

Jet News



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Hydrodemolition in the Kingsway Tunnel, Liverpool



The robot, covered by secondary splash protection, operates in the Kingsway Tunnel. See article on page 2



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Hydrodemolition in the Kingsway Tunnel, Liverpool

project to remove concrete from the Kingsway Tunnel under the River Mersey, which was greatly restricted by the hours possible for working, has been completed by Buxton Water Ltd. using an Aqua Cutter HVD robot from Swedish specialist Aquajet Systems.



Hydrodemolition specialist Buxton Water Ltd. used an Aqua Cutter robotic hydrodemolition machine to remove large patches of concrete from the road deck of the Kingsway Tunnel under the River Mersey in Liverpool. The project on the 2.4 km long twin road tunnel could only be undertaken on weekends to minimize disruption to traffic, which consequently required a very fast working technique that could not be achieved by the more traditional methods.

Use of a robot cutter also reduces the manpower needed on site and greatly increases the safety factor as the machine is operated remotely.

The work was undertaken over 26 weekends within a seven-month period, with concrete removal averaging 0.74 m³/hour during 520 hours of work.

Buxton's managing director Mark Hothersall says the company used the Aqua Cutter HVD robot on large patches that had an area of 0.25 m² or more.

Buxton Water operates one of the largest UK-based robotic hydrodemo-

lition fleets from Aquajet Systems of Sweden, and says that this system of concrete removal provides the opportunity for more than five times greater productivity than conventional methods.

With the robotic Aqua Cutter remote controlled and able to operate within restricted access areas, there is no need to have any personnel within the demolition area while the work is being carried out, a significant benefit in improving safety.

Using a high pressure jet of water, the diesel-powered Aqua Cutter robot cuts through the concrete without causing any damage to the structure or the reinforcement bars.

On each weekend the Kingsway Tunnel was closed after the Friday evening rush hour, and the challenge was to remove as much concrete as possible within a 20-hour period, allowing time for the main contractor, Volker Laser, to complete the repairs with sufficient curing time for reopening early Monday.

Mr. Hothersall says the work program allowed for a gradual build up in weeks one and two to ensure the systems and processes worked, and thereafter the target was a minimum removal of 13 m³ on each weekend.

"Repair patch sizes varied from less than 0.1 m² up to 80 m², cutting to an average depth of 110 mm to expose the embedded steel," he says.

Actual productivity per weekend varied according to number and sizes of patches to be removed.

"We were always confident of exceeding the minimum requirement, and what really interested us was to

(continued on page 12)

Vacuum Truck Rentals Acquires UVAC

Tacuum Truck Rentals LLC of Richland, Mississippi, has announced the acquisition of UVAC, Inc. of Pasadena, Texas. UVAC has been a premier rental company in the gulf coast since 1996. Payton Lockey of Vacuum Truck Rentals says, "UVAC is a perfect acquisition for VTR. It accelerates our expansion plans by adding quality equipment in a time where manufacturers' lead times are greatly extended. UVAC has had a similar philosophy to VTR by offering superior service and quality equipment. We are excited to conclude this acquisition and be able to add UVAC equipment and key employees to the VTR team."

Vacuum Truck Rentals is a leading environmental equipment rental company operating seven facilities in strategic locations across the US. The company offers rental equipment that includes vacuum trucks, liquid vacuum trucks, combination sewer cleaners, hydro-excavation units, 130/150 barrel trailers, roll off trucks, container trailers and liquid ring vacuum trucks.

For more information, visit www. vactruckrental.com or call (601)933-4650.

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StoneAge® Teleboom shown here with Torus® tool.

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Diameter	5.6 in. 143 mm	
Weight	35 lb 16 kg	





2012 WJTA-IMCA Expo **Exhibitors** (as of April 2) **Advanced Pressure Systems** Agua Sales, LLC Blasters, Inc. **CSM Supply** Carolina Equipment & Supply (CESCO) **Dragon Products, Ltd. FS Solutions** Fruitland Tool & Manufacturing **GHX Industrial, LLC** GapVax, Inc. Gardner Denver Water Jetting Systems **General Pump** Giant Industries, Inc. **Guzzler Manufacturing Hammelmann Corporation Heintzmann Corporation High Pressure Equipment Company** HoldTight Solutions Inc. JGB Enterprises, Inc. Jack Doheny Companies, Inc. Jetstream of Houston, LLP Kroy Industries, Inc. **LaPlace Equipment Company** mvt AG Maxpro Technologies, Inc. **NLB Corp.** Parker Hannifin-EPD Powertrack International Inc. **Presvac Systems** Ramvac Vacuum Excavators Red-D-Arc, Inc. **SPIR STAR** StoneAge, Inc. Stutes Enterprise Systems, Inc. Terydon, Inc. TurtleSkin WaterArmor by Warwick **Under Pressure Systems, Inc.** Vac-Con. Inc. Vacall **Vactor Manufacturing** Vacuum Truck Rentals, LLC Wilco Supply L.P.

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High Pressure Waterjets Used to Fracture Coke Buildup

by: Sue Petranek

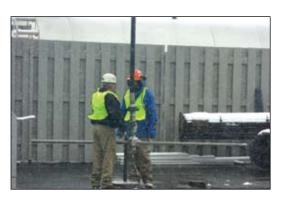
Since 2003, StoneAge
Waterblast Tools of
Durango, Colorado, has
provided custom engineered
equipment for turn-around
cleaning for a Sarnia, Ontario, refinery. Their process
uses high pressure water to
fracture coke buildup from
the walls of cokers which can
accumulate a layer of nearly
pure carbon one foot thick or
more due to the 900-1000 degree heat needed for refining.

This May two StoneAge engineers and one technician will travel to Fort McMurray, Alberta, near the Canadian tar sands, to provide similar equipment for the maintenance of Syncrude Oil's 8-3 coker unit, the largest coker in the world.

For some months, StoneAge has invested a significant amount of resources to the design and testing of super-sized versions of their catalog tools for cleaning Syncrude's 37-foot diameter cokers.

In late February, a demonstration of new tools was held at company headquarters in Animas Air Park in Durango during blustery weather.

For three days, visitors and employees witnessed engineering tests for stability and functionality of the new designs along with exciting displays of water's power. StoneAge's Director of R&D Doug Wright designed one new tool so large it took five men to position it.







Seven pumps delivered hundreds of gallons of water per minute (gpm) for the testing. A section of road 70 feet away temporarily closed because of the spray.

The three StoneAge employees traveling to the refinery north of Edmonton will help oversee the cleaning of Syncrude's 8-3 coker. The goal is

(continued on page 16)



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Letter to the Editor

s a supplier and end user of vacuum and waterblast equipment I thought I would share some of our company's needs regarding waterblast and vacuum solutions that I think once developed could be additional product for your companies:

- 1. The grounding of vacuum trucks - what comes with a vacuum truck will not pass the current requirement of the plants we work in – they require a minimum of a #2 wire – preferably vellow jacketed otherwise it has to be wrapped in caution tape. What is supplied on trucks is a smaller gauge wire usually too short most cases we need 50 feet of the cable from the back of the truck.
- 2. Improved way to an assured ground between connections. The development of the continuity clamp – someone needs to take this and make it a standard part to purchase. The addition of the nuts to the sides of the clamps with pointed 3/8-inch-16 X 2-inch Tuff-Torq hex cap screw (full threaded) assists in an assured ground when attempting to conform to the less than 10 ohms between connections. (See photo.)
- 3. Safely anti-freezing waterblast equipment so it doesn't corrode internals and is safe for the environment upon discharge. We have been working with a



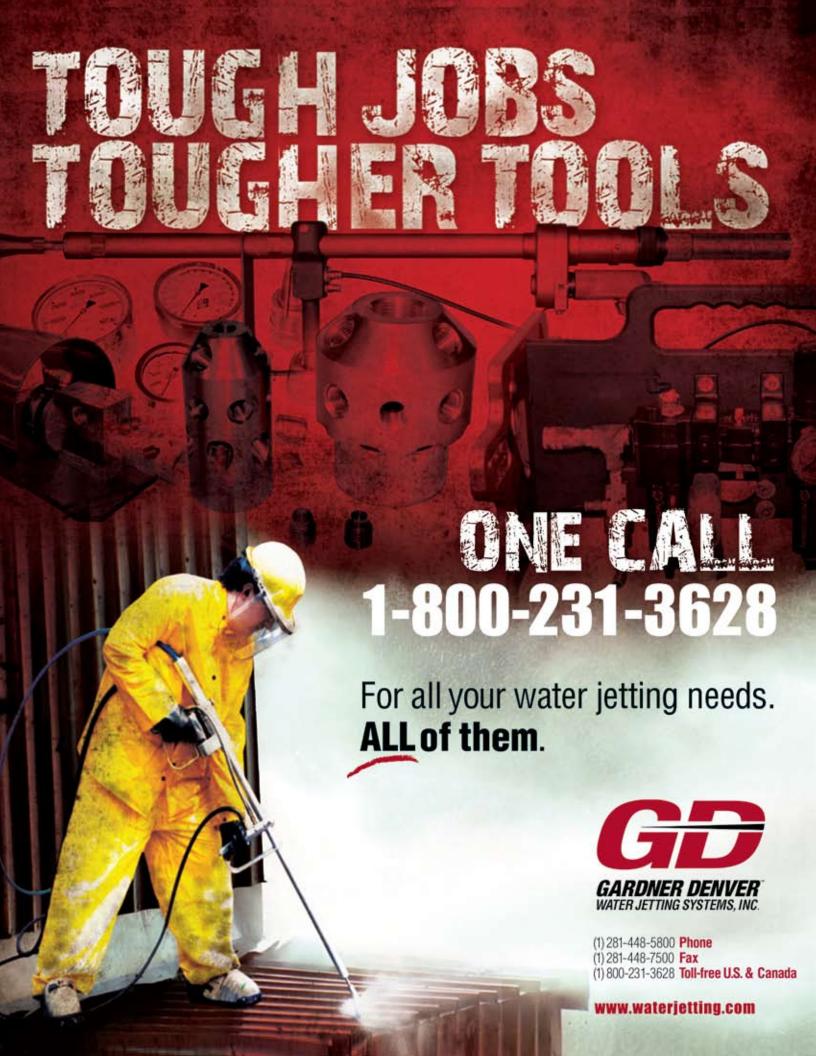
company called Camco that sells such a solution for RVs. I would like to see the industry work with them to develop a specific product for our industry.

Don Morningstar, Safety/Purchasing Jet Blast, Inc.

6800 Fort Smallwood Road Baltimore, MD 21226 Phone: (410)636-0730

Fax: (410)789-3907 Email: don@jetblast.net www.jetblast.net





OMAX® Featured on CNBC and NBC Nightly News

MAX Corporation was the site for three live television broadcasts on CNBC that were then combined into a full length feature story on the NBC Nightly News with Brian Williams. All four segments, which aired on March 8, 2012, focused on the booming U.S. manufacturing industry and how manufacturers like OMAX are challenged to find sufficiently trained workers to meet increased production demands.

CNBC reporter Phil LeBeau broadcasted live from the OMAX demo lab and from the company's manufacturing area where it produces its abrasive waterjet cutting systems. LeBeau's first report was during the CNBC program "Squawk Box," his second on "Squawk on the Street" and his third on "Street Signs." LeBeau then prepared and presented the full-length story titled "Help Wanted" on NBC Nightly News.

Each of the three CNBC segments and the NBC report included footage of OMAX machines and of interviews with OMAX employees, including OMAX CEO Dr. John Cheung. Dr. Cheung discussed the company's increased sales and exporting of machines, as well as the additions to its workforce made over the past years and the current open positions at OMAX. He also mentioned that today's young people should definitely consider a career in



CNBC reporter Phil LeBeau

manufacturing and that manufacturing has progressed into a very high-tech and lucrative field.

For more information on OMAX products and accessories, contact Sandra McLain at 800-838-0343 or visit www.omax.com.





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OMAX® Waterjets Make Great Lab Partners for UBC Students

Students of the engineering physics program at the University of British Columbia (UBC) in Vancouver, Canada, are highly focused on advancing science through new, high-tech inventions. Therefore, the university relies on OMAX waterjet technology to fabricate the precision parts that bring student creations to life.

Examples of what UBC students can invent using advanced OMAX waterjet machining, including a harmonograph system for drawing intricate 2D patterns, a new spoke-free suspension system for a bicycle and an unmanned aerial vehicle, were on display March 6 during the university's 2012 Engineering Physics Project Fair.

Furthermore, because OMAX waterjets are key learning tools within all UBC engineering departments, from physics to chembiological, the university is having Dr. John H. Olsen, OMAX co-founder and vice president of operations, speak to students about his vast knowledge of the waterjet industry during the project fair.

According to Dr. Jon Nakane, director for the UBC Engineering Physics Project Lab, he believes OMAX makes high quality machines that offer amazing speed and simplicity, which is critical for an academic environment He said the OMAX 2652 JetMachining® Center in his lab successfully cuts through almost any type of material, including sheet steel, aluminum, Lexan® and other plastics, circuit boards, rubber sheets for custom gaskets and plywood for press-fit shapes. He also noted students have machined items ranging from as small as single millimeter-thicknesses to as large as barely fitting on the machine's bed.

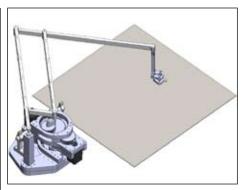
"After years of fabricating items using traditional mills and lathes, and submitting parts to our professional in-house machine shop for CNC fabrication, my department's OMAX machine lets students fabricate parts and get working solutions faster and easier than before," said Nakane. "My students love the fact that they can get their parts designed and 'working' in CAD, then see how closely they can get to a real-world object using the waterjet cutter."

Unlike conventional mill and lathe machining processes, the OMAX 2652 provides the quick turnaround of accurate parts without the hassle of tool changes or complex fixturing. Furthermore, the 2652 produces smooth surface finishes, eliminating the need for secondary machining. Plus, students get to enjoy clean, safe machining operations that are free of noxious gases, liquids and oils.

In addition to the OMAX 2652 in the Engineering Physics Lab, the UBC also owns a second 2652 as well as three OMAX 2626 JetMachining Centers and a MAXIEM® 1515 JetCutting Center.

"We appreciate the high level of service and support we receive on all of our waterjet machines from OMAX," concluded Nakane. "Parts arrive quickly, the people are helpful and the level of documentation for the care and regular maintenance of the machines is impressive."

For more information on OMAX products and accessories, contact Sandra McLain at 253-872-2300, or visit www.omax.com.



Harmonograph. An OMAX 2652 helped UBC students develop this harmonograph, a system for drawing intricate 2D patterns.



Hubless Bicycle. Called the hubless bicycle project, UBC students used the OMAX 2652 to create a non-spoke suspension system inside a bike rim.



Unmanned Aerial Vehicle. An OMAX 2652 cut the intricate inner aluminum structure of this unmanned aerial vehicle.

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Hydrodemolition in the Kingsway Tunnel, Liverpool, from page 2

know just what could be achieved in such a short working timeframe," says Mr. Hothersall. "We actually achieved an average removal rate of 14.8 m³ per 20-hour weekend shift, and peaked at 17.9 m³.

"Such consistently high levels of productivity demonstrate the effectiveness and efficiency of the Aqua Cutter hydrodemolition system, particularly when coupled with effective management of logistics and an outstanding contribution from our jetting crews."

For further information contact: Stefan Hilmersson, Aquajet Systems AB, Brunnsvägen 15, SE-570 15 Holsbybrunn, Sweden, Tel: +46 (0)383 508 01, Fax: +46 (0)383 507 30, email: aquajet@aquajet.se.■



NLB 125 Waterjet Units Now Convertible to 40,000 psi

LB has expanded the operating range of its 125 Series convertible water jet pump units to include ultra-high pressures. All models can be converted in about 20 minutes to any of eight operating pressures, from 6,000 psi to 40,000 psi (414 bar to 2,800 bar), using NLB's simple conversion kit.

Fast conversion to 35,000 psi or 40,000 psi gives users more flexibility to do diverse jobs with a single water jet pump unit. This flexibility is en-

hanced by the range of flows (4.4 gpm to 32.5 gpm, or 16.5 lpm to 123 lpm) and a choice of engines, 125 hp or 145 hp (93 kW or 108 kW).

The NLB 125 Series includes diesel and electric models, all offering long life, easy maintenance and low operating costs. NLB has 22 convertible water jet pump units capable of operating at 40,000 psi, the most in the industry.

For more information contact NLB at (248)624-5555 or send an email message to nlbmktg@nlbusa.com.



2012 WJTA-IMCA Expo Hilton Americas -Houston

The Hilton Americas – Houston, 1600 Lamar, Houston, TX 77010, is directly connected to the George R. Brown Convention Center via two indoor sky-bridges. The room rates are \$146 single/\$156 double occupancy. Reserve your room online at www.wjta.org, or call toll-free (800)236-2905 or call the Hilton directly at (713)739-8000.

Friday, August 17, 2012, is the deadline for guaranteed room availability. Reservations received after August 17 will be confirmed on a space available basis. Rooms may still be available after August 17, but not necessarily at the rates listed above.

Alternate Hotel

The Hyatt Regency Houston, 1200 Louisiana Street, Houston, TX 77002, is a 15-minute walk from the George R. Brown Convention Center. The room rates are \$146 single/\$156 double occupancy. Reserve your room online at www. wjta.org or call (888)421-1442. When calling, mention the group code G-WAJJ to receive the group rates.

August 9, 2012, is the deadline for guaranteed room availability. Reservations received after August 9 will be confirmed on a space available basis. Rooms may still be available after August 9, but not necessarily at the rates listed above.

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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Jet Edge Featured on History Channel's Modern Marvels

aterjet systems manufacturer Jet Edge, Inc. was recently featured on the History Channel's Modern Marvels: Under Pressure episode (Jan. 30 on H2). A recording is posted on www.history.com.

During "Under Pressure," Modern Marvels explores the science behind Jet Edge's 90,000 psi industrial waterjet cutting technology and explains how ordinary tap water and sand can be transformed into a cutting stream powerful enough to cut through 15-inch titanium and precise enough to manufacture precision parts for teams racing in the NASCAR® Sprint Cup Series.

In keeping with the theme of "Under Pressure," the episode was shot at Michael Waltrip Racing in Cornelius, NC, where the team was racing to get ready for the fall race in Talladega, AL. MWR uses a Jet Edge waterjet cutting machine to cut more than 1,000 parts for each of its NASCAR Sprint Cup Series racecars, including the #55 Aaron's Dream Machine Toyota Camry driven by Michael Waltrip and Mark Martin, the #56 NAPA Auto Parts Toyota Camry driven by Martin Truex Jr., and the #15 5-hour ENERGY Toyota Camry driven by Clint Bowyer.

"What could be under more pressure than a 90,000 psi waterjet and a NASCAR team getting ready for their next race?" said Nancy Lauseng, Jet Edge marketing manager. "We're thrilled at how Modern Marvels and History explained the very cool science behind creating ultra high pressure water and how waterjets are used to cut virtually any material. You come into contact with things every day that were cut with waterjet and probably don't even realize it. The rubber floors at your gym, the baby carrots you had for lunch, the diapers on your baby, and your car's steering wheel were all made with waterjets, and many of those waterjet systems were built by Jet Edge."



Michael Waltrip Racing uses SigmaNest CAD-CAM software to tightly nest parts. This increases productivity and reduces material waste by cutting as many parts as possible out of a sheet of material.



Michael Waltrip Racing Technical Director Nick Hughes explains how MWR uses its Jet Edge waterjet to cut more than 1,000 parts for each of its racecars. Courtesy Jet Edge.

For more information about Jet Edge, visit www. jetedge.com, or call 1-800-JET-EDGE (538-3343). Follow us on Twitter @jetedge. For more information about Michael Waltrip Racing, visit www.michaelwaltripracing.com.

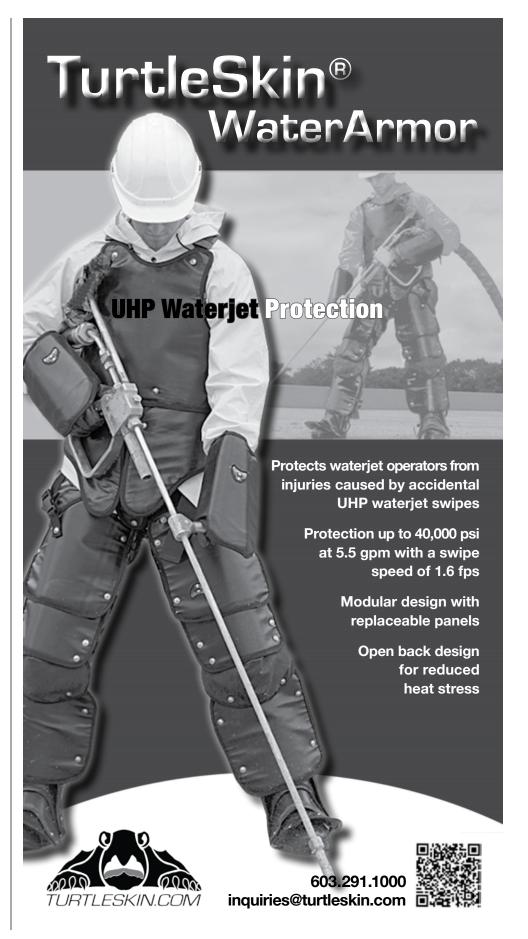




Comments Solicited on Improvements to Recommended Practices

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.



David Anderson Appointed to Minnesota District Export Council

Tet Edge International Sales Manager David Anderson has been appointed by U.S. Secretary of Commerce John Bryson to serve a fouryear term on the Minnesota District Export Council (DEC).

The Minnesota DEC is a private, non-profit organization under direction from the U.S. Department of Commerce that brings together experienced international business people from the private sector who provide guidance and assistance in international markets. The council works alongside the U.S. Commercial Service to promote exports through business counseling, networking, education, and community outreach.

Anderson brings to the DEC more than 20 years of experience in international sales management to share with other small and medium sized businesses in Minnesota who are just beginning or thinking about exports as a way to grow their companies' revenues. During his career, he has traveled extensively throughout the world and has established original equipment manufacturers (OEMs), dealers, and distributors in approximately 35 countries on six continents. His accomplishments at Jet Edge include



Jet Edge's David Anderson (left) is recognized by U.S Secretary of Commerce John Bryson. Courtesy Jet Edge.

opening a sales, service, and training office in China, establishing an R&D partnership with waterjet manufacturer Tecnocut S.p.A. in Italy, and establishing new export sales for Jet Edge in Japan, China, South Korea, Poland, Italy, and the Middle East. Anderson also has established a rigorous training program for all international distributors to ensure they are equipped to provide optimum service and support to Jet Edge's overseas customers.

For more information about Jet Edge, visit www.jetedge.com, e-mail sales@jetedge.com or call 1-800-538-3343.

Reliable Pumps Consultants, Inc., Names Mike Woodward Senior Sales Consultant

lenn E. Reed, president of Reliable Pumps Consultants, Inc., in Houston, Texas, has announced the appointment of six-time concurrent patent recipient Dr. Mike Woodward to the position of senior sales consultant.

Dr. Woodward brings more than thirty years of engineering, management, and sales experience and is a recognized world-wide expert in the field of high pressure waterjetting, having presented numerous technical papers at international waterjetting conferences, and acted as a founding member and board member of the WaterJet Technology Association.

Dr. Woodward was also instrumental on the subcommittee to develop industry specifications for the ASME Vessel Code.

He graduated from the University of London's Imperial College of Science and Technology (London, England), having earned a doctoral degree (high pressure engineering), and a bachelor's degree (mechanical engineering).

For further information, contact Russell Reed at (713)640-2718.

High Pressure Waterjets Used to Fracture Coke Buildup, from pg. 4

to remove the thick layers of coke while preventing damage to the refractory, which lies underneath. The high temperature used in the coker cracks molecules of bitumen to upgrade it to a synthetic crude.

The carbon coating left behind with the tar sands refining methods may be different than in Ontario's Sarnia facility, where StoneAge tools clean cokers that refine crude to gasoline. The tools used in Fort McMurray are, "bigger, stronger, higher-flow than our standard products. These custom tools will only be used at the Syncrude facility," explains a StoneAge employee.

Using high pressure water to do the work of breaking coke out of the tall cylinder is expected to take 17 days off the former turn-around time and save Syncrude \$136 million.

During the shutdown, four nozzles will drop 75 feet into the coker; two

will spray 300 gpm and two other nozzles will spray 200 gpm simultaneously. Truckloads of carbon chunks will be hauled away after being channeled through a 16-inch exterior orifice. Any chunks too large to pass through the opening will be broken up by the operator of a "chunky tool," which is a special tool that assists in breaking coke into smaller pieces.

To a refinery coker, this is like getting your teeth cleaned.■

Jet Edge Cuts Logo for National Geographic Channel's 'DIGGERS'

National Geographic TV's new show "DIGGERS" features a metal "DIGGERS" logo cut by waterjet manufacturer Jet Edge, Inc. The waterjet-cut logo is featured prominently at the beginning of each episode.

DIGGERS, which piloted with two episodes on Feb. 28, features the zany treasure hunting adventures of Tim Saylor and George Wyant, extreme metal detecting experts and founders of AnacondaTreasure.com. During the opening of each episode, "Team ATC's" "King George" and "Ringmaster Tim" dig up the DIGGERS logo cut by Jet Edge.

Jet Edge cut the ¼-inch thick steel DIGGERS logo with a 90KSI X-



Stream-powered Jet Edge High Rail Gantry waterjet cutting system. To distress or age the part and encourage faster rusting, Jet Edge's test lab crew ran a fan-tipped waterjet head over the finished part to rough up the surface, then raised the water level in the tank and let the part soak overnight under water on top of metal slats. The part was then sprinkled with sidewalk salt and left on the slats for a day to



continue rusting. Within two days, Jet Edge had a part that looked like it had been in the ground for years waiting for DIGGERS to find it.

For more information about Jet Edge, visit www.jetedge.com, e-mail sales@jetedge.com or call 1-800-JET-EDGE (538-3343). Follow us on Twitter @jetedge. For information about DIGGERS, visit http://channel.nationalgeographic.com.





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MultiCam® Robot Slider Facilitates Welding Applications

ultiCam® Inc., a global CNC cutting system manufacturer, designed its Robot Slider for the rough environment of robotic welding. It's also ideal for high-speed, high-velocity, medium-duty pick-and-place applications, painting and other related activities.

At 14 inches tall along the track, the sleek, low-profile system is easy to step across. The robot track features a 35-mm precision linear guide rail. Its precision-ground helical rack can support multiple trolleys up to two meters in length and equipment weighing up to 10,000 pounds.

MultiCam used state-of-the-art 3-D modeling software to design the Robot Slider and tested it with Finite Element Analysis (FEA) before releasing it to production. The frame is a stress-relieved, precision-machined weldment featuring only the best components. Multi-Cam assembles it with a hypoid beveled-gear precision planetary gearbox, automatic lubrication, integrated over-travel-limit switches, integrated lifting eyes, heavyduty mechanical hard safety stops and leveling feet that anchor to the floor easily.

Optional tread plate covers protect precision components from splatter during welding operations. Modular design allows for extended lengths. The Robot Slider is available with quiet e-chain or conduit rail (bus bar) connectivity to extend the robot track by one-meter increments. Inner dimensions are 9.84 inches wide by 2.2 inches high.

The MultiCam Robot Slider offers a new level of functionality and affordability.

To learn more about MultiCam's CNC cutting solutions, visit www.multicam.com, email sales@multicam.com or call (972) 929-4070.

WJTA-IMCA ListServ - A Free Service To WJTA-IMCA Members

The *WJTA-IMCAListServ* enables you to take advantage of prompt email interaction with your colleagues. *WJTA-IMCAListServ* is a **FREE** email broadcast system developed by WJTA-IMCA to help you communicate and network with other waterjet and industrial cleaning and vacuuming professionals.

Participation is limited to WJTA-IMCA members in good standing. You must sign up in order to participate. To sign up for the *WJTA-IMCAListServ*, contact Pete at the WJTA-IMCA office by email: wjta-imca@wjta.org, phone: 314-241-1445, or fax: 314-241-1449.



2012 WJTA-IMCA Expo Boot Camp Sessions Preliminary Topics

- High Pressure Waterblasting Applications
- Hydro-Excavation
- Nozzle Selection Pressure Loss, Jet Quality, and Other Technical Aspects
- PSC's Hose Integrity and Reliability Program
- Reduction of Hydroblasting Manual Labor
- Safe Use and Care for Ultra High Pressure Hose
- Safety in the Work Place and New Innovations in Safety Equipment
- Safety Procedures from the End User's Point of View
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- Feasibility Investigation of De-fouling Tunicates from Mussel Socks with Cavitating and Pulsed Waterjets, By: Bruce Daniels, *Canada*.
- 4. Flow characteristics of abrasive suspension jet issuing form a fan jet nozzle, By: Seiji Shimizu, *Japan*.
- Experimental investigation of the effect of process parameters on machining of GFRP composites using Abrasive Water Suspension Jet submerged in water, By: Anjaiah Devineni, *India*.
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- Coal and gas outburst control using the Waterjet technique in outburst prone soft coal seams in coal mine, By: Tingkan Lu, *China*.
- 8. Abrasive-Waterjet Technology for Biomedical Applications, By: Peter Liu, *USA*.
- Waterjetting Research for Restoration of Bridges Lack of Popularity, Rob Roy, USA.
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wbloom@vln-tech.com

Tel: 1-613-747-0107, Ext. 107

Fax: 1-613-747-1395

MultiCam® Names Rick Burns Graphic Designer

ultiCam® Inc. appointed Rick Burns graphic designer. He has over 15 years of experience creating brand value for Fortune 500 companies, advertising agencies and non-profit organiza-

agencies and non-p

"Rick's skills include 3-D design, web development, interactive media, illustration and photography," says John Harris, director of sales and marketing. "He's responsible for designing MultiCam's websites, advertising, print media and collateral materials."



Rick Burns

After studying art at Maryland Institute in Baltimore, Rick worked as a web and print designer at Radio Shack, Argo Data and EDS. He's managed high-visibility projects such as Byron Nelson Championship advertising and Mary Kay convention presentations.

Reach him by email at rick@multicam.com or call him at 972-929-4070 X2008.

Ben Callahan Appointed Jet Edge North Central Regional Sales Manager

Jet Edge, Inc., has appointed Ben Callahan as its new North Central regional sales manager.

Callahan is responsible for Jet Edge waterjet equip-

ment sales and application support in Iowa, Minnesota, Nebraska, North Dakota, South Dakota and Wisconsin. A waterjet industry veteran, Callahan has been with Jet Edge since 2001, where he has held positions directly supporting customers as a service engineer and waterjet applications lab engineer. Jet Edge customers will benefit from his extensive product



Ben Callahan

and applications knowledge. He studied machine trades at Dunwoody Technical College in Minneapolis.

Callahan is based at Jet Edge in St. Michael, MN. Contact him by telephone at (612)963-0933 or email: sales@jetedge.com.



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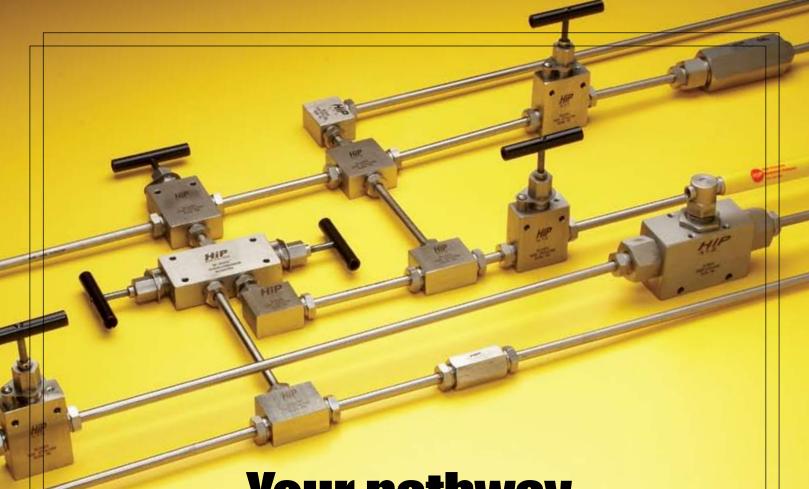
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