) for a purchase price of \$35.5 million.

Houston-based LANSO is a leader in providing tank cleaning services, primarily to refineries throughout the United States, and specializes in on-site sludge removal and processing services for above ground storage tanks. The company has 120 employees.

"LANSO and HydroChem share many of the same customers, and LANSO's service offerings complement ours," said Tom Carter,

HydroChem chairman and chief executive officer. "This acquisition will enhance both our companies since it offers LANSO an opportunity to expand its customer base and allows HydroChem to strengthen its tank cleaning services."

HydroChem, also based in Houston, has more than 2,200 employees and offices throughout the U.S. and in Singapore and Puerto Rico. The company provides industrial services, including hydroblasting, chemical cleaning, industrial vacuuming and mechanical services, primarily to the petrochemical, oil refining, electric utility, metals and pulp and paper industries.

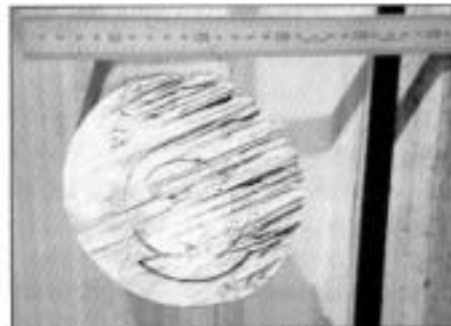
## Waterjets For Explosive Ordnance Disposal In Kosovo, from page 6



Unit in real operation trial by the British Ministry of Defense on the projectile.



Cutting results.



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Mr. Bob Thomson, RMT Industrial Sales, P.O. Box 31, Port Morien, Nova Scotia, Canada B0A 1T0. Tel. (902) 849-9092, Fax (902) 849-6060, writes:

Dear Dr. Howells:

The last three issues of *Jet News* have contained advertisements for ultra-high pressure precision cutting with SUPER-WATER®. This is to point out I still use SUPER-WATER® concentrated industrial water blasting additive for its original purpose of cleaning.

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SUPER-WATER® concentrated industrial water blasting additive is a product of: Berkeley Chemical Research, Inc., P.O. Box 9264, Berkeley, CA 94709. Tel. (510) 526-6272, Fax (510) 525-2375. Website: <http://www.berkchem.qpg.com>



## Hydrodemolition In A Tunnel In Connecticut

A Swedish Conjet Robot 362 hydrodemolition machine has played a vital role in successfully assisting in the unexpected emergency repairs to the damaged concrete cooling water outfall tunnel at the Bridgeport Harbor coal fired power station in Bridgeport, Connecticut, USA. Contractor Jet-Blast Hydrodemolition, working as the specialist hydrodemolition subcontractor for tunnel renovation main contractor Blakeslee Arpaia Chapman, used its Conjet Robot 362 to selectively remove concrete from the top of the square tunnel's exposed walls, prior to replacing with new reinforced wall extensions and tunnel roof slab.

"The Conjet Robot 362 is very reliable, easy to operate and performed exceptionally well. It did everything we expected of it," said Jet-Blast Hydrodemolition US regional manager Jeff White. "It removed the concrete and provided a rough, clean surface to give a good bonding for the new concrete. Hydrodemolition doesn't cause any bruising or micro cracks in the good concrete left behind and leaves all the reinforcement intact and cleaned ready to accept fresh concrete."

Jet-Blast, which has been performing hydrodemolition services throughout North America since 1984, is based in Mississauga, Ontario and South Plainfield, New Jersey. "The Conjet Robot 362 is a very good machine for specialized operations," adds Jeff White. "We've had great success with the 362 and used it on several jobs, including soffits in a parking garage in Nova Scotia, bridge parapet removal and on the Bridgeport Harbor Station outfall tunnel."

The 40 meter (130 feet) long tunnel, running directly under the power

station, channels hot water from the generators for discharge out into the adjacent Bridgeport Harbor. The tunnel, cast insitu on the power station's foundations pile cap, is internally 2.14 meters square (7 feet) with 458mm (18 inch) thick walls and roof slab. During an inspection of the tunnel, just prior to the station's scheduled one month shutdown for routine maintenance, the consulting engineer Spiegel Zamecnic Shah, working for client and power station owner Wisconsin Energy Consortium, found extensive cracking in the reinforced concrete box tunnel. Water pressure during discharge had caused longitudinal cracks at the joints between the upper walls and tunnel crown and needed urgent attention.

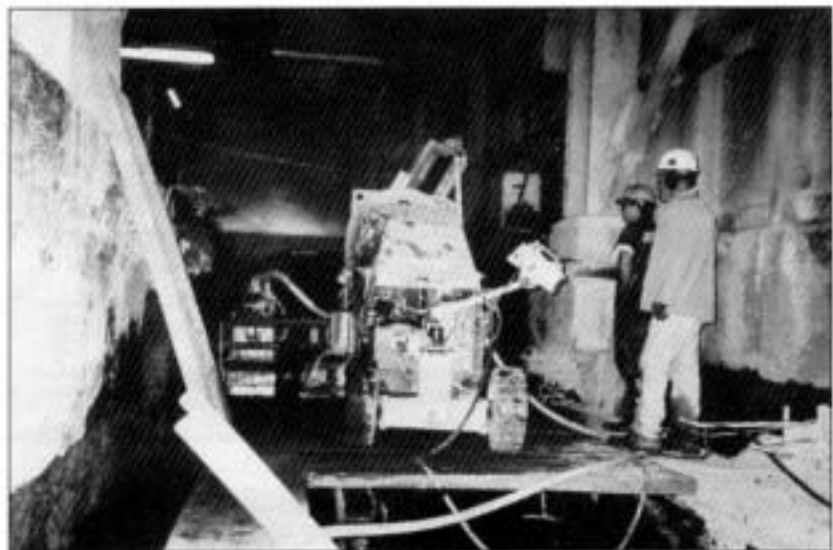
Spiegel Zamecnic Shah quickly designed a repair which involved replacing the roof with a new and stronger slab and chambering the joints between the tunnel crown and walls. The engineer specified hydrodemolition to be used for the emergency repairs and requested the restoration to be done during the power station's routine shut down. Main contractor Blakeslee Arpaia Chapman contacted Jet-Blast

and the company worked out a method, agreed a price and rapidly mobilized its hydrodemolition equipment from Oklahoma, Toronto, and Halifax, Nova Scotia to make an early start on concrete removal.

But before Jet-Blast could put the Conjet Robot 362 to work, Blakeslee Arpaia Chapman first cut out a ground level concrete slab and excavated down two meters to expose the tunnel roof. The general contractor, using circular saws, cut away the roof slab where it joined the tunnel walls and placed working platforms inside the open channel. Jet-Blast followed on behind operating the Robot 362 from the platforms removing the concrete from the tops of the two walls. The Robot 362, fitted with a standard arm, was adjusted so that its feed beam and waterjetting nozzle were slightly angled in such a way to direct water and debris into the tunnel invert for removal later.

Jet-Blast's computer controlled, remotely operated Conjet robot 362 cut the 458 mm wide walls to a depth of

(continued on page 14)



Conjet Robot 362 in operation.

## New Tube Cleaner

**I**drojet, in order to complete the range of hydrojet bundle cleaning equipment, has developed a new rotating rigid lance machine that operates up to 40,000 psi. This equipment has been designed to clean even the dirtiest tubes by means of two rigid lances with a combination of ultra-high pressure water up to 40,000 psi and the rotation of the lances.

The rigid lances boom is connected to a X-Y movement which is hydraulically powered and controlled by remote control joysticks. The power pack is situated far from the operations and all hydraulic hoses are fitted with quick connectors. The Autojet OV2-40PSI differs from other tube lancing equipment because it can be operated in small areas and can be easily moved using a forklift truck, or a small crane.

Idrojet is proud to offer this safe, effective and time saving cleaning machine both in horizontal or in vertical position, for hairpin and floating head bundles.

Idrojet now offers direct sales in the United States and Canada to better serve Idrojet's customers and elevate Idrojet's presence in the market.

For more information, contact La Ferla Fabio, Idrojet S.a.s., Via Luigi Pirandello s.n., Piano Tavola (CT), 95040, Italy, phone [39](095)7131125, fax: [39](095)391466, email: [idrojet@videobank.it](mailto:idrojet@videobank.it) or web site: [www.idrojet.com](http://www.idrojet.com)



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## Hydrodemolition In A Tunnel In Connecticut, from page 12

458mm in just one cutting pass, exposing and leaving behind the forest of cleaned reinforcing bars. Blakeslee Arpaia Chapman followed on behind, placing additional reinforcement in the walls and fixing new for the tunnel roof, prior to casting the new wall tops and 458mm thick roof slab.

In addition Jet-Blast also set the Robot's feed beam on the versatile hydrodemolition machine to make a horizontal cut to remove an approximately 300mm wide by 450 mm high slice of reinforced concrete on one face and at the base of each of four 2.4m square pillars. The Robot 362 was also used, instead of circular saws, to carefully remove the crown of the square tunnel at the intersection with the initial section of precast concrete circular tunnel directly connected to generators' cooling water manifold.

"We worked round the clock, 24 hours a day, for four days to remove the concrete for the general contractor to complete the repair," added Jeff White. Jet-Blast removed about 20 cubic meters of 4,500 psi (320 Mpa) concrete with the Conjet robot 362. "We used a pair of three cylinder Hammelmann pumps operating at a pressure of 1,000 bar and total flow of 95 US gallons per minute (360 liters per minute) with the Robot 362 and were able to remove between 0.8 and 0.9 cubic meters of concrete per operating hour, which is really a very good rate for such deep removal."

After casting the new tunnel roof, the general contractor back-filled the tunnel excavation, replaced the ground floor slab and completed the emergency repairs within the scheduled month long shutdown.

Conjet AB makes and markets a range of remotely operated, computer

controlled Conjet hydrodemolition equipment with cutting widths up to 7m. Conjet equipment can also cut concrete to depths of up to 500 mm and can blast away between 0.5m<sup>3</sup>/h to 1.5m<sup>3</sup>/h, depending on the machine and strength of the concrete.

For more information, contact Stephen Toms, National Hydro Inc.,

5643 Warner Road, Fowlerville, MI 48836, phone: (517)223-0915, fax: (517)223-9525, email: toms@ismi.net or Jeff white, Jet-Blast Hydrodemolition, 250 Mack Place, South Plainfield, NJ 07080, phone: (908)755-1155, fax: (908)755-3993, email: jwhite@jet-blast.com or via the web at [www.jet-blast.com](http://www.jet-blast.com)

## Metal Fabricator Uses Waterjet Cutting To Expand Capabilities, from page 9

The Technicut abrasive waterjet cutting system used for cutting the Universal Studio marble logos is a Model JAS510-5. It consists of a positioning system and abrasive delivery system, the Streamline SL-IV waterjet intensifier and the fully-integrated high-performance N.C. Microproducts CAD/CAM software. There is a 63-inch by 123-inch clear cutting zone table/catcher tank with cutting speed from .1 to 3000 inches per minute. Machine accuracy is +/- .004 inches per axis. System repeatability is +/- .0005 inches per axis.

The Ingersoll-Rand intensifier is a new 100 hp self-contained unit (see Fig. 2) surpasses the performance of its previously most powerful 50 hp unit that has successfully served users of waterjet cutting systems for over fifteen years. Like the 50 hp unit, the 100 hp SL-IV is a plunger pump using variable-displacement, pressure-compensated hydraulic pump technology to convert 3,000 psi of hydraulic pressure to 60,000 psi water pressure and 55,000 psi effective cutting pressure.

When shopping for waterjet parts to build their complete systems, Koss noticed that many other job shops were using Ingersoll-Rand equipment,



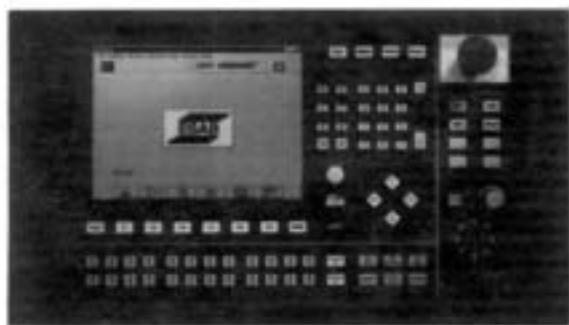
**Fig. 2.** New Ingersoll-Rand Streamline™ SL-IV 100 waterjet intensifier delivers the optimum levels of component reliability and waterjet system uptime.

demonstrating the company's experience in manufacturing waterjet components and systems that now spans over 30 years.

"Ingersoll-Rand's 100 horsepower pump and components are very reliable, requiring only limited maintenance," he says. "Their fittings and valves are designed to fit easily into the Technicut motion system."

For more information, contact Suzanne Perry, Ingersoll-Rand Waterjet Systems, 635 West 12<sup>th</sup> Street, Baxter Springs, KS 66713, phone: (800)826-9274, fax: (316)856-5050.




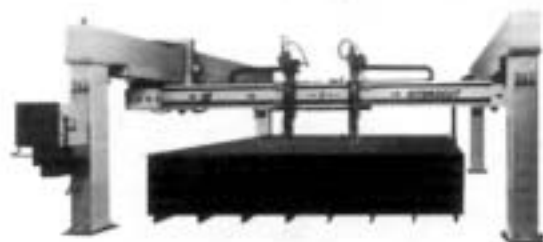


## Reduce Set-Up Time, Eliminate Guesswork

**ESAB Vision Controller with Data Generator automates process parameter programming to enhance repeatability, eliminate the need for special programs and allow customization. The Data Generator is a 32 bit Windows application that runs on the Vision PC in the background.**

Available on **new machines** or **may be retrofit** to your existing ESAB or competitive waterjet system.

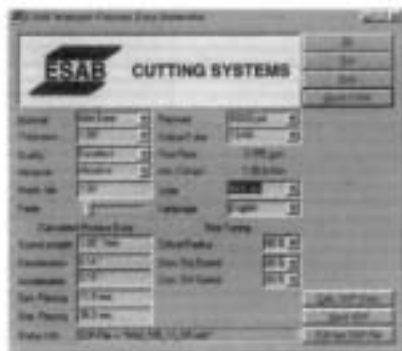
 ESAB's **Vision PC** CNC controller for waterjet cutting combines remarkable ease of operation with powerful software tools like real-time tool path display and kerf-on-the-fly with kerf-override to offer the most technologically advanced control in the industry. This Windows-based controller features menu-driven operation, color LCD display, 8-position joystick, hand wheel, hard drive, 3.5" floppy drive, and speed potentiometer for easy operator use. Station and process control are integrated in a single ergonomic



*Rugged gantry design and AC brushless digital motors on ESAB's HydroCut provide precise motion control and positioning accuracy.*

operator's panel. A 333 mHz processor and advanced features such as multi-level return, zoom while running, and program continue after power failure further add to the power of this control.

ESAB's exclusive Process Parameter Programming features the unique **Data Generator Program** that automatically optimizes cutting



*ESAB's abrasive cutting nozzle with diamond orifice technology provides maximum cutting speeds with reduced operating costs and extremely simple maintenance. A cutting head with standard Z-axis slide, programmable Z-axis or Z-axis with height control can easily be combined with a Vision PC retrofit.*



Contact ESAB today for more information on how the Vision PC can revolutionize your cutting applications.



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66480 • Monterrey, Mexico  
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Telefax 52-83-50-5920

## Abrasive Recycling In Your Facility

**E**asiJet, the distributor of WARD 24, is now offering to recycle used abrasive sludge in your own facility to prove the process works.

"With many systems now in operation throughout the USA and Canada, we need to be pro-active in eliminating all skepticism about abrasive recycling," says Richard Ward, president of EasiJet, Inc.

The program allows companies using abrasive to schedule a WARD 24 to be delivered to their factory. The system will then be operated for a few days, recycling the waste abrasive sludge generated in the factory. The process typically takes about three minutes to transform waste sludge in

the cutting tank to good, dry, read-to-use abrasive.

The WARD 24 is an abrasive removal and recycling system that will transport the sludge to the top of the washing and separating screen. All undersize abrasive passes through the screen and is considered waste. Each operator can change the mesh size of this top screen, allowing companies to set their own limit as to the mesh size of the recycled abrasive. Only the good, reusable abrasive is then passed into the dryer. The good abrasive is then passed again over a secondary screen to ensure only dust free, clean, graded abrasive is available to be used again.



Results are showing companies are averaging between 50% to 70% recovery of certain grades of abrasive.

(continued on page 18)

## 40,000 psi at 1.2 gpm — 2 economical NLB pumps

NLB's compact ULTRA-CLEAN 40" delivers water jet power of 40,000 psi (2,800 bar). And its slow-running triplex plunger pump, proven over many years, reduces wear and downtime to lower your operating and maintenance costs.

Ultra-high pressure and low flow (just 1.2 gpm, or 5.0 lpm) make the ULTRA-CLEAN 40 ideal for surface preparation, cleaning, cutting, abrasive cutting, and other applications.



Model 4030D has a 44 hp diesel engine.

Model 4030E features a 30 hp electric motor.



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**Look for more nozzle information in upcoming issues.**



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## Flow International Awarded New Contracts

**F**low International Corporation (Nasdaq: FLOW) announced four new contracts totaling nearly \$3 million (U.S.) for its Canadian subsidiary, Flow Automation. Based in Burlington, Ontario, Flow Automation designs, manufactures, and supports complete automation systems to markets worldwide. The four contracts are scheduled to be installed within the next 12 months.

"These four contracts represent the broad application of Flow Automation's engineering technology to its core markets in the United States, Canada, and Europe," said Ron Tarrant, chairman, CEO and president of Flow International.

The new contracts include: Bayer Corporation, which awarded Flow Automation a contract to design, manufacture, and install a machine to assemble blood-testing units at its Mishiwaka, Indiana, facility; Amcan Castings Inc., Hamilton, Ontario, who placed a second order for a machine to assemble and test oil pans used in automotive applications; Calsonic International Europe P.L.C., which contracted with Flow Automation for an assembly system to build evaporator cores for automotive air conditioning systems; and a fourth customer ordered an automated system using advanced assembly technology.

Flow International Corporation is the world's leading developer and manufacturer of ultrahigh-pressure (UHP) waterjet technology for cutting, cleaning and food safety applications. FLOW provides total system solutions for industries such as automotive, aerospace, paper, job shop, surface preparation and food processing.

## Abrasive Recycling In Your Facility, from page 16

### No loss in cutting speed or quality noticeable

Most striking is the fact that not a single operator of any of the WARD 24's presently operating in the USA and Canada has noticed any reduction in cutting speed or performance.

"We have several theories as to why this is the case," says Ward, "but no matter how much we talk about it, we need to have customers prove this in their own shop, with their own abrasive, on their own machines. Hence the offer to run tests with the full system in the factory."

### Reduction of operating costs up to 40%

Recycling of abrasive allows operating costs to be reduced as much as 40%. If a company is using over 10,000 pounds of abrasive per month, the figures typically justify the purchase of an abrasive recycling system. If using less than 10,000 pounds per month, companies are being encouraged to save their

abrasive. The WARD 24 is being used to successfully recycle abrasive that has been stored for years. It's as simple as dumping the old abrasive into the cutting tank and allowing it to then be processed as the current abrasive is being used.

### Recycling abrasives profitable

There is no doubt abrasive recycling cannot help but be the most important contributing factor to economic viability and profitability of waterjet operators. For those who move ahead and recycle abrasive, reduced costs, increased profit margins and a competitive edge are the potential rewards. It is clear, with a Waterjet Abrasive Recycling Dispenser, the savings are too great to ignore.

To learn more about the Waterjet Abrasive Recycling Dispenser and the conditions of scheduling a WARD 24 to be operated in your facility for a test period, contact EasiJet at [www.easijet.com](http://www.easijet.com) or call (330)633-7698.

## Water Cannons, from page 2



Fireboat. (Photograph provided courtesy of Stang Industrial Products.)

## NLB Introduces A Surface Preparation Tool

NLB Corp. has introduced the SRT-6 SPIN JET® surface preparation tool, which increases productivity and minimizes the labor required to manually prepare surfaces with ultra-high pressure water jets. This semi-automated unit quickly removes rust and coatings (e.g., paints, epoxies) from vertical surfaces, such as tanks and ships.

The lightweight (only 35 lbs., or 16 kg) unit features NLB's patented SPIN JET® rotating water jets, which use the power of 36,000 psi water (2,500 bar) to clean down to bare metal. These jets clean a path about three times wider than the path made by a hand-held water jet lance. A counter-balancing system helps ensure that an operator can easily guide the unit without fatigue.

The SRT-6 can be easily attached to a vacuum recovery system to contain debris and water, avoiding the disposal and environmental concerns common to grit blasting. Like manual methods of water jet surface preparation, the process leaves a cleaner surface than



NLB SRT-6 SPIN JET®

grit blasting, without the noise and dust.

The SRT-6 operates at a maximum flow of just 5 gpm (19 lpm). The water is supplied by an NLB ULTRA-CLEAN 36® ultra-high pressure pump unit.

NLB, a global leader in high-pressure and ultra-high pressure water jet technology, manufactures a full line of quality water jetting systems and accessories for many uses. These include surface preparation, tank cleaning, descaling, concrete demolition, paint booth cleaning, concrete and pipe cutting, and more.

## New Tube Bundle Puller

KIDExtractor, one of the largest hydraulic tube bundle extractor manufacturers in the world, has introduced a new line of tube bundle pullers. This new line covers a wide range of applications for bundle weights starting from 22 tons up to 45 tons and for bundle lengths from 20.5 feet (6250 mm) up to 31.17 feet (9500 mm).

The many advantages of KIDExtractor's new line are: new balance system arch compact design, back side engine compartment extension (in order to increase or decrease the working length easily), hydraulic system with variable pump delivery system patented, around 15% more bundle weight capacity than any other tube bundle extractor, around 35%

machine weight less than any other tube bundle extractor, use of CE construction and painting quality certification standards.

In order to better serve customers in the United States and Canada, and to elevate their presence in the market, KIDExtractor proudly announces the starting of direct sales to the USA and Canada.

For more information on our new line and on our special sales offers, please contact us directly at: Ronald Saliba, KIDExtractor Limited, Fishermen Street, N. 43, Marsa HMR 12, Malta, phone: [356]242031, fax: [356]242028, website: [www.kidextractor.com](http://www.kidextractor.com)

## NACE Offers Research Seed Grant Funding

NACE International's Research Committee is soliciting proposals for one \$20,000 research seed grant. The grant period will be from July 1, 2000 through June 30, 2001, and could be extended for one additional year.

The grant is funded by the U.S. Office of Naval research and supported by NACE.

The grant is intended to encourage new researchers to study the corrosion of engineering materials.

Grant recipients will be selected at Corrosion/2000, NACE's Annual conference, to be held in Orlando, Florida, March 26-31, 2000.

Proposals should include the following information:

- a description of the proposed research project, including goals and specific objectives (not more than three double-spaced pages);
- a description of how the grant might be used to obtain additional support from other organizations;
- background on the principal investigator;
- a proposed budget (funds may not be used to support university indirect costs/overhead); and
- a description of other programs underway that might strengthen the proposal.

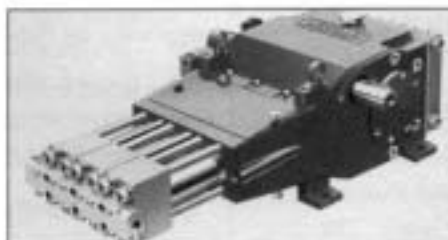
Appendices may be attached, but brevity is encouraged.

The original and five copies of the proposal should be sent **no later than February 1, 2000**, to: Chris Kilmer, Director, Technical Activities Division, NACE International, Research Committee Seed Grant program, PO Box 218340, Houston, TX 77218-8340 (shipping address: 1440 South Creek Drive, Houston, TX 77084-4906).

## WOMA Introduces New Millennium M Series Pump

At the recent IRW Exhibition in Cologne, Germany WOMA Apparatebau GmbH introduced a new addition to its already extensive line of High Pressure Positive Displacement pumps, the 180 M-3000. First in the new Millennium series which will operate at pressures up to 43,500 psi (3000 bar) the 180 M-3000 delivers 4.5 gpm @ 43,500 psi efficiently and reliably.

The Millennium pump series feature WOMA's innovative, Hydrostatically Compensated Valves® technique patented under (DE 19819972 C 1). This unique and patented central valve design guarantees:



The Millennium pump Model 180 M-3000 with the patented HCV®-technique.

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Further features of the WOMA Millennium Series pump include:

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The WOMA Model 180 M-3000 is available with (2) gear ratios allowing for input drive speeds of 1500 and 1800 rpm.

For further information contact: **WOMA Corporation**, phone: 800-258-5530, fax: 732-417-0015, email: [womacorp@bellatlantic.net](mailto:womacorp@bellatlantic.net) Or visit our website at: [www.womacorp.com](http://www.womacorp.com)



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*Chris Daldegan*

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Hammond, IN 46320

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Fax: (219)933-1075

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1341 East Lawn SE

E. Grand Rapids, MI 49506

Phone: (616)475-0034

Fax: (616)475-0034

(continued on page 23)

## Water Cannons, from page 2



Photograph provided courtesy of Stang Industrial Products.

## Welcome WJTA New Members, from page 22

### Mukul Gupta

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MIDC, Thane-Belapur Road  
Navi Mumbai 400 701 India  
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## Jet Edge Earns ISO 9001

**J**et Edge is now registered as an ISO 9001 company under TÜV Essen Quality Registrar. This ISO 9001 certification shows Jet Edge's company-wide commitment to meet or exceed the world's highest quality and consistency standards from engineering, design, and order entry through material procurement, manufacturing, and delivery.

"Achieving this certification demonstrates Jet Edge's commitment to consistently provide high quality waterjet cutting systems that meet the highest international standard," commented Kurt Horsch, ISO Site Manager. "The premise represented by the ISO certification underscores Jet Edge's ongoing commitment and dedication to excellence and safety in serving our customers."

Jet Edge designs, manufactures, and sells ultra-high pressure waterjet cutting and cleaning systems worldwide.

## Calendar Of Events

### OCTOBER 9-11, 2000

The CMTE with its co-hosts the Australian High Pressure Water Jetting Association (AUSJET) and The Water Jet Technology Society of Japan (WJTSJ) are hosting the 6th Pacific Rim International Conference on Water Jetting Technology in Sydney, Australia.

The Conference will focus on the development and implementation of new technologies that contribute to improved productivity, health and safety in the waterjetting industry.

For more information contact: Water Jetting Technology Conference, c/o CMTE, PO Box 883, Kenmore Q 4069, telephone: +61 7 3212 4420, fax: +61 7 3212 4683, email: [cmte@cat.csiro.au](mailto:cmte@cat.csiro.au), web site: [www.cmte.org.au/news/waterjet.html](http://www.cmte.org.au/news/waterjet.html)



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