WJTA WaterJet Technology Association

Jet News

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IMCA Industrial & Municipal Cleaning Association

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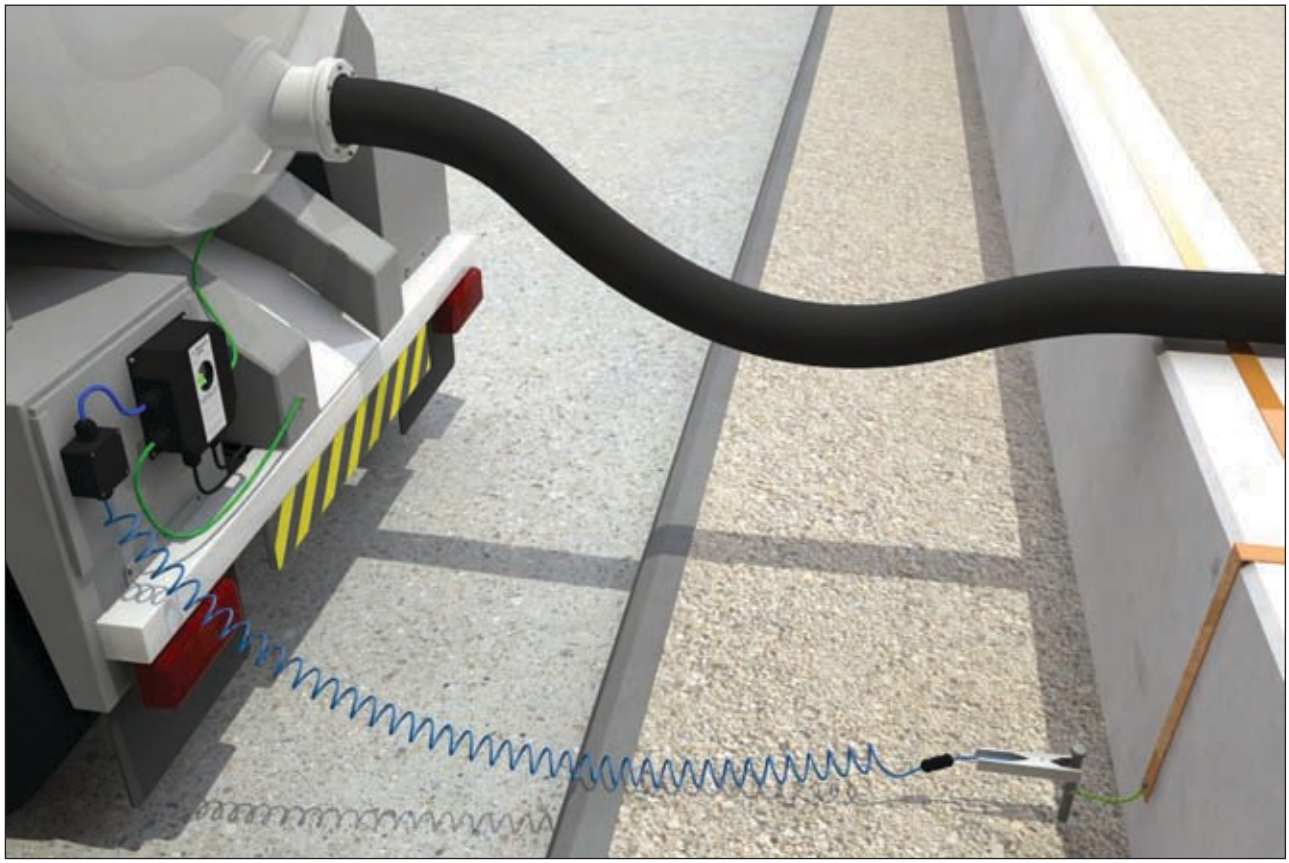
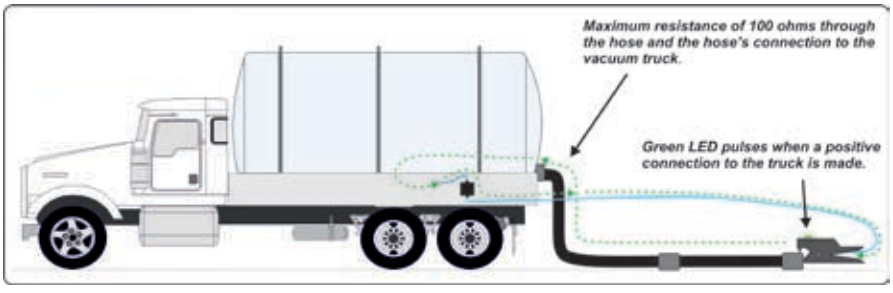
Static Electricity on Hoses - Causes, Hazards and Prevention



Vacuum trucks and their hoses can generate enough static electricity to ignite combustible atmospheres. Providing a verified ground connection for a truck with a system like an "Earth-Rite® MGV" ensures static electricity will not be an ignition risk. Although a truck may be grounded, breaks in the electrical continuity of hoses are common and may lead to static electricity discharging from the hose itself. *See article on page 2.*



Breaks in hose electrical continuity can be detected with a device like an OhmGuard® hose continuity tester from Newson Gale Inc. The driver simply connects the number of hoses required and then connects the OhmGuard clamp to the free end of the final hose. If the hose is safe to use, the green LED in the OhmGuard clamp will pulse continuously.

Static Electricity on Hoses - Causes, Hazards and Prevention

Discharges of static electricity from hoses are known to cause the ignition of combustible atmospheres during the transfer of material to or from vacuum trucks and tanker trucks.

There are normally three main reasons why discharges of static electricity from hoses can occur. One reason is that non-conductive hoses are used to transfer material. Non-conductive hoses are capable of accumulating and retaining high levels of static charge, which can result in incendive brush discharges from the hose itself, or the charging of isolated conductive objects attached to the hose like a nozzle or coupling that can discharge a spark themselves. It is generally accepted practice within the hazardous process industries that non-conductive hoses should not be used to transfer potentially combustible liquids and powders and numerous standards and industry association publications repeat this recommendation.

Another common reason for static spark discharges from hoses results from connecting conductive hose, or interconnected conductive hose sections, to a vacuum truck or tanker truck that does not have a verified static ground connection. The third most common reason for static spark discharges from hoses is where the conductive components of the hose structure become isolated during normal activity.

Figure 1. Four hose sections joined together in a vacuum truck operation with an OhmGuard® hose tester testing the first hose section (blue cable).

Both the second and third modes of electrostatic discharge are the most relevant to the hazardous process industries, and are scenarios where improper use of conductive hoses can lead to the accumulation and discharging of static electricity within a combustible atmosphere.

1.1 Conductive hoses connected to ungrounded vacuum trucks and tanker trucks.

With no static grounding protection in place a truck conducting a vacuuming or loading operation will become electrostatically charged as it has no means of preventing the accumulation of static electricity on its tank and chassis. Because the metal connections (couplings) of the hose should be electrically continuous with the truck, the truck will also transfer charges to the hose, thereby causing the accumulation of static electricity on the hose as well. The quantity of charge transferred to the hose will be high as ungrounded trucks can build up very large electrostatic voltages in a short space of time.

Charge accumulation on the conductive metal components of the hose, like couplings or nozzles, are a particular concern as these are the parts most likely to be closest to any combustible vapors or dusts during operations and may seek to nullify their electrical imbalance by sparking onto objects like operators, tank walls or pipes. If a combustible atmosphere is present in the spark discharge gap, ignition of the atmosphere is highly probable.

In one reported incident a vacuum truck was sucking off-specification toluene from a below grade sump and, although the hose was conductive, the truck to which it was attached did not have a verified static ground connection. The hose itself consisted of a metal wire helix embedded in the hose tubing which bonded the hose couplings, but given the high level of voltage induced on the hose via the ungrounded truck, a static spark was discharged from the metal wire helix of the hose across the hose tubing and onto the metal rim of the sump. The resulting spark ignited the toluene vapors leading to a fire [1].

1.2 Damaged conductive hoses connected to grounded vacuum trucks and tanker trucks.

A more insidious hazard is situations where the tanker truck has a static ground connection that is verified

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On the inside

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Aquajet's Aqua Cutter Strips Decayed Concrete on Haifa Pier

Specialist marine contractor Maagan Marine & Diving Works Ltd. is using hydrodemolition techniques to remove decayed concrete from the East Pier at the Port of Haifa, during a three-year project to rebuild the pier, with a new Aqua Cutter 710V evolution from Sweden's Aquajet Systems AB.

Compared with traditional operations using jackhammers, the Aqua Cutter 710V, is able to replace between four and five hammers during a single shift, and also leaves a cleaner finish on the rebar of the pier, which is being left in situ for the reconstruction.

Maagan Marine's chief executive officer Avi Ben-David says that no jackhammers are being used and that the Aqua Cutter has increased accuracy and productivity while reducing manpower and the risk of 'white finger' from vibration for the operators.

"We consider ourselves an innovative company, and we always seek to find, incorporate, and deploy new technologies which allow us not just to meet our goals, but to exceed them," he says.

"We have found the Aqua Cutter robot a good solution both to the project requirements and to the tight schedule, and it has allowed us to reduce the planned timeframe."

Maagan Marine, which was formed in 1987 and is based in Haifa, employs more than 60 personnel, including engineers, divers, construction workers and heavy equipment operators, and works in the sectors of marine and port construction, diving works and salvage, dredging and excavation, and environmental protection.

The Aqua Cutter 710V is the first hydrodemolition robot to be used in Israel by Maagan and was delivered during the project organization stage.

The Port of Haifa is the second largest of Israel's three major international seaports, a natural deepwater harbor that operates all year long, serving both passenger and merchant shipping. It is one of the largest ports in the eastern Mediterranean in terms of freight volume and handles over 22 million tons of cargo each year.

The East Pier was originally built in 1979 to a length of 686.5 m. During 1994, due to high levels of corrosion, the pier was treated with epoxy paint and was extended by 277.5 m, taking it to a length of 964 m.

With a height of 2.7 m, the approximate working area for Maagan Marine is 2,602.8 m².

"Due to the age of the pier, and the wear and tear it has undergone, the condition of the concrete was deteriorating to the point that the rebar was showing through in some places," says Mr. David.

"The Port Authority decided on a renovation of the pier, and we were contracted to remove the old concrete and undertake the renovation.

"The removal of the old concrete requires some precise removal work, because the rebar itself is still in good condition and will form the basis of the new construction and concrete work."

The tidal level at the pier is around ±0.5 m, but as the pier was initially built at maximum tidal level, there is no underwater work involved.

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Static Electricity on Hoses - Causes, Hazards and Prevention, from page 2

with either a truck mounted or rack mounted grounding system, but the hose connected to the truck has lost its electrical continuity resulting in the isolation of a metal component somewhere in its structure. A typical example of this would be when the metal wire helix of the hose becomes isolated from an end fitting like a hose coupling or a nozzle.

Metal wire helixes are commonly used to reinforce the hose structure against transfer pressures and bending kinks. Another function of metal wire helixes is to bond end fittings to provide the necessary end-to-end electrical continuity that will prevent the accumulation of static electricity on the hose. If the metal helix, through normal industrial "wear and tear," breaks or detaches from hose couplings or nozzles, these components now have the capacity to accumulate enough charge and enough energy to ignite a combustible atmosphere. If a hose section with an isolated coupling is fitted between other hose sections, the other sections are isolated from the grounded truck also which could lead to multiple components coming electrostatically charged near to, or within, the potentially combustible atmosphere. In this situation the isolated hose sections will become charged due to contact with the moving liquid or powder.

Another important consideration is hoses fitted with two metal wire helixes, where one helix is present on the outer surface of the hose and a second helix is present on the inner surface of the hose. In some hose designs the inner helixes are not bonded to the hose end fittings and it is important to ensure that such helixes cannot discharge sparks onto the end fittings or opera-

Figure 2: Example of a truck mounted (Earth-Rite® MGV) static ground verification system.

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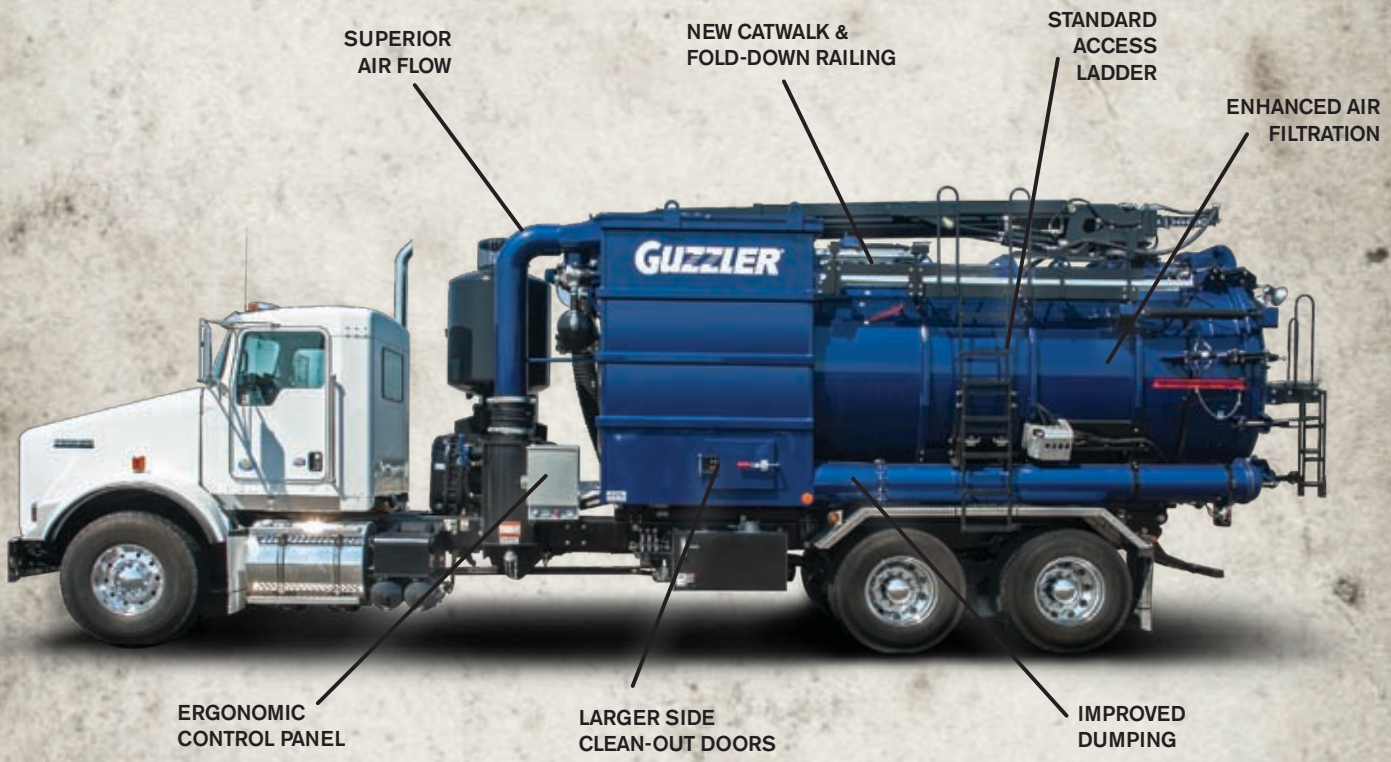
WE JUST COULDN'T LEAVE RELIABILITY ALONE.



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Waterjet Safety Alert

WJTA-IMCA was informed of an incident involving a waterjet injury to a worker's hand. The worker was attempting to clean the nozzle of a gun and the gun engaged when it was set down, injecting water into the worker's hand. The worker was given prompt medical attention and surgical treatment and was able to return to limited duty the next day.

The WJTA-IMCA *Recommended Practices for the Use of High Pressure Waterjetting Equipment* makes the following safety recommendations: Equipment shall not be repaired, or connections tightened, when the unit is in operation or the pump running. High pressure waterjet systems shall be depressurized when replacement or repairs are made to the system. A person injured by being hit with a waterjet will not necessarily see the full extent of the injury, particularly the internal damage and depth of penetration. Medical attention shall be sought for all waterjet injuries regardless of external appearance.

Refer to the WJTA-IMCA *Recommended Practices for the Use of High Pressure Waterjetting Equipment* for more safety recommendations. To order, visit www.wjta.org, email: wjta-imca@wjta.org, or call: 314/241-1445.

Static Electricity on Hoses - Causes, Hazards and Prevention, from page 6

tor, especially when the hose is removed at the end of a transfer operation when a combustible atmosphere may be present in the hose or the area surrounding the hose. A hose fitted with an internal metal wire helix caused a fire through a discharge of static electricity, and in addition to the wire helix being broken, both end couplings were not designed to be connected to the inner metal helix. Quoting from **"Avoiding Static Ignition Hazards in Chemical Operations,"** AIChE/CCPS, Britton, L.G., 1999:

> *"A fire was reported during draining of toluene from a road tanker through such a hose and after the event it was found that the inner spiral was not only broken but was not designed to be bonded to the end connectors. Two post loading toluene fires occurred with a similar hose as the disconnected hoses were being handled by operators."*

2.0 Industry standards and recommended practice.

To ensure that the hoses used on vacuum trucks and road tanker trucks are not an electrostatic ignition source in a hazardous area there are numerous standards and recommended practices that describe the required electrical continuity of hoses. However, owing to the various hose construction types and established industry sector "norms," there are a range of electrical continuity values that preclude a "one size fits all" approach to ensuring a hose is safe to use in a potentially combustible atmosphere.

By far, the most common type of hose used on vacuum trucks and tanker trucks are hoses that contain metal wire helixes that may be sandwiched between layers of hose tubing or may be present on the inner or outer surface of the hose, or both.

The following table lists several standards and industry association publications that outline the conductivity requirements for hoses. The respective recommended values of hose resistance are derived for an equivalent 25 ft. length of hose.

In reality, many companies specify their own internal inspection regimen that requires periodic end-to-end electrical continuity testing of their hoses. Periodic testing is normally performed every 6 to 12 weeks by a trained technician who will use a multimeter to measure and record the test results. The normally accepted end-

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Candidates Sought for 2013 WJTA-IMCA Awards

You are invited to submit candidates for the special awards presented by the WJTA-IMCA to honor a company, organization, or individual who has made a significant contribution to the industry through accomplishments that directly enhance waterjet technology and/or industrial cleaning. A list of previous WJTA-IMCA award recipients appears on the right.

Award recipient(s) will be selected by the WJTA-IMCA Awards Committee and honored at a presentation ceremony on Tuesday, September 10, 2013, in conjunction with the 2013 WJTA-IMCA Conference and Expo in Houston, Texas.

Candidate nominations must be received **NO LATER THAN JULY 15, 2013.**

Process for submitting nominees for awards:

- An official form for candidate nominations appears on page 12. Complete one form for each nomination submitted. Make additional copies of the form as needed.
- Attach a narrative **and** biographical sketch to support each nominee.
- Return completed forms and supporting documentation to the WJTA-IMCA by email: wjta-imca@wjta.org, fax: (314)241-1449, or mail: WJTA-IMCA, 906 Olive Street, Suite 1200, Saint Louis, MO 63101-1448, USA.

Previous Award Recipients

1981 Pioneer Award — Jacob Frank

1983 Pioneer Award — H.D Stephens

1985 Pioneer Award — William Cooley, D.Sc.

1987 Pioneer Award — Norman Franz, Ph.D.

1989 Pioneer Award — Richard Paseman

1991 Pioneer Award — John H. Olsen, Ph.D.

1993 Pioneer Award — Fun-Den Wang, Ph.D.,
Safety Award — David Summers, Ph.D., NLB Corporation
Service Award — George A. Savanick, Ph.D., Mohan Vijay, Ph.D.
Technology Award — Mohamed Hashish, Ph.D., Autoclave Engineers Hammelmann Corporation

1995 Pioneer Award — George Rankin
Safety Award — Autoclave Engineers
Service Award — Thomas J. Labus
Technology Award — Thomas J. Kim, Ph.D.

1997 Pioneer Award — David A. Summers, Ph.D.
Service Award — Andrew F. Conn, Ph.D.
Technology Award — Prof. Dr-Ing. Hartmut Louis

1999 Pioneer Award — Mohamed Hashish, Ph.D.
Safety Award — Bruce Wood
Service Award — John Wolgamott
Technology Award — Ryoji Kobayashi, Ph.D.

2001 Pioneer Award — George A. Savanick, Ph.D.
Technology Award — Richard Ward

2003 Pioneer Award — Pat DeBusk
Service Award — Mohamed Hashish, Ph.D.
Technology Award — Ernest S. Geskin, Ph.D.

2005 Pioneer Award — Hartmut Louis, Dr.-Ing.
Safety Award — TurtleSkin WaterArmor
Service Award — NLB Corporation
Technology Award — Jay Zeng, Ph.D.

2007 Pioneer Award — Forrest Shook
Safety Award — Vacuum Equipment Safety Committee
Service Award — Tony Fuller, Jim Petillo
Technology Award — Mamidala Ramulu, Ph.D.

2009 Pioneer Award — John Wolgamott
Safety Award — Gary W. Toothe, Philip Stein
Service Award — Bill McClister
Technology Award — Seiji Shimizu, Ph.D.

2011 Pioneer Award — Bill McClister
Technology Award — Jerry Zink

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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2013 WJTA-IMCA Awards Nomination Form

Instructions: Complete sections below and submit a narrative (300-word maximum) and biographical sketch to support your nomination on a separate sheet of paper. Please print or type all information.

I nominate the following **company, organization, or person as a candidate** to receive a 2013 WJTA-IMCA Award (please print or type full individual, company, or organization name):_____

❑ Distinguished Pioneer Award

The nominee must:

- Have made contributions to the waterjet and/or industrial cleaning industries
- Have made contributions to the achievement of the goals of WJTA-IMCA
- Have high moral character
- Have strong personal and business ethics
- Be dedicated to the future of the waterjet and/or industrial cleaning industries and to the growth of WJTA-IMCA

❑ Service Award

How has the nominated company, organization, or individual contributed in time and talent toward improvement in the industry or in the WJTA-IMCA?

❑ Technology Award

What has the nominated company, organization, or individual done to introduce new and innovative ideas in engineering or manufacturing? This could include, but is not limited to, new products, new manufacturing techniques, patents…any unique activity that advanced the technology of the waterjet and/or industrial cleaning industries.

❑ Safety Award

What has the nominated company, organization, or individual done to introduce new and innovative ideas in safety? This could include, but is not limited to new products, new concepts, new safety techniques…any unique activity that increases the overall safety of waterjet and/or industrial cleaning equipment.

CANDIDATE _____ Company _____

Address _____ City _____

State _____ Country _____ Postal Code _____

Phone In US/Canada (_____) _____ Fax (_____)_____
area code area code

Phone Outside US/Canada [_____] (_____)_____ Fax [_____] (_____)_____
country code city code country code city code

CANDIDATE SUBMITTED BY_____ Company_____

Address _____ City _____

State _____ Country _____ Postal Code _____

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Phone Outside US/Canada [_____] (_____)_____ Fax [_____] (_____)_____
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Nominations must be received no later than August 1, 2013.

For a prompt response, fax completed form to (314)241-1449, or mail to the WJTA-IMCA, 906 Olive Street, Suite 1200, St. Louis, MO 63101-1448, USA.

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Call for Nominations – 2013 WJTA-IMCA Board of Directors

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

The terms of office of **Kay Doheny, Jack Doheny, Inc.; Bill Gaff, Vacuum Truck Rentals, LLC; Mohamed Hashish, Ph.D., Flow International Corporation; Hugh Miller, Ph.D., Colorado School of Mines; Gary Noto;** and **George Savanick, Ph.D., Consultant;** will expire on September 7, 2013. In addition, Pat DeBusk's resignation from the board has resulted in a seventh open position.

NOTE: The Board of Directors, at their September 10, 2012, meeting, appointed Bill McClister to temporarily fill the vacancy brought about by Pat DeBusk's resignation. Bill McClister will fill the vacancy until September 7, 2013.

Nominations are sought for seven (7) board members. Six (6) board members will be elected to serve a four-year term of office beginning September 8, 2013. The candidate receiving the seventh highest number of votes will be elected to complete

(continued on page 24)

Nominations/Elections Procedures

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

- At least two calls for nominations to the Board of Directors will be published in the *Jet News*. The first call for nominations appears in this issue. **Nominations will be accepted through March 31, 2013.**
- An official ballot listing the eligible nominees and a brief biographical sketch for each individual will be forwarded by mail on **June 10, 2013,** to all eligible voting members of the WJTA-IMCA. Signed and executed ballots must be forwarded to the Association's office for tallying no later than **July 15, 2013.**
- The names of newly elected board members will be announced on the WJTA-IMCA website and in *Jet News*.

Only WJTA-IMCA members in good standing (2012 membership dues paid) may submit a nomination(s). A nominee who has not paid her/his dues by March 31, 2013, shall be declared ineligible to run for office in the 2013 election.

Nomination Form

Name of Nominee _____

Title _____

Address _____

City _____ State _____

Country _____ Postal Code _____

Telephone _____ Fax _____

Email _____

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

Name of Nominator _____

Title _____

Address _____

City _____ State _____

Country _____ Postal Code _____

Telephone _____ Fax _____

Email _____

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

WJTA-IMCA Conference and Expo

Preliminary Schedule of Events

Monday, September 9, 2013

8:00 a.m.-4:30 p.m.
Pre-conference Seminar - Basics and Beyond

Tuesday, September 10, 2013

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

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

8:00 a.m.-5:00 p.m.
Boot Camp Sessions

10:30 a.m.-5:00 p.m.
Emerging Technology, New Applications – Papers

5:00 p.m.-7:00 p.m.
Industry Appreciation Reception and Awards Ceremony

Wednesday, September 11, 2013

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

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

10:30 a.m.-1:00 p.m.
Emerging Technology, New Applications – Papers

As of 12-1-12

WJTA-IMCA Administration

to-end resistance "PASS" benchmark for individual hose sections with metal helixes is 10 ohms or less. Depending on the test results the technician will either allow the hose back into service, schedule the hose for a repair or remove the hose from service altogether. Quoting from section **5.5.5 of CLC/TR: 50504 (ref. Table 1)**:

"Due to broken bonding wires or faulty construction, it is possible for one or more of the conductive components of the hose (i.e. end couplings, reinforcing helices and sheaths) to become electrically insulated. If a low conductivity liquid is then passed through the hose these components could accumulate an electrostatic charge leading to incendive sparks. Therefore, the electrical continuity of the hose should be checked regularly. Care should be taken to ensure

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Figure 3 . An isolated coupling caused by a broken wire helix.

Table 1: Standards and industry publications that address hazards related to electrostatic charging of hoses.

Standard / Publication	Recommendation	Equivalent max. resistance per 25 ft. section of hose
ISO 8031: "Rubber and plastic hoses and hose assemblies - determination of electrical resistance and conductivity"	100 ohms per assembly (hose section) for hose with metal helix.	100 ohms
API 2219 "Safe Operation of Vacuum Trucks in Petroleum Service."	1×10^6 ohms per 100 ft. of hose.	250 K ohms
CLC/TR: 50404 "Electrostatics - Code of Practice for the Avoidance of Hazards due to Static Electricity"	1000 ohms per metre of hose.	7600 ohms
API 2003: "Protection Against Ignitions Arising out of Static, Lightning and Stray Currents"	*For vacuum truck operations*: "use conductive hose and fittings as per API 2219"..."special considerations and controls are required to ensure bonding integrity is maintained in this difficult environment and that there are no ungrounded conductive objects connected to the hose."	As per API 2219 (see above)
NFPA 77 "Recommended Practice on Static Electricity"	Resistance to ground 10 ohms or less for continuous metal hose. Resistance to ground of not more than 1000 ohms per metre for braided hose or hose with continuous metal wire. Resistance to ground of semi-conductive hose with current limiting design 1×10^3 ohms to 1×10^5 ohms per metre.	10 ohms 7600 ohms 7600 ohms - 762 K ohms
AIChE/CCPS: "Avoiding Static Ignition Hazards in Chemical Operations	"Conductive hoses containing a continuous wire or braid bonding element should have a resistance less than ≤1000 Ohm per metre of hose length"	7600 ohms
EN 13765: 2010 "Thermoplastic multi-layer (nonvulcanized) hoses and hose assemblies for the transfer of hydrocarbons, solvents and chemicals."	"There shall be electrical continuity between both internal and external wires and the end fittings." "For hoses equal to or greater than 50 mm in diameter the resistance should be ≤1 ohm per metre."	7.6 ohms

Peinemann Introduces New Heat Exchanger Cleaning Tool

Peinemann Equipment has introduced the outside bundle cleaners OBC-XL and OBC-B to its fleet of heat exchanger cleaning tools. The Peinemann OBC-XL and OBC-B come with the option of a hydraulically driven rotating nozzle head.

The distance between the two nozzles combined with the rotating effect creates a cleaned path that is hard to achieve any other way. There are only two jets, and more cleaning power is given to each nozzle to penetrate deeper into the exchanger. The volume of water at the right pressure has always been the best formula for effective bundle cleaning results. This applies for both inside and outside cleaning. Outside cleaning is often seen as less important even though considerable results can be achieved.

The other effect of the rotating nozzle head is a so-called vibration of the tube bundle, which helps the cleaning effect even more. The nozzles can be positioned horizontally and vertically and can even be turned at an angle to clean the front and back tube sheet at full pressure and flow.

For more information, email wout.bol@peinemann.nl or visit www.peinemannequipment.com.

Dues Increase for International Members

WJTA-IMCA announces a dues increase, effective 2013, for international members: $500 Corporate, $100 Individual, and $75 Corporate Individual. This increase is intended solely to offset increasing postage costs to international destinations.

WJTA-IMCA has continued to grow, remaining healthy and financially strong, with only two dues increases since its inception 30 years ago. We greatly value the continuing support of all of our members. If you have any questions about membership dues please contact the WJTA-IMCA administrative office.

Aquajet's Aqua Cutter Strips Decayed Concrete on Haifa Pier, from page 4

Mr. David says that the hydrodemolition operation takes place for between six and seven hours per day, six days per week, and this will be consistent for the duration of the whole project, which was originally set for a three-year period but will be significantly reduced, thanks to the Aquajet Aqua Cutter.

"A typical shift is about 10 hours, and we are using the robot for two-thirds of this time," he says.

"We are handling an area of about 8 m² per shift, to a working depth of 17 cm, and had we been using jackhammers we would have needed four or five of them working simultaneously to achieve this kind of progress.

"Our operators are also very happy with the machine, they are very positive indeed with using the robot and they are highly pleased with the quality of the work they are delivering."

The Aqua Cutter 710V evolution has the flexibility of cutting head to execute all possible operations, and the operator with the remote control is able to reach all areas and send the robot into confined areas.

Equipped on this project with a hydraulically operated extension kit, the machine does not carry any towers or have any protruding arms.

Mr. David says that the concrete being worked on is type B40, with the existing rebar within the pier of type ST-37.

"The existing rebar was found to be in good condition and therefore it will not be replaced," says Mr. David.

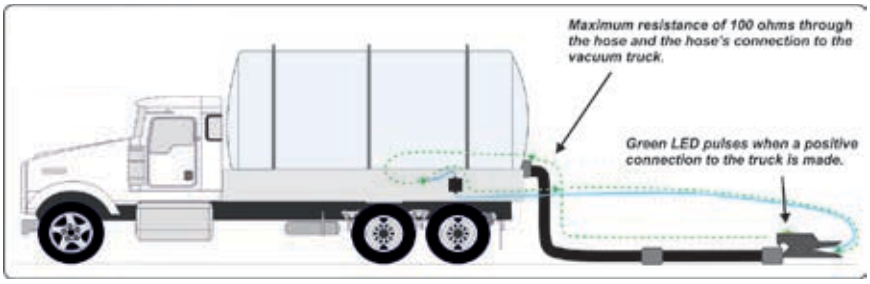
The original plan had considered using jackhammers to remove concrete from local areas, but the Aqua Cutter proved itself adept in both small, tight areas and in the larger areas.

"Using the Aqua Cutter robot has helped us very much both in terms of carrying the project and in furthering our reputation as an innovative company," says Mr. David.

For more information, email: aquajet@aquajet.se or visit www.aquajet.se.

Static Electricity on Hoses - Causes, Hazards and Prevention, from page 16

that all internal metal helices are bonded to the end coupling."



Although periodic testing of hoses is important, from a static grounding protection viewpoint, it would be safer to test the hoses prior to every transfer operation. In the 6 to 12 week period that the hoses are in use, breaks in end-to-end continuity can, and will, occur. Normally the metal helix that bonds the couplings of the hoses together will either break or loosen from its connection to the coupling.

If hoses with breaks in continuity are kept in service there is a strong chance that they will be accumulating static electricity during loading or vacuuming operations thus increasing the probability of static spark discharges when the hose is being used in a hazardous atmosphere.

The ideal procedure for proving a secure static grounding path for all the primary components used in the transfer, i.e. the tanker truck and the hose sections connected to the truck, would be to verify a ground for the truck via a truck mounted grounding system, or a rack mounted grounding system.

When the ground path for the truck is verified, the next operation would be to connect the hose(s) to the truck and then perform an electrical continuity test through the hose sections back to the truck. This would ensure that the hose will be capable of transferring static charges through its structure, onto the truck and down to ground via the static grounding system.

3.0 Testing hoses used in vacuum truck operations.

For vacuum truck operations the driver should perform an electrical continuity test between the end of the hose through which material will be sucked, back to the tank or chassis of the truck. This test ensures that there is electrical continuity through the hose sections and onto the truck itself. Any charge created on the metal components of the hose during the transfer operation will travel via the hose onto the truck and down to earth via the truck's Earth-Rite® MGV system.

Hose continuity tests are normally performed with a multimeter but given the circumstances in which the trucks are operating, which are typically harsh industrial environments and zoned/classified atmospheres, the meters, at minimum, need to be robust, rugged and certified for use in zoned or classified locations. More importantly, the technical competency and training required to operate the meters may present more problems than they would solve.

A Class I, Div. 1 hazardous location approved device like the OhmGuard® Hose Continuity Tester enables drivers to perform a simple and quick PASS or FAIL hose continuity test prior to each transfer operation. The driver simply looks for a pulsing green LED from the OhmGuard clamp to indicate complete continuity through the interconnected hoses and, in turn, the hose's connection to the truck. If the OhmGuard does not provide a PASS indication to the driver he can test each individual hose section to isolate the faulty hose and remove it from the transfer operation.

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WJTA-IMCA 2013 Conference and Expo

September 9-11, 2013 ● George R. Brown Convention Center ● Houston, Texas, USA

The WJTA-IMCA 2013 Conference and Expo is the largest Conference devoted exclusively to high and ultra high pressure waterjet and abrasive waterjet technology and related equipment and services.

The WJTA-IMCA 2013 Conference and Expo will include:

- **Educational Program**
  - **Boot Camp** for contractors and end users to learn new business ideas, safety recommendations, and tips and techniques to improve workforce productivity and stay competitive in today's marketplace.
  - **Waterjet Technology: Basics and Beyond Pre-Conference Workshop**
- **High-Tech Products and Equipment Displays** by leading industry manufacturers and suppliers from around the world.
- **Live Demonstrations** of precision waterjet cutting, equipment/system conversions, industrial vacuuming and offloading, rotary line cleaning, sewer line cleaning, tank/vessel cleaning, tube and bundle lancing, waterblasting, waterjet gun operations, and waterjet pumps.
- **Emerging Technology, New Applications -** The world's leading engineers and researchers will present papers that address new developments in applications, equipment, and procedures. The *WJTA-IMCA 2013 Conference and Expo Proceedings* will be available on CD-ROM.

Announcement and Call for Papers

The WJTA-IMCA invites you to submit an abstract for the WJTA-IMCA 2013 Conference and Expo. This program offers an excellent opportunity to highlight your work and research, network with the world's top waterjet professionals, and see and learn about new and innovative tools and equipment.

New techniques and applications are being developed and current ones are being improved. Waterjet technology, now being used in nearly all types of industry — manufacturing, mining, construction, concrete, stone, aerospace, engineering, oil and gas, power plants, process, and medical industries — continues to expand at a rapid pace.

Commercial and academic authors are encouraged to submit titles and abstracts for consideration. To submit an abstract(s), please complete the abstract submission form on page 22, attach a copy of your abstract(s), and mail to: Conference Coordinator, WJTA-IMCA, 906 Olive Street, Suite 1200, Saint Louis, MO 63101-1448, USA, or fax to: (314)241-1449. You can also go to www.wjta.org, fill out the abstract submission form online and email it along with a copy of the abstract to wjta-imca@wjta.org. **The deadline date for submission of abstracts is January 31, 2013.**

An Abstract Review Committee will review the abstracts. Authors will be advised beginning **February 28, 2013**, regarding the decision of the Abstract Review Committee.

The **WJTA-IMCA 2013 Conference and Expo** will focus, from a practical and scientific viewpoint, on the most up-to-date advances in waterjetting equipment, techniques, and applications. The areas to be addressed include, but are not limited to:

- **Abrasives, Water, and the Environment**
- **Advanced Industrial Applications**
- **Advances in High Pressure Technology and Equipment**
- **Automotive and Aerospace Applications**
- **Cleaning and Coating Removal**
- **Components and Systems**
- **Construction and Non-Manufacturing Applications**
- **Contractor Applications and Processes**
- **Demilitarization, including Removal of Land Mines (Demining)**
- **Drilling Applications**
- **Excavation, Tunneling, and Mining Applications**
- **Hydrodemolition**
- **Hydro-excavation and Vacuum Excavation**
- **Jet Mechanics and Visualization**
- **Jet-Material Interaction**
- **Manufacturing Processes**
- **Market and Future Needs**
- **Novel Jets and Applications**
- **Process Modeling and Control Studies**
- **Rock Cutting**
- **Safety, Training, and Environmental Protection**
- **Vacuum Equipment**

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Important Information for Authors

- Papers must be original. Papers must not have been published elsewhere or be pending publication.
- **Publication Fee.** A nonrefundable publication fee of $229 is required. One publication fee is good for 2 (two) papers. Paper(s) will **NOT** be included in the Proceedings if the publication fee is not paid. The presenting author can use this publication fee as their registration fee, equal to a Full Conference registration. Any additional authors can also register as a Full Conference registrant at the discounted price of $229. (A member Full Conference registration is equal to $299.) If an author wants to attend the Pre-Conference workshop (Combo registration), they will need to pay the difference at the applicable member price: $399 or nonmember price: $459.
- Papers and presentations must be in English. Papers should be no longer than 15 printed pages. A "Paper Guide" containing directions for submitting papers will be forwarded to you after your abstract is accepted. Papers that do not follow the "Guide" will be returned to the author(s) for correction(s) or charged a fee for revisions made by the WJTA-IMCA office.
- Papers should be free of commercialism.
- Papers should be submitted as a Word file and a PDF file.

Dates to Remember

January 31, 2013.....Abstracts Due
March 18, 2013.....Papers Accepted
June 17, 2013.....Papers Due
September 10-11, 2013.....Present Paper

WJTA-IMCA 2013 Conference and Expo
September 9*-11, 2013

Abstract Submission Form

For each paper to be submitted for consideration, please complete this form, **attach a copy of the abstract**, and mail, fax or email to WJTA-IMCA by **January 31, 2013**. Authors will be advised beginning **March 18, 2013**, regarding the decision of the Abstract Review Committee.

Paper Information

Paper Title _____

_____

Authors _____

_____

_____

Please check the category that best describes the general nature of your paper.

❑ Applications ❑ Research

Contact Person

(Please print or type)

Name _____
(First Name) (Surname/Family Name)

Position/Title _____

Company/Organization _____

Street Address _____

City _____ State/Province _____

Country _____ Postal Code _____

Telephone _____ Fax _____

Email _____

Signature _____ Date _____

Mail completed form and abstract, **NO LATER THAN JANUARY 31, 2013**, to: Conference Coordinator, WJTA-IMCA, 906 Olive Street, Suite 1200, Saint Louis, MO 63101-1448, USA, or go to www.wjta.org, fill out the abstract submission form online and email it along with a copy of the abstract to wjta-imca@wjta.org.

*September 9 is reserved for pre-conference workshop.

Key words

(Check the boxes that apply to your paper):

Type of Study

- ❑ Modeling
- ❑ Experimental study
- ❑ Hardware development
- ❑ Contractor case study
- ❑ Manufacturing case study
- ❑ Software development
- ❑ Economic analysis
- ❑ Legal and Safety
- ❑ Other _____

Process

- ❑ Cutting
- ❑ Drilling
- ❑ Surface preparation
- ❑ Cleaning
- ❑ Stripping
- ❑ Safety
- ❑ Milling
- ❑ Jet-assisted
- ❑ Other _____

Related Industry

- ❑ Generic
- ❑ Shipyard
- ❑ Mining
- ❑ Construction
- ❑ Aerospace/Aircraft
- ❑ Automotive
- ❑ Oil/Gas/Refinery
- ❑ Quarrying
- ❑ Other _____

Environment

- ❑ Field work
- ❑ Factory work
- ❑ Submerged
- ❑ Nuclear
- ❑ Demilitarization
- ❑ Offshore
- ❑ Other _____

Material

- ❑ Metal
- ❑ Rock
- ❑ Glass
- ❑ Ceramic
- ❑ Composite
- ❑ Concrete
- ❑ Other _____

Jets

- ❑ Waterjet
- ❑ Abrasive-waterjet
- ❑ Abrasive suspension jet
- ❑ Pulsed
- ❑ Cavitation
- ❑ Polymer Jets
- ❑ Other _____

Static Electricity on Hoses - Causes, Hazards and Prevention, from page 19

4.0 Testing hoses used in the loading or unloading of bulk chemical tank trucks.

When tankers are bottom loading or offloading product through sealed hose connections at bulk storage chemical terminals or chemical manufacturing sites they should be grounded with a rack mounted or truck mounted grounding system. In addition the hoses through which the product is transferred should be conductive.

One of the risks of using a hose with an isolated component in a closed connection transfer, e.g. the metal helix breaks contact with the hose coupling, would be at the end of a transfer operation when a vapor is present and as the driver removes the hose from the truck; the connector could receive a static spark discharge from the wire helix or the wire helix could discharge a spark onto the site's loading connection.

Using an OhmGuard the driver can test the conductivity of his hose prior to the transfer operation. This ensures that all the hose sections, including the couplings on both ends of the hose have proper continuity. If the situation permits, the driver may also connect the hose to the site's filling connection point and then perform a continuity test between the tanker and the site connection. This test will not only verify continuity through the hose, the tester could also be left in position for the duration of the transfer so that the driver has a good indication of hose continuity in combination with a verified ground indication from the loading rack or truck mounted grounding system.

If the driver is transferring the contents of the tanker into an Intermediate Bulk Container (IBC) at a customer site, he should check the electrical continuity of the hose prior to transferring the product into the IBC. The tanker should be grounded and the IBC bonded to the truck, or grounded itself.

5.0 Unloading tank trucks at gas service stations.

For situations where tanker trucks are gravity offloading or pumping gasoline into underground storage tanks at gasoline service stations, the tanker truck is assumed to be grounded

(continued on page 27)

Call for Nominations – 2013 WJTA-IMCA Board of Directors, from page 14

Pat DeBusk's unexpired term of office and will serve the remaining two years of the four-year term ending in September 2015.

The WJTA-IMCA bylaws provide that no more than one of the elected board members may be from the same company or organization. Therefore, board members may not be nominated from the same company or organization already represented on the board by individuals whose terms expire in 2015, including **CSM Supply** (Luis Garcia), **The Dow Chemical Company** (Kathy Krupp), **High Pressure Equipment Company** (Larry Loper), **StoneAge, Inc.** (Kerry Petranek Siggins), and **NLB Corporation** (Forrest Shook).

According to the WJTA-IMCA bylaws, any WJTA-IMCA member in good standing (2012 membership dues paid) may submit a nomination(s). A nominee who has not paid her/his dues by **March 31, 2013,** shall be declared ineligible to run for office in the 2013 election. The deadline for making nominations is **March 31, 2013. Your nomination(s) should reach the WJTA-IMCA office no later than March 31, 2013.**

To submit a nomination(s), complete the Nomination Form on page 14 and return, along with a biographical sketch and a statement of your nominee's mission and vision for WJTA-IMCA, to: WJTA-IMCA
906 Olive Street, Suite 1200,
Saint Louis, MO 63101-1448.

Remember, nominations must be submitted to the WJTA-IMCA office **NO LATER THAN MARCH 31, 2013. Nominations must be accompanied by a bio and mission and vision statement.**

WJTA-IMCA Celebrating 30 years

WSI Waterjet Systems International™ Announces Name Change from Waterjet Service Inc.

WSI Waterjet Systems International™ (formerly named Waterjet Service Inc.), manufacturer and servicer of ultra-high-pressure and high-performance waterjet cutting pumps and replacement parts, announces a name change to better reflect the international nature of its worldwide waterjet cutting products, service, support and customer base.

"WSI Waterjet Systems International has always had a reputation for quality, dependability and a uniquely committed approach to providing customers with the reliable long-term support critical to the successful operation and maintenance of high-pressure waterjet cutting pumps," says Dan Goodhope, general manager, WSI Waterjet Systems International. "All of our proprietary technology, cutting pumps, accessories and replacement parts are designed and manufactured at WSI's headquarters in America, but our customers and ability to service them are truly global."

Built on more than 20 years of experience and cutting-edge research and development, WSI is operated by some of the waterjet industry's most experienced and respected veterans, leading the company's winning approach to cost-effective, easy-to-operate-and-maintain, superior-quality waterjet cutting products and service.

WSI introduced its newest waterjet cutting pump - the all-new V40, in October at EuroBLECH. Poised to make waterjet pump ownership a first-time reality for many businesses, the V40 utilizes WSI's industrially proven intensifier technology for a fraction of the price and footprint, and is designed to serve the waterjet cutting needs of the masses by maximizing efficiency and output at a substantially lower purchase price.

WSI Waterjet Systems International handcrafts its high-pressure cutting pumps, components and replacement parts. Everything from frame welding to patented technology is created onsite at WSI by its skilled team of engineers and machinists.

WSI pays attention to detail and follows rigorous quality control standards. No part, component or pump is branded with the WSI name before passing a meticulous battery of inspections that guarantees both aesthetic and working perfection.

WSI's cutting pumps and parts offer reduced operating costs, a longer running life and ease of operation and maintenance. This includes its line of preferred replacement parts for use on KMT-style equipment.

For more information, call (417)781-7778 or visit www.WaterjetSystemsInternational.com

Expanded NLB Website Has Even More for Waterjetters

A significant expansion of the NLB Corp. website, www.nlbcorp.com, makes it even easier for people to find waterjetting answers, identify pumps and accessories for their applications, and request a quote. The expanded site is easily searchable for specific equipment or by application, with handy links to the equipment typically involved.

"This website will save customers a lot of time," says Jim Van Dam, NLB marketing communications manager. "It lets people quickly find the information they need — about NLB equipment or waterjetting in general — to maximize their productivity."

The expanded website has more information about common (and not-so-common) applications, with a variety of video demos. Comprehensive sections for pumps, units and accessories feature simple "Learn More" and "Request a Quote" buttons that take visitors where they need to go with a single click. Interactive maps identify locations in North America and around the world where NLB equipment and support are available.

Other user-friendly offerings include job postings (by job type and location) and downloadable credit applications and parts return forms. A new section features NLB news and events, and an expanded Resources offers for download the full NLB library of catalogs, spec sheets and product application bulletins, as well as waterjet FAQs, reference tables and typical hook-ups.

Visit www.nlbcorp.com for more information.

Hughes Gets a Green Light on Taiwan Metro System

A Hughes Pumps rail cleaning pumpset unit is being used on the Taiwan's capital of Taipei's Metro system for jetting away dirt and grease from underground rail tunnels and railheads to reduce fire risk and increase traction.

This latest contract, secured through local agent Pumpson Systems Inc., follows on from a Rail Cleaning Unit supplied to the same Taiwanese company in 2006.

The Hughes pumpset in this latest contract uses a 400 kW (540 hp) Caterpillar engine fitted with a catalytic converter, making it suitable for underground use, driving a 200 bar HPS3000 pump and a 900 bar HPS2200 pump via a transmission developed by Hughes to provide two output shafts from a single input.

The system includes nine separate cleaning channels to enable various areas of the tunnel to be cleaned individually or all together and is

controlled by a Programmable Logic Controller (PLC) mounted in the train driver's cab.

As well as designing specialist, bespoke systems, Hughes Pumps has considerable experience in the rail industry through the supply of systems that remove leaves from railway lines – a perennial problem on the UK's railways.

Taipei (pop. 2.7 million) is the political, economic, and cultural centre of Taiwan. Since its inception, the metro system, which now comprises a network of 4 conventional mainly underground metro lines and 1 automated elevated light rail metro line of 97 stations and 112.8 km (70.1 miles) of track, has proven effective in relieving some of Taipei's traffic congestion and has acted as a catalyst for urban renewal, as well as increasing tourist traffic.

For more information, email sales@hughes-pumps.co.uk or visit www.hughes-pumps.co.uk.

via the transfer hose connection to the service station coupling that feeds into the underground storage tanks. Despite the increased use of fiberglass tanks and piping the receiving tanks are assumed to be providing the connection to a true earth ground. Although tanker trucks are protected from static electricity with dedicated static ground monitoring systems at the refinery tank truck loading terminal, no grounding checks are performed at the service station unloading point even though the immediate area where the hose is connected to the service station filling point is typically designated as a Class I, Div. 1 location [2]. It should be noted that neither the NFPA nor API stipulates any requirements in relation to the use of conductive hoses specifically in relation to underground tank loading operations at gas service stations. Under API and NFPA guidance both conductive and non-conductive hoses may be used for underground tanks at gas service stations.

To eliminate the risk of charge accumulation on conductive hoses, after the driver completes the connection of the hose from the tanker to the filling point of the site, he can test the continuity between the tanker and the service station filling point with an OhmGuard which will verify that the hose is conductive and is securely bonding the tanker to the filling point of the service station. The OhmGuard can remain connected during the transfer with the green LED pulsing continuously to indicate a good bond between the truck and the service station filling point. Provided the filling point at the service station has a verified true earth ground connection, static electricity will not accumulate on the hose or the tanker. Quoting from section **5.6.2 of CLC/TR: 50404 (ref. Table 1)**, which addresses road tanker truck deliveries:

> *"Deliveries from road tankers to medium sized tanks are performed via flexible hoses using either gravity feed or pumps on the vehicle. Electrostatic ignition hazards may occur as a result of sparks from insulated conductors (e.g. hose couplings or the road tanker as a whole), brush discharges from nonconductive hoses or brush discharges within the receiving tank.*
>
> *The following precautions are recommended:*
>
> - *conductive or semi-conductive hoses (see 5.5.5 of CLC/TR:50404) should be used.*
> - *ensure that the truck and all metallic couplings are bonded to the tank being filled. Separate bonding is not needed when the hoses are conductive or semi-conductive as bonding is provided by the hose.*

Figure 5: Truck loading underground tanks at a gasoline service station.

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StarJet™ System Preps Runway Used for Space Shuttle Landing

When the space shuttle Endeavour made its final landing Sept. 21 at Los Angeles International Airport (LAX), it arrived on a runway maintained by a StarJet™ pavement marking removal system from NLB Corp.

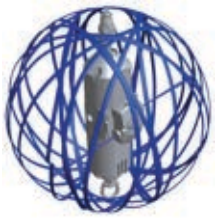
The StarJet, operated by Sterndahl Enterprises, Inc. of Sun Valley, California, removes old runway markings and rubber build-up with high-pressure waterjets (up to 40,000 psi) without the pavement damage that often results from abrasives or grinding. The self-contained system has rotating waterjet nozzles on a front-mounted articulating arm with a pump unit, water tank, and vacuum system to recover the water and debris.

NLB Corp., a global leader in high-pressure and ultra-high pressure waterjet systems, manufactures a full line of quality waterjetting pump units and accessories for contractor and industrial uses, including pavement stripe removal, runway rubber removal, pipe and tube cleaning, surface preparation, product removal, tank and tube bundle cleaning, concrete hydrodemolition, concrete and pipe cutting, and more.

For more information, call (248)624-5555 or visit www.nlbcorp.com.

Powerful 3-D Head Fits Through 6" Tank Opening

The new Torrent™ 50 tank cleaning head from NLB Corp. delivers 3-D waterjet action with the force of 600 hp water, and fits through a tank or reactor opening as small as 6 inches (15 cm).



The Torrent 50, rated for pressures up to 20,000 psi (1,400 bar) and flows to 50 gpm (183 lm), has two high-velocity waterjets that spin vertically while the head spins horizontally. The result is complete 3-D coverage of the tank or reactor interior that removes hardened resins, plastics and more. The process is fast, productive and environmentally-friendly, and eliminates any need for personnel to enter the vessel.

The Torrent 50 has a stainless steel body that is rugged, corrosion-resistant and easy to clean. It also features an improved seal design that is easier to change than the seals in older 3-D heads while providing longer life, and a magnetic brake system to control the rotation speed.

For more information, call (248)624-5555 or visit www.nlbcorp.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.

Static Electricity on Hoses - Causes, Hazards and Prevention, from page 27

- *when connecting the truck to the receiving tank, first connect the hose to the truck and then, before removing the tank fill pipe cap or making any other hose connections, equalize the potentials by touching the end coupling of the hose on the fill pipe cap or any other metallic part of the tank.*
- *providing the maximum safe filling velocities for medium sized tanks are not exceeded (see 5.4.4 of CLC/TR:50404) there is unlikely to be an ignition hazard within the tank. If the liquid contains a second phase, the filling velocity should be restricted to 1 m/s.*
- *the continuity of conductive hoses should be checked regularly."*

Summary

Hoses play an important role in hazardous area operations and owing to their direct interaction with moving liquids and powders are especially at risk of becoming electrostatically charged. It is important to ensure that hoses used within a hazardous area are capable of transferring electrostatic charges from their structure onto grounded equipment. At no point in its structure should such a hose be permitted to accumulate static electricity. Even so, no hose is immune to operational wear and tear and regular electrical continuity testing will enable detection of damaged hoses. Although periodic testing will identify faulty hoses, a simple test by an OhmGuard hose continuity tester, prior to each transfer operation, will ensure a faulty hose is identified and removed as soon as it becomes an ignition risk.

References:

1. Thomas H. Pratt, 2000, "Electrostatic Ignitions of Fires and Explosions," pg. 115-pg.117, AIChE/CCPS.

2. NFPA 30A, "Code for Motor Fuel Dispensing Facilities and Repair Garages," Table 8.3.2, National Fire Protection Association, 2012.

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WJTA-IMCA Welcomes New Members

Corporate

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Fax: (281)534-9305
Website: www.bwfluid.com

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Alix, Alberta T0C 0B0
Canada
Phone: (403)788-3883
Fax: (403)788-3723
Website: www.kri-tech.net

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Kyle Kellogg
Mike Vaccaro
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Phone: (732)961-7610
Fax: (732)791-2182
Website: www.newson-gale.com

Thompson Industrial Services, LLC
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Donnie Herlong
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Sumter, SC 29150-4948
Phone: (803)773-8005
Fax: (803)934-8935
Website: www.thompsonind.com

Ultimate Washer
Kevin Netzer
711 Commerce Way, Unit 1
Jupiter, FL 33458
Phone: (561)741-7022
Fax: (561)741-2125
Website: www.ultimatewasher.com

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Phone: (905)859-0847

Bob Haller
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Email: bobhaller@pmsone.com

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The Mundy Companies
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Bay City, Texas 77414
Phone: (979)241-4088
Email: ray.hundley_contractor@oxea-chemicals.com

Matt Kruse
Plant Maintenance Services
2 Ultraway Drive
Highland, Illinois 62249
Phone: (580)716-9996

Carlo Parrotta
Suncor Energy Inc.
150-6th Avenue SW
Calgary, Alberta T2P 3Y7
Phone: (403)296-5229

Wishing you a healthy, happy and prosperous New Year!

WJTA-IMCA Officers, Board of Directors & Staff

Index of Advertisers

OMAX® Corporation Names New Distribution Partner for Middle East

German-Gulf Enterprises selected for its high levels of customer service and support

OMAX Corporation, a leading total solutions provider of advanced abrasive waterjet technology, recently named German-Gulf Enterprises Ltd. its new distribution partner for the Middle East. German-Gulf will sell and support premium OMAX JetMachining® Centers and versatile MAXIEM® JetCutting Centers in the United Arab Emirates, Saudi Arabia, Qatar and Oman.

Established in 1974 with its main office, service workshop and showroom located in Sharjah, United Arab Emirates, German-Gulf Enterprises offers a wide range of products and services, including a welding and cutting division that has specialized in waterjet technology for more than a decade.

Known for its high levels of service and support throughout the regions it serves, German-Gulf Enterprises employs more than 400 employees and its service workshop is well equipped with German standard tools and ultra modern test benches. The company also relies on its highly experienced and well-trained service team to increase the service life of repaired machine components, which minimizes downtime and gives customers a competitive edge.

According to Steve Ulmer, vice president of international sales for OMAX, among the main reasons OMAX Corporation selected German-Gulf Enterprises as a distribution partner was for its highly respected reputation in providing excellent customer support and engineering services.

"Because German-Gulf takes an engineering-based approach to system integration, I am confident they will be able to successfully engage OMAX and MAXIEM customers throughout the Middle East on emerging technology and solution ideas for boosting productivity and profitability," Ulmer notes.

OMAX has international distributors in 50 countries, and this new partnership demonstrates the company's commitment to expanding its global reach and increasing the availability of its highspeed, precision-engineered technology in the Middle East. By offering the broadest range of table sizes, pumps, accessories, software and support on the market, OMAX Corporation offers everything manufacturers and job shops need to gain a competitive advantage in today's challenging global marketplace.

For more information, visit www.omax.com and www.german-gulf.com.

2013 WJTA-IMCA Conference & Expo

Reserve Your Exhibit Space for 2013

For more information, contact Peter Wright at the WJTA-IMCA office by telephone: 314-241-1445, fax: 314-241-1449, or email: wjta-imca@wjta.org.

We can handle YOUR Pressure!

Count on our proven valves, fittings & tubing for ALL your waterjet cutting & blasting needs

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For more than 55 years we've handled the pressure of consistently meeting our customer's goals for quality, delivery and economy. We stock an extensive inventory allowing us to offer same day shipping of many products. And our technical/engineering team will help you with special requirements, from exotic alloys to custom manifolds, usually available with short lead times.

If you're looking for a company to handle all of your waterjet cutting and blasting needs, remember there's only ONE High Pressure... HiP!

High Pressure Equipment Company

HiP

ISO 9001 CERTIFIED

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