

Managing the Plant Turnaround Squeeze



Contractors can take several steps to manage turnarounds safely and effectively. Workers should have adequate personal protective gear when operating waterblast equipment. Photograph courtesy of Hydro-Klean LLC.

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Managing the Plant Turnaround Squeeze

Plant turnarounds are getting shorter and shorter. Just ask Henry Johnson, general manager at Smith Industrial Services in Mobile, Alabama. With six locations in the Southeast, Smith does a lot of business with pulp and paper plants.

“Years back, turnarounds ran ten to fourteen days. Then it was ten days. Now it’s down to five to seven days,” Johnson says.

Plants only make money when they are running, so managers can maximize margins by compressing turnarounds. That means contractors must juggle people and equipment to do the job quickly and safely.

Contractors can take several steps to manage turnarounds safely and effectively.



High pressure waterblasting can be used to remove rust, old coatings or product residue, or to provide a profile for new coatings to adhere better to a surface.

Preparation

Keep your crews trained and their paperwork in order. Most plants expect certificates for OSHA 40-hour training and drug testing. Some also want confined space and toxic materials too.

The need for cleaning tubes like the one pictured here arises because the medium that is transported through the tubes may cause deposits, which can become obstructions. Corrosion of the tubes over time can also be a cause of reduced tube efficiency or even tube failure. Tube cleaning restores the efficiency of heat transfer in and out of tubes.



(continued on page 4)

Selecting the Most Effective Waterblast Pressure and Flow for a Given Standoff Distance

by: Doug Wright, StoneAge, Inc., Durango, Colorado, USA

ABSTRACT

When selecting equipment and pumps for a waterblast cleaning job, many contractors now have the ability to choose from a range of pressures and flow rates for a particular task. As the equipment type and method of approach is selected, a working standoff distance can be determined. Based upon previous tests of jet deterioration with standoff distance, a prediction can be made as to which combination of available pressure and flow will have the greatest impact at the surface to be cleaned. The purpose of this research is to determine how to best predict the relative performance of equal power systems at a given standoff distance to aid in the selection of the most effective operating pressure and flow rate.

1. INTRODUCTION

When selecting a waterblast system configuration to achieve effective cleaning or material removal for a given standoff distance, it is useful to have a mathematical estimation of the impact resulting at the surface to be cleaned. This allows comparison of various pressures and flows that may be available based on existing pump selection, and aids in specifying the system requirements to obtain the desired results.

As an example, a contractor has two equal power pumps, one capable of 80 lpm (21 gpm) at 138 MPa (20,000

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StoneAge and NLB Corp. Settle Patent Infringement Lawsuit

StoneAge, Inc. and NLB Corporation have resolved their patent infringement dispute on mutually agreeable terms. StoneAge has granted NLB a covenant in exchange for a royalty to allow NLB to continue to manufacture and sell its Typhoon rotary nozzles. NLB vigorously contested StoneAge’s claims, and did not admit liability. The other terms of the resolution are confidential.

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Managing the Plant Turnaround Squeeze, from page 2

Workers should have adequate personal protective equipment. Supervisors should enter a plant with contacts for questions and emergencies.

The right equipment

Faster cleaning requires more equipment. Smith Industrial Services often cleans multistage evaporators up to 40 feet long with 2,000 tubes.

“We used to run four waterblasters, now we’re using six to eight,” Johnson says. That gets tight. Johnson tries to free up room by starting three waterblasters on a single stage, then shifting one unit to another stage as the work progresses.

Well-maintained equipment and spare parts are a must. Keith Shepherd, vice president of Prim Industrial Contractors, Bolingbroke, Georgia, keeps his equipment well maintained and clean so it is always ready. He also brings spare parts.

“There are not too many things on a blaster that we can’t fix in 15 or 20 minutes if I’ve got the parts,” Shepherd says.

For larger jobs, Smith Industrial Services rolls out a 48-foot moving

van that is converted into a shutdown trailer. “It provides field support with supplies, nozzles, and all the other things we need,” Johnson says.

The right people

Contractors scramble to get the right people on the job, especially in emergencies.

“We’ll pull people off different jobs just to get them started until we can get a full crew on,” Shepherd says. If Prim Industrial Contractors is overbooked, Shepherd calls other contractors to fill the gaps. “We have several companies we depend on, and they depend on us. We’ll all drive all night to get a crew there. We won’t leave our customers stranded,” Shepherd says.

Shift changes get special attention at Smith Industrial Services, which runs 12-hour shifts. “It’s like NASCAR when 70 to 90 workers change shifts,” Johnson says. “We shut everything down, check fluid levels, filters, foot controls and other equipment.

Supervisors check work pieces and see where they stand. Then we start up and start cleaning.”

Smith Industrial Services works crews two weeks straight if necessary. To keep its trained workers, it pays well and offers medical and dental insurance.

Play on a team

During turnarounds, contractors work around



Technicians use waterblasting equipment to clean evaporator tubes at an ethanol plant. Cleaning shutdowns at ethanol plants require expert planning, communication, and execution to return the plant to full production without delay.

electricians, boilermakers, pipefitters, welders, other tradesmen, and sometimes other cleaning contractors as well. This requires balancing priorities.

“We’re working for two different types of people,” Shepherd says. The first are the other contractors. They cannot start working until Prim Industrial Contractors finishes. Shepherd treats them like customers, and tries to make them happy. The second are plant management, and he will not authorize additional work unless they sign off on the cost.

Good planning reduces friction. Johnson, for example, always checks schedules for welders. “Water and electricity don’t mix,” he says. “So if we’re on the fourth floor, that water is going to run down. If you look at the plan, you’ll know where the problems will be.”

When disputes arise, Shepherd and Johnson never argue. “I just go to whoever is paying the bills and ask who has the most critical path. It doesn’t matter to me. Just tell us what we need to do,” Shepherd says.

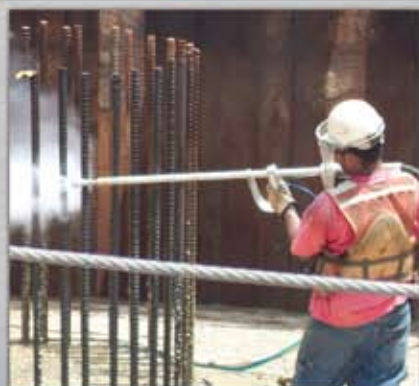
(continued on page 19)



Plant turnarounds are getting more complex, but contractors have stepped up by being prepared and making sure they have the right people and proper equipment at the site.

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Selecting the Most Effective Waterblast Pressure and Flow for a Given Standoff Distance, from page 2

psi), and the other 160 lpm (42 gpm) at 69 MPa (10,000 psi). If this flow is divided into two jets, typical of a balanced waterblasting tool, the respective orifice sizes would be 1.4 mm (.053 in.) and 2.2 mm (.088 in.) diameter. Which system will produce the most effective impact at the surface to be cleaned, if the application will require a standoff distance of 800 mm (31.5 in.)?

A method of estimating the relative performance can be based on charts of known jet performance deterioration that occurs with increasing standoff distance; such a chart is shown in Figure 1. The jet deterioration is known to be proportional to the orifice diameter, in the ratio of standoff distance divided by orifice diameter. For

the example above, this ratio would be 600 orifice diameters at the higher pressure, and 360 orifice diameters at the lower pressure. By taking the percentage deterioration from the chart at these two ratios, one could potentially predict the relative performance of the two systems.

The purpose of these tests was to determine if applying the percentage deterioration from the chart to the initial jet pressure would be comparable in performance to the same jet at this percentage lower pressure at a minimal standoff distance.

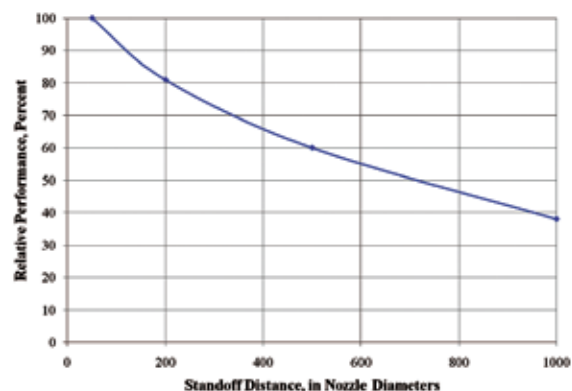
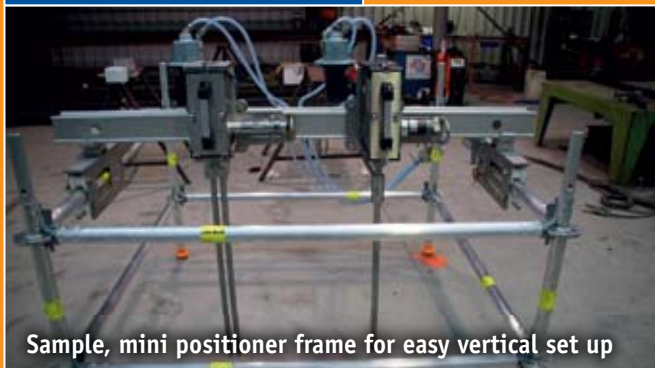


Figure 1. Relative Performance vs. Standoff Distance Tapered Carbide Nozzle with Good Upstream Conditions

This information could then also be applied in the prediction of actual

(continued on page 16)

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Subsea Waterjets Capable of Cutting and Blasting at Depths of 3000 meters

Chukar Waterjet, Inc., an industry leading manufacturer and applications consultant for subsea ultra-high pressure waterjet equipment, presented “Waterjet Technology and Applications Deepwater Subsea” at the Underwater Intervention show in New Orleans in January.

Chukar Waterjet General Manager Bruce Kivisto discussed recent advancements in subsea waterjet technology that make it possible to deploy waterjet cutting and blasting equipment at depths in excess of 3000 meters. These advancements present tremendous new opportunities for deepwater emergency response operations, salvage operations, and rapid de-mobilization operations using

ultra-high pressure waterjet cutting and blasting equipment.

Kivisto’s presentation highlighted numerous applications for subsea waterjet equipment. Effective at cutting steel up to 250 mm thick or waterjet blasting at pressures up to 3,800 bar, Chukar’s subsea waterjet equipment has countless potential applications. It can be used to blast away coatings and marine growth to inspect welds, or as a cutting tool in emergency response and salvage operations. Waterjet equipment may also be used to provide turbulence in a stream of methanol for hydrate remediation.

The advantages of waterjet over conventional subsea cutting and

cleaning tools was discussed during the presentation. Unlike conventional tools, the tools used in a waterjet system cannot bind in the cut, jeopardizing asset integrity. Waterjet cutting also reduces the hazard of igniting trapped pockets of gas during cutting.

For more information, visit www.chukarwaterjet.com or call (763)497-8749.

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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The advertisement features a large, dynamic splash of red garnet abrasive material against a white background, with a blue wavy pattern at the bottom. The Barton logo is prominently displayed in red, with the tagline 'Global Leader in Garnet Abrasives Since 1878' in grey. Below the logo, the text 'Waterjet Abrasives' and 'Waterjet Parts & Accessories' is written in blue. At the bottom left, the phone number '800-741-7756' and website 'www.barton.com' are listed in white.

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Georgia Tech's Student Inventions Solve Real-World Problems

Recently, highly influential judges, including representatives from OMAX® Corporation, Shell Oil, Metronix, Inc., and Emory University, attended Georgia Institute of Technology's Capstone Design Expo to evaluate 40 mechanical and biomedical student projects from the school's mechanical engineering senior design course.

"The Capstone Design Expo is a great opportunity for student teams to showcase the hard work and creativity they've put into their semester-long projects for outside sponsors," says Craig Forest, assistant professor at Georgia Tech in the GW Woodruff School of Mechanical Engineering. "As part of the expo, the school uses an esteemed group of judges to help select the three most innovative, useful, and market-worthy projects."

Each team consisted of four to five students who worked together to define their project, perform research, develop a design and then fabricate, test and refine their prototypes—all under the tutelage of faculty and external sponsors or mentors. In the past, student teams have worked on commercial projects for Delta Air Lines and Coca-Cola.

The students created their project prototypes in the Woodruff School's Invention Studio, a facility that invites all Georgia Tech students and faculty to come in and develop their own inventions using advanced machine tools and electronics equipment, including an OMAX 2626 JetMachining Center. The Invention Studio is free for them to use and open 24 hours a day.

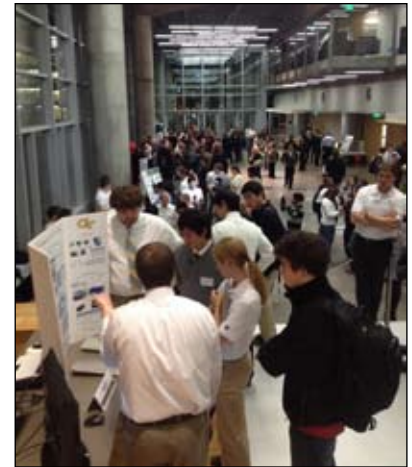
Steve Brown, director of government educational solutions for OMAX, was selected as one of the judges because OMAX's class-

leading waterjet technology was responsible for making most of the expo's prototypes. He and the other judges were tasked with determining how well the student teams applied prototyping and analysis to solve real-world problems.

A new type of sternal retractor, a device that cuts through the human sternum and cranks open the rib cage, was named one of the winning projects for its ability to eliminate blood loss and avoid rib cracking—common problems of current designs. First, second and third-place winners received a cash prize of \$500, \$300 and \$200, respectively.

Brown has been involved with Georgia Tech since 2009 when the university, per the request of Professor Forest, purchased the OMAX 2626 for the Invention Studio.

"We graduate approximately 400 mechanical engineers per year, and all of them have utilized the OMAX waterjet machine," says Forest. "It is the workhorse of our Invention Studio, and I absolutely love it. Students enjoy the fact that it is so easy to use."



Forest became familiar with the OMAX brand of abrasivejet machines while attending the Massachusetts Institute of Technology to earn his Doctor of Philosophy and Master of Science degrees. "We had several OMAX machines at MIT, and I used all of them. I find they are the best waterjets on the market."

According to Brown, several other universities across the nation utilize OMAX machines as part of their curriculum, including Harvard, Princeton, University of California at Berkeley and Florida State.

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Australia's Metco Now Distributes Aquajet Hydrodemolition Equipment

Metco Ltd., based in Adelaide, South Australia, and a specialist in water cleaning and cutting, has recently been appointed the distributorship for Sweden's Aquajet hydrodemolition equipment, tasked with opening up a market that has until now been resistant to the technique.

"The concept of hydrodemolition here is relatively new, compared with Europe where it has been proven for 50 or 60 years," says Metco's Managing Director Derek Bade.

"This is a young market. People don't know the concept. A lot of our young engineers starting their careers have never heard of it. We believe the market will take to the concept, especially when they see how much can be saved in the way of manpower and cost, but the problem is that the present methods of demolition are so ingrained in the way of working, and the way of costing. It really is only practical demonstration and experience that can overcome that."

On taking delivery of the HVD 6000 Aqua Cutter, Metco mounted a dump-valve to the unit, making it possible to switch off the water pressure when it is working, so as to simply 'dump' the water rather than turn off the entire machine, making the unit more environmentally friendly.

"This allows us to control the water and the operation at all times," says Bade, adding, "One reason that hydrodemolition has not made much headway in Australia is that many parts of the country are very dry and suffer from drought, and consequently equipment that is perceived as using and wasting a lot of water is regarded unfavorably. So by controlling the water supply like this, we believe that local contractors will regard hydrodemolition as being environmentally friendly."

The company has also invested in one of the new Aqua Cutter Evolution 710 machines, which it plans to use as a rental unit.

Metco was founded 30 years ago and in 2008 came under the ownership of Bade. The company is now split into two sections: industrial, which is headed by Bade, and rentals, headed by Kevin Ashby.

"The Australian construction equipment market likes things to be simple, and likes things to work," says Bade. "People have tried hydrodemolition before, but it has never really caught on. They continue to do things the old way with jackhammers. Until now, any project plan will automatically be costed out using jackhammers. That is the system that is tried and tested. No plans are costed out using hydrodemolition. So there is scope for us to say, listen, this is not the only way."

"Of course, there is a strong argument that the jackhammer operators are losing money. But economics and efficiency and environmental requirements add up to a strong argument pro hydro."

Basic principles of hydrodemolition

The key element of hydrodemolition is to pressurize and widen existing pores and micro cracks in the weakened concrete structure using high pressure water penetration. Material is easily removed as the build up pressure exceeds the tensile strength of the damaged or weakened concrete.

In addition to the water pressure, the volume of water is also a contributing factor to the efficiency of the systems. The rate of removal, for example, is dependent on the amount of water directed towards the concrete surface

in order to rapidly and continuously pressurize the areas being treated.

This combination of water pressure and flow, together with the controlled kinetic and geometric movements of the robotic equipment, creates the necessary 'effect' criteria for the hydrodemolition process – leaving sound concrete undamaged.

Research into waterjet erosion has shown that the concrete resistance against waterjet removal is dependent on concrete strength, method of finishing the concrete, aggregate size, and the content of steel reinforcement bars.

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Phone: (281)471-3368

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Peinemann will display the new 2LTC at the Pumper and Cleaner Environmental Expo International, February 27-March 1, 2012, in Indianapolis, Indiana (booth #8164). For more information, visit www.peinemannequipment.com.

Flow International Introduces Mach 4c, Mach 2c and HyPlex® Prime

Flow International has launched the Mach 4c, the Mach 2c and the HyPlex® Prime. The Mach 4c is designed to optimize the production environment, the Mach 2c provides exceptional value, and the HyPlex Prime is the most advanced direct drive pump available.

The Mach 4c is the newest addition to the Mach 4 line of waterjets and offers a variety of features that are unique in the waterjet industry including an expandable modular design, up to 14 m (48 feet) in length, allowing customers to increase the size of the cutting area as their business grows. The system provides fast, accurate machine motion with zero backlash. The new Mach 4 is ergonomically designed to improve operator convenience and productivity with lighting to enhance work piece visibility, efficient abrasive removal, and easy access to material and parts with full four-sided accessibility.



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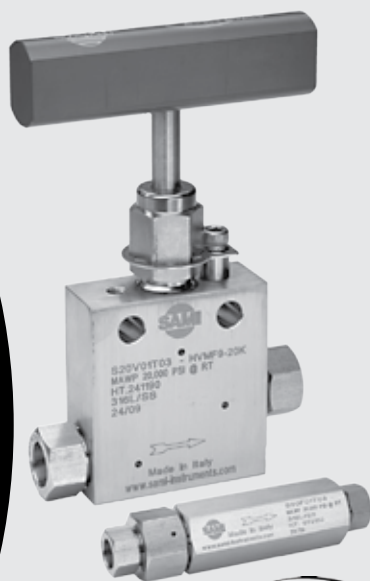
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Selecting the Most Effective Waterblast Pressure and Flow for a Given Standoff Distance,

Distance,

from page 6

performance relative to properties necessary to clean or remove a material, such as threshold pressure.

2. TEST METHOD

Blocks of machineable wax were traversed across in one pass by a single jet orifice with good upstream conditions produced by a straight rigid lance. Performance was measured by depth of cut produced. Tests were conducted first with increasing standoff distance and a fixed pressure supplied to the nozzle to determine the actual performance deterioration due to standoff distance. These tests were conducted at 248 MPa, 138 MPa, and 69 MPa (36,000 psi, 20,000 psi and 10,000 psi), at flow rates corresponding to powers of 50, 85 and 125 kW (70, 115 and 170 hp). The next series of tests were conducted at a standoff distance of 50 times the orifice diameter, and the pressure supplied to the same nozzle was reduced by the percentage according to the chart in Figure 1 (p. 6), at points corresponding to 250 diameters, 75 percent; 500 diameters, 60 percent; and 800 diameters, 46 percent.

Additional tests at a standoff distance of 50 diameters with reduced pressures were performed to determine the effect of constant flow rate and constant power, where the orifice size was increased to achieve either flow or power equivalent to the higher supply pressure condition.

3. RESULTS

3.1 Constant Orifice Diameter with Reduced Pressure

The results for the three pressure ranges tested are shown in Figures 2, 3 and 4, averaged for the powers tested. The curves show the actual performance as produced by deterioration due to standoff distance, and the performance of tests with the same nozzle orifice at comparably reduced pressures supplied to the nozzle. The results for 138 and 69 MPa (20,000 and 10,000 psi) show the same shape of curve but an effective performance about 25 percent less than that of the actual performance curve.

The results at 248 MPa (36,000 psi) do not show the same matching trend; this is likely due to the different orifice design used in these tests. The predicting curve used (Figure 1 - p. 6) was produced from results of a typical tapered carbide orifice, as was used for these tests at 138 and 69 MPa, while the tests at 248 MPa used a sapphire orifice. It is expected that this design shape

(continued on page 18)

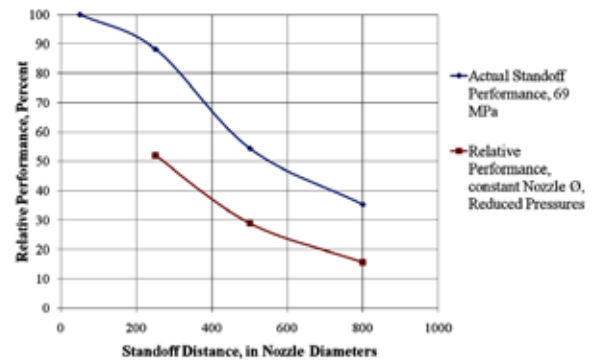


Figure 2. Reduced Pressure Performance vs. Actual Standoff Distance Performance 69 MPa (10,000 psi)

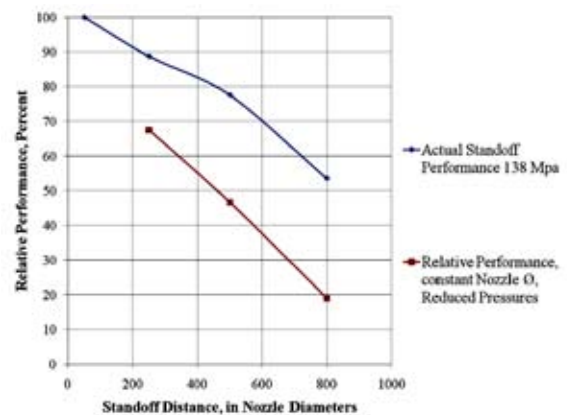


Figure 3. Reduced Pressure Performance vs. Actual Standoff Distance Performance 138 MPa (20,000 psi)

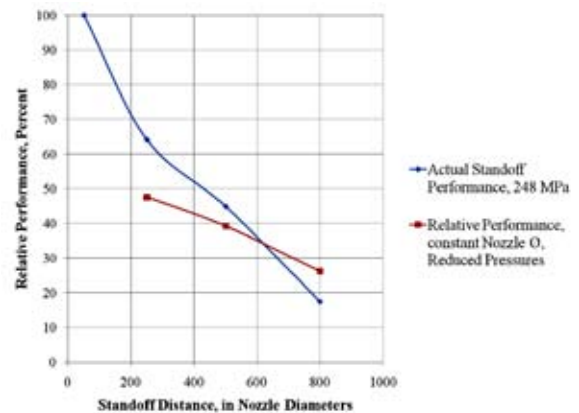


Figure 4. Reduced Pressure Performance vs. Actual Standoff Distance Performance 248 MPa (36,000 psi)

MultiCam® Creative Director Mark Allen Passes Away

Mark Allen, creative director for MultiCam® Inc., passed away on December 3, 2011, at age 50. The global CNC cutting system manufacturer's eight-year employee and talented artist lost his eight-month battle with lung cancer. During this time, he continued to produce amazing work including the 2011 MultiCam greeting card.

"All of us will miss Mark," says Director of Sales and Marketing John Harris. "He was a great team player, and his creative talent contributed significantly to both our corporate and Technology Center marketing programs."

Allen had over 25 years of graphic design experience. Before joining MultiCam in 2003, he worked on

Cingular®, Nokia®, 7-Eleven®, and MasterCard® interactive and eLearning projects at The Integer Group. For Superior Graphics, he designed Nortel® interactive trade show kiosks. He was an illustrator at the prestigious Johanson & Associates art studio, an animator at the Studios at Las Colinas, and a PressPass comic book illustrator.

At MultiCam, Allen designed the corporate website plus advertising and marketing materials. Samples of his work can be viewed on his website at www.markallen-interactive.net.

"Mark was a great talent who had a lasting impact on everyone's life that he touched," says President and General Manager Kris Hanchette. "His passion, dedication and commitment to MultiCam helped grow the compa-

ny to where we are today. Mark's ideas and creativity laid a solid foundation that will help with our continued success for many years to come."

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Selecting the Most Effective Waterblast Pressure and Flow for a Given Standoff Distance,

from page 16

would require a different deterioration curve for performance estimation.

3.2 Constant Flow Rate and Constant Power with Reduced Pressure

Since reducing the pressure supplied to a fixed orifice size results in reducing both the flow rate and the power, a series of tests was performed to determine if this accounted for the 25 percent difference. First, the orifice size used for the comparative tests was increased to produce an equal flow rate at the reduced pressure, and then increased to produce an equal power at the reduced pressure. The results of these tests are shown in Figure 5 (p. 21), relative to the actual deterioration curve. The slight increase in orifice size to produce equal flow rate did not

show significant change, while the increase to equal power did bring the comparative curve closer, to within 15 percent of the actual deterioration curve.

4. CONCLUSIONS

The results of these tests showed that there is a practical correlation between jet deterioration due to standoff distance and an estimation of performance based on a comparatively reduced pressure. When evaluating two systems of equal power, an estimation based on performance with increasing standoff distance would allow a relative comparison, as long as an appropriate deterioration curve based on orifice type was used. It should also be noted that these deterioration curves

will vary due to the effect of turbulent upstream conditions, as shown in Figure 6 (p. 21).

When the tests were performed using the same orifice size at reduced pressures, the results showed a 25 percent less effective performance; Figure 7 (p. 21) illustrates the results of adding this factor of 25 percent to the pressure, by shifting the comparative data points. It appears that if the estimated impact pressure value were increased by this factor, this method of prediction could be used to estimate effective impact relative to pressure, and allow evaluation of the ability to remove a material with a known threshold pressure at a given standoff distance.

(continued on page 21)



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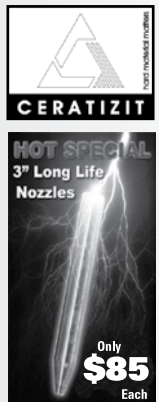


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Jet Edge Adding Waterjet Training Workshops at Shanghai, China Office in 2012

Jet Edge, Inc., is offering waterjet training and demonstration workshops at its Shanghai office and showroom. Workshops are scheduled from 9 a.m.-5 p.m. on Feb. 22-24 and again on June 18-20.

During the workshops, Jet Edge technical experts will demonstrate Jet Edge's 6200 bar X-Stream waterjet cutting technology and will provide basic operation and applications training on a Jet Edge precision waterjet cutting system. Topics will include: X-Stream 6200 bar waterjet cutting, precision cutting tips and techniques, mobile waterjet cutting, mobile surface preparation and blasting, hydro-demolition, and basic maintenance and repair of waterjet intensifier pumps.

To register, visit www.jetedge.com, call +86-21-5868 3678/2809 or e-mail sales@jetedge.com.

Managing the Plant Turnaround Squeeze,

from page 4

Expect the unexpected

"We'll go to the trouble of making a schedule, and then as soon as they open things up, we'll find things we didn't expect," Johnson says. "When this happens, we communicate three or four times per day so they know where we are and we know what they need," he says.

Sometimes, contractors make mistakes. "It's always better to tell the plant manager when it happens," Shepherd says. "It also builds trust. They understand that we're not robots. There are going to be mistakes. If you admit you caused a problem, it's a whole lot easier to solve than trying to cover it up."

Turnarounds are getting more complex, but contractors have stepped up. "You have to be prepared, make sure you have the right people and proper equipment, get to the site, and then be prepared for a change," Johnson says. ■

Photographs provided courtesy of Hydro-Klean LLC.

Article submitted by Federal Signal Environmental Solutions. For more information, visit www.waterblast.com or www.federalsignal.com.

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StoneAge Announces Dealer Changes and New Division

StoneAge has announced an expanded dealer model. As of January 2012, "StoneAge Tools" products will be offered for sale only through the StoneAge distribution network. The StoneAge Tools division will include waterblast tools and mechanized systems, Warthog sewer cleaning tools, and Spincat downhole cleaning tools.

"StoneAge's success is based on our innovation of new accessories for the waterblast and sewer industrial cleaning market. We plan to take our product development to the next level by increasing our focus on engineering, designing the next generation of waterblasting accessories," says Kerry Petranek, StoneAge's chief executive officer. "You can expect to see us release highly effective, low maintenance products such as the new Spitfire shotgun tool and the completely redesigned, state-of-the-art Sabertooth dual flex lance machine."

It is StoneAge's objective to have the most knowledgeable dealer network in the industry. Their dealers have committed to significantly increasing their stock of StoneAge products, completing an intensive factory training program, and attending continuing education training sessions yearly.

"It's our goal that our customers will receive even better, more regional support from our dealers," says Carrie Grant, StoneAge's director of dealer relations. "We are committed to growing our dealers so that they are an extension of us. We are known for our customer service, and we intend to only increase that service through our extensive network." To find an authorized StoneAge dealer, visit www.stoneagetools.com.

StoneAge continues to understand that having a direct relationship with the factory is very important.

"We intend to make sure that our customers have direct access to us, just as they always have," says Jeff Hensley, StoneAge's customer service manager. "It's our goal to continue to provide the best technical support in the industry. We encourage you to call our technical support team to ask questions about our tools, systems, and the tough cleaning applications you may have. We want you to call us! There is no one in the industry who has knowledge about accessories like StoneAge does, and it is our commitment to make sure that we are here as a technical resource for every one of our customers."

And there are still ways to work directly with the StoneAge factory. StoneAge is pleased to announce its newest division: StoneAge Solutions. StoneAge Solutions is the professional service side of StoneAge's business that will continue to work directly with contractors, plants and other end-users.

"If you require a custom system for a tough cleaning application, call us. If you have a tool that needs to be repaired or have ideas for new tools or tool improvements, call us. If you need us to provide technical training at your site, call us," says Bill Shires, director of business development and the head of the Solution division. "StoneAge Solutions will also be our field testing arm so we look forward to working with contractors and plants during the testing phase of new product development."

"We are very excited about these changes," continues Petranek. "Our roots are in product development and our future is in product development. By extending our world class service through our dealers we can reach more people around the world, advancing the industry through our knowledge and product innovation."

For more information, visit www.stoneagetools.com or call (970)259-2869.

Regional Sales Manager

Commercial Credit Group Inc., a commercial equipment finance company providing finance and lease solutions to companies in the liquid and solid waste industries, is seeking sales professionals for our Waste Division in the Southwest (TX, LA) and Midwest (IL, WI, MO, etc.). Duties would include establishing and maintaining relationships with manufacturers, vendors and end-users of equipment such as waterblasters, vacuum trucks, garbage trucks and roll-off trucks. Ideal candidate would have established contacts in the industry and knowledge of the equipment. Finance experience preferred but not required.

kmcginn@commercialcreditgroup.com

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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.

Selecting the Most Effective Waterblast Pressure and Flow for a Given Standoff Distance,

from page 18

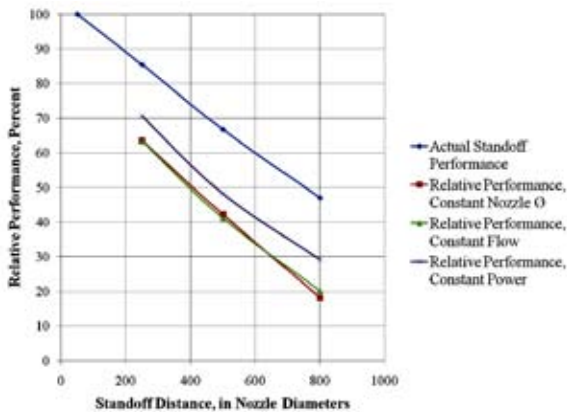


Figure 5. Reduced Pressure Performance vs. Actual Standoff Distance Performance Average of 69 MPa and 138 MPa

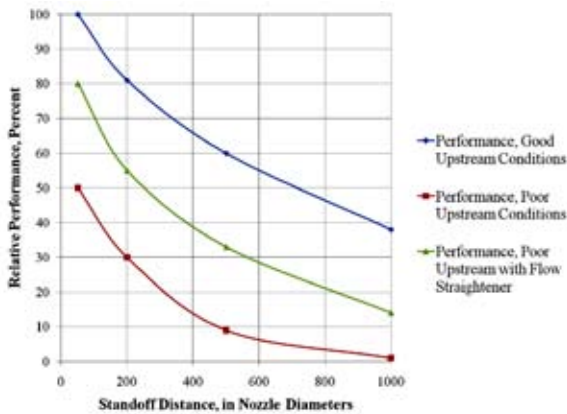


Figure 6. Effect of Upstream Conditions on Performance of a Tapered Carbide Nozzle

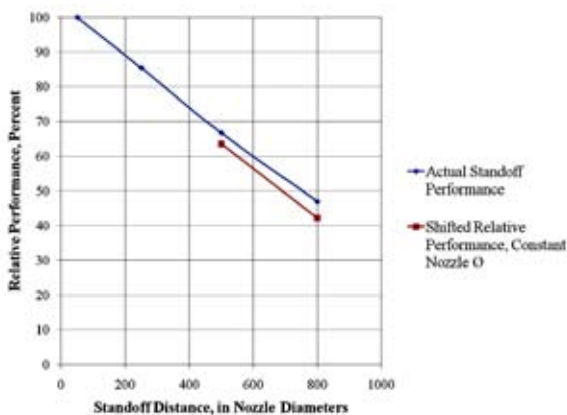


Figure 7. Reduced Pressure Performance Adjusted vs. Actual Standoff Distance Performance Average of 69 MPa and 138 MPa

The tests performed by increasing the orifice size to hold either the flow rate or the power constant showed some improvement toward the actual deterioration. However, since this still did not match the actual performance, and unless the perfect match is found, it would be simplest to base the prediction on decrease of pressure through the same nozzle and make the adjustment of 25 percent if desired.

Applying these findings to the example of the introduction, it would show that the 69 MPa (10,000 psi) system would produce a comparative impact of 59.5 MPa (8,625 psi), while the 138 MPa (20,000 psi) system would result in a comparative impact of 95 MPa (13,750 psi). By this type of comparison, it is the typical result to have the higher pressure system showing the greatest impact, with the difference narrowing with increasing standoff distance, and with this, the effect of the mass of the water must become more dominant. Finally, when comparing various systems of different pressure and flow capabilities, consideration must always be taken for how any given material responds to flow rate as well as to pressure. ■

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Hughes Pumps recently supplied a leading multi-national offshore contractor with a unique high pressure twin pump system for the flushing and pressure testing of subsea pipelines during pre-commissioning operations.

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installation where space is at a premium.

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Housed in a DNV (Det Norsk Veritas) certified offshore crashframe, the unit is suitable for use offshore in both freezing conditions and ambient temperatures up to 50°C (122°F). The structure of the crashframe was finished in a durable offshore paint with doors and end panels manufactured in 316 stainless steel, with overall dimensions of 5 m long x 1.6 m wide x 1.8 m high x 7,200 kg



(197 in. x 63 in. x 71 in. x 15,840 lb) – very compact for a 225 kW (300 hp) enclosed unit.

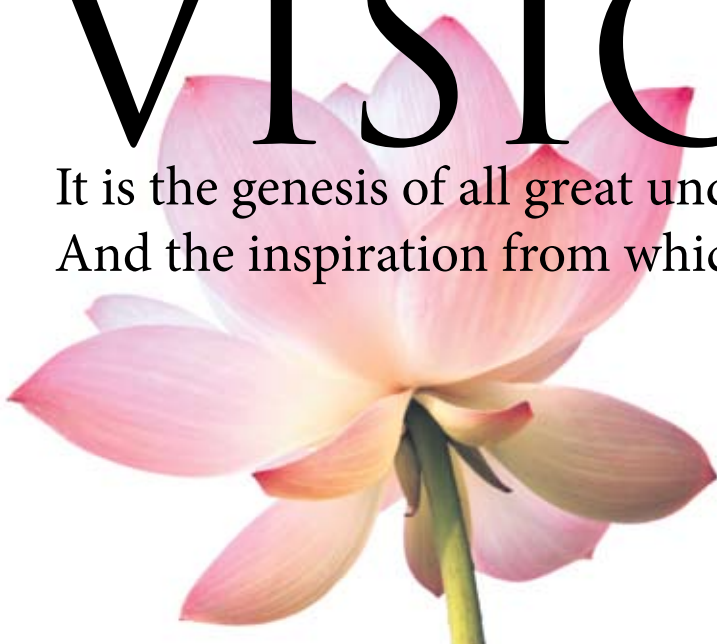
Hughes Pumps offers a standard range of pump units for conventional water blasting applications and specialized pumping equipment for the most demanding of industries.

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Australia's Metco Now Distributes Aquajet Hydrodemolition Equipment, from page 12

The lower the concrete strength, the larger the material removal rate that can be achieved due to larger penetration and pressurization of the material. Additionally, the higher the cement matrix strength, the higher the concrete resistance. This is due to the increased difference in the compressive strength of the construction and the penetration effect of the waterjet pressure, water volume and jet movement.

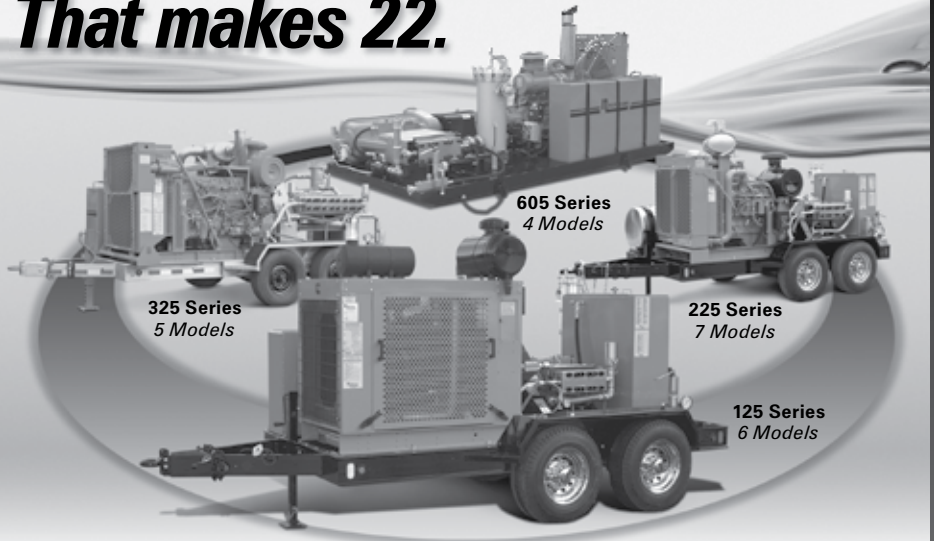
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With waterjet hydrodemolition, once programmed, the jet moves rapidly and continuously over the selected area for removal. There is no percussive effect on the surface with the waterjet penetrating the deteriorated concrete. Extensive investigations have proven that there is no modification of the concrete microstructure during the waterjet treatment. Similarly the concrete pore structure is not affected by the waterjet.

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The surface geometry achieved after hydrodemolition depends on the type and size of the aggregate. With limestone, for example, the surface is comparatively smooth and characterized by a high degree of fractured aggregate gains. In contrast, quartzite containing concrete exhibits an uneven surface and a high amount of undamaged aggregates.

Compared with other removal methods, hydrodemolition generates a very large contact surface between the concrete and applied coating system.

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Mercado Machinery Distributing Jet Edge Waterjets in Mexico



Mercado Machinery is now distributing Jet Edge precision waterjet cutting systems in Mexico. The machine tool distributor has sales offices in Mexico City, Monterrey, and Guadalajara.

Mercado Machinery carries Jet Edge's full line of precision waterjet cutting equipment, including waterjet cutting machines and waterjet pumps. Jet Edge manufactures a wide range of waterjet cutting systems, from 30 inches x 30 inches to 30 feet x 100 feet, and offers a wide range of intensifier pumps, including 36 ksi, 60 ksi and 90 ksi pumps, 30-280 hp, electric and diesel.

"We are very pleased to introduce Mercado Machinery as our new distributor for Mexico," says Jude Lague, Jet Edge president. "Mercado shares our commitment to outstanding customer service. Their experienced sales and technical staff know the metalworking industry and can help our customers select the best machine for their application."

For more information about Mercado Machinery, visit mercadomachinery.com/hydra.html or call (55)5567-2321 (Mexico City), (33)3121-8829 (Guadalajara), or 01 (800)837-3001 (Monterrey). For more information about Jet Edge, visit www.jetedge.com or call (800)538-3343.

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.

Used Waterjet Cutting Equipment Posted on Jet Edge Website

Jet Edge, Inc., is now posting used waterjet equipment for sale on its website. Jet Edge's used waterjet equipment inventory includes ultra-high pressure waterjet intensifier pumps, waterjet motion systems, waterjet parts and accessories, and mobile waterjet cleaning and cutting equipment. Jet Edge's waterjet intensifier pumps feature a reliable tie-rod design. Many Jet Edge customers have more than 30,000-40,000 hours on waterjet pumps that are still going strong.

For more information, visit www.jetedge.com, call (800)538-3343 or e-mail sales@jetedge.com. Follow Jet Edge on Twitter @Jetedge to be among the first to find out about used waterjet equipment as it becomes available.

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TECHNI Waterjet-ANCA Partnership Consolidates Industry Leadership

TECHNI Waterjet's reputation as a technology leader in the waterjet cutting industry has received a major boost with the signing of the ANCA Group as their new equity partner.

Darren Reukers, managing director of TECHNI Waterjet says, "ANCA will take a 25% share in TECHNI over the next two years with options to develop a closer partnership in the future."

"The strategic alliance builds on TECHNI's ability to provide leading edge technology as well as the capital to significantly increase production and meet rapidly growing demand for products like the new Quantum ESP™ electric servo pump," Mr. Reukers says.

Mr. Reukers adds that the choice of partner was an obvious one given the long standing relationship and synergies that already exist between the two companies.

ANCA is a world leader in developing CNC technology, and is one of the largest and most respected CNC grinding machine manufacturers. Established in 1974, the ANCA group is a global company with sales, service and applications resources located around the world, and manufacturing plants in three countries.

"The backing of the ANCA group as a global machine tool manufacturer will also help to grow the business, enhance the wider recognition of our products and strengthen and protect our unique Intellectual Property (IP) portfolio," Mr. Reukers says.

Grant Anderson, CEO of the ANCA Group says, "We see our investment in TECHNI Waterjet and their technology as a key strategic decision, which will strengthen and broaden our market, and extend an already mutually beneficial relationship."

The partnership also enhances TECHNI's presence and support services in the key markets of the USA and Europe, and provides opportunity and capacity to enter new and emerging markets in Latin America and Asia.

Mr. Reukers says, "We have worked together in developing the core software for both the Quantum ESP™, and the PAC-60™ Bevel Cutting Head. This means that we already understand the technology and each other, and shows that we can work together successfully to deliver better outcomes for our customers."

"Our customers can be reassured that TECHNI will continue to apply its strict quality controls and dedication to customer support while being able to meet the needs of higher volume customers."

Co-founded by Mr. Reukers and Glenn Langdon, TECHNI began manufacturing waterjet systems in the early 1990's, and has released new and innovative products continually. Industry firsts include: Break Away Head, Tech-Sense™ Abrasive Monitoring System, Linear Encoder Feedback, PAC-60™ Bevel Cutting Head, Ezy-Load™ Glass Lifters, Non-contact Garnet Pump and Hopper, Mobile Phone Communications System, Automatic Kerf Compensation, and the Quantum ESP™.

"Today we are a multi-award winning company, recognized for our innovation, leadership and customer support. The ANCA partnership is an important next step that will provide many flow on benefits to ANCA, TECHNI, our customers, our suppliers, and our staff," Mr. Reukers says.

For more information, visit www.techniwaterjet.com or call (913)492-3700.



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Dave Bell

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 Houston, TX 77061
 Phone: (713)675-8586
 Fax: (713)454-1596
 Email: blake.merry@pcg.com

Richard Padilla

Jetstream of Houston, LLP
 5905 Thomas Road
 Houston, TX 77041-4904
 Phone: (832)590-1300
 Fax: (832)590-1304
 Email: rpadilla@waterblast.com

Individuals

Joshua All

C&K Industrial Services
 6391 State Road 42
 Terre Haute, IN 47803
 Phone: (812)244-0600
 Fax: (812)244-0699
 Email: jall@ckindustrial.com

Ramesh N Babu, Ph.D.

Indian Institute of Technology
 Madras
 Manufacturing Engineering
 Section
 Department of Mechanical
 Engineering
 Madras, Tamil Nadu 600 036
 India
 Phone: [91](44)22574675
 Fax: [91](44)22574652
 Email: nrbabu@iitm.ac.in

Francisco Soto del Rivero

Limpieza Industrial de Sureste
 Alvaro Obregon 1127-B Col.
 Benito Juarez Noerte
 Coatzacoalcos, Veracruz 96576
 Mexico
 Phone: [921](21)43256
 Email: linsur_sa@hotmail.com

Dave A Donlon

Standard Equipment
 2033 W. Walnut
 Chicago, IL 60612
 Phone: (312)706-9687
 Fax: (312)829-6142
 Email: ddonlon@standardequipment.com

Individuals

Ravindra Kumar

Arabian German Pump
 P.O. Box 73268, Abudhabi
 Abu Dhabi 73268
 United Arab Emirates
 Phone: [971]504577867
 Fax: [971]25515913
 Email: ravi_499@hotmail.com

Keith Lemmer

LAI International, Inc.
 1110 Business Parkway S
 Westminster, MD 21157-3065
 Phone: (410)857-0770
 Fax: (410)857-0774
 Email: klemmer@laico.com

Sean Murphy

Team Industrial Services
 25 Bodrington Court
 Markham, Ontario L6G 1B6
 Canada
 Phone: (905)940-9334
 Email: seanmurphy@teamindustrial.com

Troy Niloff

K.M. Plant Services
 2552 Industrial Drive
 Highland, IN 46322
 Phone: (219)712-9972
 Email: troyniloff@k2industrial.com

Henning Peters, Dr.-Ing.

Hochdruck-Systeme GMBH
 Am Muhlfeld 9
 Sigless A-7032
 Austria
 Phone: [43](26)2671769
 Fax: [43](26)2671808
 Email: hds@hochdruck-systeme.at

Michael Pickering

North American Industrial
 Services
 1240 Saratoga Road
 Ballston Spa, NY 12020
 Phone: 518-885-1820
 Email: mpickering@naisinc.com

Donald Roy

Clean Harbors
 40B Carey Circle
 Hampden, ME 04444
 Phone: (207)262-9504
 Email: roy.donald@cleanharbors.com

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Willie Bloom at VLN Tech

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

Debbie Carrington at BHR

Email: dcarrington@bhrgroup.co.uk
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