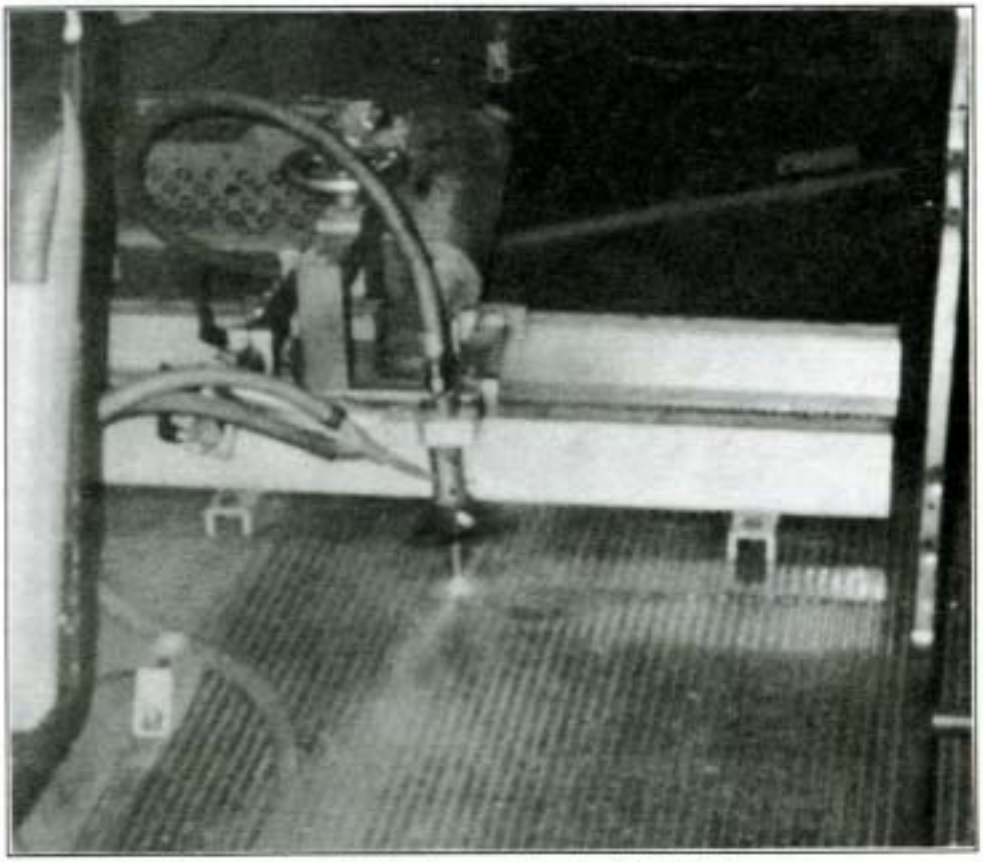
WJTA Jet News
Water Jet Technology Association
FEBRUARY/MARCH 1994
Published by the Water Jet Technology Association for the benefit of its members
818 Olive Street, Suite 918 • St. Louis, MO 63101-1598, USA • Telephone: (314)241-1445, Fax: (314)241-1449

Water Jets Help The Handicapped

Water Jetters can make a significant contribution to society. William White, President of Waterjet Corporation of Calgary, Alberta, Canada, did so after he learned an organization that retrains brain-injured and physically-limited people had a donated bus that they needed cut in half.

The organization, Easy Street, gives people a safe, yet authentic environment to relearn skills lost because of accidents. In a number of locations Easy Street has mock-ups of a city street, complete with cafes, banks, and shopping areas. Now in Calgary they have a bus that has been cut in half as well.



An abrasive jet cuts through the layers of material in the bus.

This bus, the only one of its kind in the 50 Easy Streets in North America, allows for a great deal of specific programming for clients with brain injuries. Areas that are addressed include making the proper change for a bus ticket, mapping out a bus route, role playing as a passenger, practicing getting on and off the bus, and social interaction skills.

The bus was donated to Easy Street as a training aid. However, the bus could not be used at first because, as William White explains, "there were space problems." The facility was too small to accommodate this full size bus. The bus had to be cut in half so that it could fit into the facility.

Conventional methods of cutting through the bus presented major problems because of the wide variety of materials in layers in the bus. For example, a method that gave a clean cut through steel might result in burning or tearing problems as it went through aluminum, wood, plastic, or carpet.

William White solved this problem. He used abrasive jet cutting – the same technology that was used to cut and cap sabotaged oil wells in Kuwait following the Gulf War. (See the February 1992 issue of ***Jet News***). He used a 36,000 psi water jet with garnet abrasives.

(continued on page 4)

Flow Offers To Buy Ingersoll-Rand

Flow International Corporation has signed a letter of intent to acquire the assets of the Waterjet Cutting Systems Division of Ingersoll-Rand Company. Completion of the transaction is contingent upon finalization of a definitive acquisition agreement, government clearance, and other items.

"We look forward to strengthening the position of our materials separation division, offer our customers a broader array of products and service, and to be even more competitive with other materials separation technologies," confirms Ronald W. Tarrant, Flow's president and chief executive officer. "This transaction is a very significant one for our company, as it accomplishes another important step in the completion of our long range strategic plan. We hope to be able to complete this transaction in the first quarter of the calendar year 1994," he says.

WJTA Administration

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Jet Edge Acquired By TC/American

Jet Edge, a leading manufacturer of ultra-high pressure waterjet cutting and cleaning equipment, became a division of TC/American Monorail, Inc., as of February 1, 1994. The ownership change unites Jet Edge with a company whose focus is designing and manufacturing superior industrial equipment.

TC/American has been designing and manufacturing industrial materials handling equipment for over 60 years. Headquartered in Hamel, MN, the privately-held TC/American has increased sales from $3 million in 1982 to $25 million in 1993.

Jim Brandt, President of TC/American says, "Jet Edge has a superb reputation within the markets it serves as the manufacturer of innovative waterjet equipment and the provider of superior service to its customer base. TC/American intends to build on these strengths and is committed to expanding Jet Edge's position in the ultra-high pressure waterjet market."

Report On WJTA Board Meeting

The WJTA Board of Directors met on Saturday, January 8, 1994, at the Westin Hotel in Rosemont, Illinois. The board took the following action:

1. A policy was adopted regarding the printing of the ***Membership Directory***. The ***Directory*** will be printed in January and will include those members as of the previous November.
2. A draft of a new edition of the publication, ***Recommended Practices For The Use Of Manually Operated High Pressure Water Jetting Equipment***, was reviewed. A number of revisions were suggested. Additional revisions were to be sent to Dr. Summers for inclusion in the final version which should be available later in the year.
3. Decided to accept 60 papers for presentation at the Eighth Water Jetting Conference.
4. Decided to hold the Ninth Water Jet Conference in Detroit in 1997 if an acceptable proposal is received from a hotel.
5. Decided that all recipients of the Pioneer Award will be offered complimentary registration to future biennial Water Jet Conferences.
6. Set the fee for Student membership in the Association at $20.
7. Established an outreach committee to investigate the feasibility of the Association offering another short course to be given at irregular intervals during the year, or producing a videotape describing water jet technology.
8. Appointed Forrest Shook, David Summers, Thomas Kim and Mohan Vijay to the Board of Directors of the International Society of Water Jet Technology.
9. Scheduled the next Board Meeting for June 11, 1994, in Detroit.

Water Jet/Laser Manufacturing Applications Seminars May 16-20, 1994, At Milwaukee School Of Engineering

These courses cover the basic technology and use of fluid jets and lasers in manufacturing applications. Both of these methods are becoming more important in advanced manufacturing applications because of their flexibility and adaptability to a wide range of materials and machining applications (i.e., cutting, drilling, milling, turning, polishing, welding, marking, and surface treatment/ modification such as hardening and improved fatigue resistance). Both of these technologies are beam based, and often compete for specific applications. They are easily integrated with robots and other automation equipment to provide flexible manufacturing cells for small batch processing.

Course content includes technology basics, process characteristics and controlling parameters, equipment types, features, and options, capital and operating costs, and applications. The laser course will run from May 16-17, 1994, and the fluid jet course will follow on May 18-20, 1994. The courses will be held at the Milwaukee School of Engineering, Milwaukee, Wisconsin. A special laboratory session in the fluid jet technology course will provide the opportunity for participants to evaluate fluid jet applications through a hands-on processing experience. Attendees are encouraged to bring samples to the seminar, or send the samples before the seminar to allow adequate set-up and preparation time to evaluate the application.

For further information on course content contact:

Thomas J. Labus
(414)277-7284

For course registration materials contact:

Sue Hoerchner
Milwaukee School of Engineering
(414)277-7217

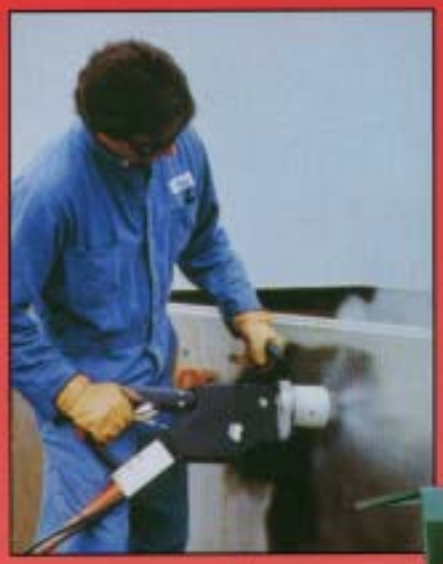
Water Jets Help The Handicapped, from page 1

White's crew placed a protective tarpaulin around the bus in the bus garage. They achieved a quick, clean cut (see figure below) completely through the bus while full size busses came and went as normal in the garage.

White's efforts were donated because he considered Easy Street to be a good cause. The handicapped persons trained to live more mobile and independent lives with the aid of this bus would, no doubt, agree.

Bus cut in half with an abrasive jet.

Built to Blast



Reliable valves, fittings and tubing built for water blasting applications

- High flow 1" series for pressures to 30,000 psi
- Worldwide technical and product support
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We specialize in UHPW Components. We make nozzles - fittings - parts on hand. Some cases next day delivery. We can work from sketches, prints or sample parts. No job too small or too large. When you need fast, accurate, dependable service you can count on, call or fax – **PHILLIPS**, "the service company."

We understand downtime as well as on time – every time!

You've tried the rest, now call the BEST and ask for Joe Phillips.

Thank you.

Watch for our new catalog coming soon.

Think about this!

Every morning in Africa a gazelle wakes up. It knows that it must run faster than the fastest lion or it will be killed. Every morning a lion wakes up. It knows that it must outrun the slowest gazelle or it will starve to death.

It doesn't matter whether you are a lion or a gazelle, if it's in Africa or the USA. When the sun comes up you had better be running.

Committee Appointments

The following is a list of WJTA committees and appointees. Also listed below is a description of each committee. Descriptions that are not found below will appear in the next issue of the *Jet News*.

1997 WJTA Conference Site Selection Committee:
Thomas J. Labus, Chairman
Forrest Shook
Thomas J. Kim, Ph.D.

Nominations/Elections Committee:
Mohan Vijay, Ph.D., Chairman

Membership Committee:
Andrew F. Conn, Ph.D., Chairman
Bill Hall

Awards Committee:
Forrest Shook, Chairman
Mohan Vijay, Ph.D.
John Wolgamott
Mohamed Hashish, Ph.D.

Contractors Committee:
Bruce Wood, Chairman
Andrew F. Conn, Ph.D.
John Wolgamott

Manufacturers Committee:
Mohamed Hashish, Chairman
Thomas J. Labus
Thomas J. Kim, Ph.D.

Technology/Research Committee:
Thomas J. Kim, Chairman
Mohamed Hashish, Ph.D.
Thomas J. Labus

1995 WJTA Conference Committee:
George Rankin, Chairman
Thomas J. Kim, Ph.D.

Safety Committee:
George Savanick, Ph.D., Chairman
Arthur Miller

Bylaws Committee:
David Summers, Ph.D., Chairman
John Wolgamott

Nominations/Elections Committee:
The objective of the Nominations/ Elections Committee is to seek suitable candidates for election to the Board of WJTA. As stated in the revised bylaws,

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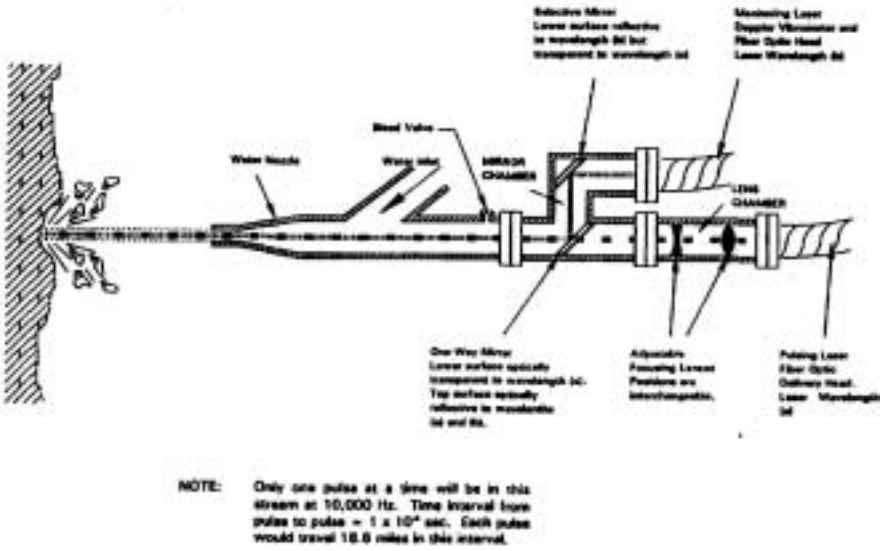
Laser Inside A Water Jet



The Laser-Water Jet
(Patent Pending)

As part of a contract with the Electric Power Research Institute, under which INTERPRO is investigating the use of pulsing lasers for hard rock mining and concrete excavation, recent testwork sponsored by the Center for Materials Production has revealed the technical and economic merits of pulsing the laser inside a high pressure water jet.

This water jet not only provides a consistently clear path between the laser and the rock or concrete surface, but also contributes to five excavation mechanisms that are simultaneously activated:

1. Micron-thick layers of rock are vaporized with each pulse forming a gas plasma. This plasma is momentarily held against the rock surface by the water jet, creating pressures approaching 1,000,000 psi, which impart instantaneous shock waves to the rock in much the same way as traditional explosives.
2. The rate of these miniature explosions is controlled up to thousands of times per second, and is continuously adjusted to match the resonant frequency in the target area. This shock wave reinforcement increases the amplitude of vibration until the local tensile strength of the rock is exceeded.
3. The shock wave imparted to the rock is also generated in the water. This hydraulic transfer can excavate an area four to eight times the area directly affected by the laser pulse.
4. The cyclic loading of the rock surface reduces local tensile strengths of the rock by up to 70%.
5. The water jet itself is capable of excavating rock, particularly if the rock is damaged with microcracks as would be expected from the other mechanisms.

The concept of this continuous, hard rock mining tool, which receives laser pulses via fibre optics, might be applied in rock excavation. The tool could be easily automated or controlled remotely, and has the potential to have a major beneficial impact on the economics of

(continued on page 9)

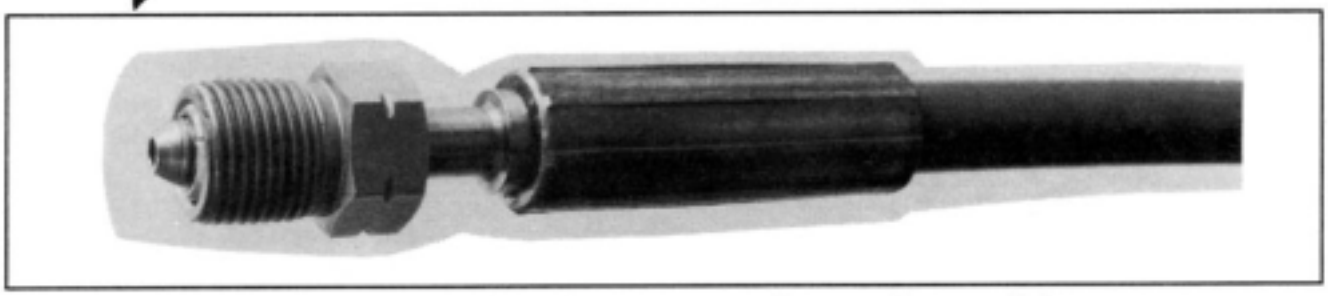
Rogan and Shanley, Inc.
-a polyflex company-

NEW!

Jet Cutting Hose

The new Polyflex 8005St Jet Cutting hose is now in stock and available for immediate delivery!

The new hose features extremely high burst pressure, outstanding fatigue resistance and excellent flexibility, and is highly recommended for extreme pressure applications such as ultra-high water jetting and jet cutting.



The New 8005St Jet Cutting Hose

Specifications

Burst Pressure:	**120,000 psi**
Max. Working Pressure:	**60,000 psi (with shield)**
Standard Working Pressure:	**48,000 psi**
Bore Diameter:	**0.17"**
Outside Diameter:	**0.57"**
Min. Bend Radius:	**12"**
Weight (lb/ft):	**0.35**
End Fittings:	**3/8" and 9/16" HP Tubing Nipples**

Come and see this and other exciting new Polyflex products at the 7th American Water Jet Conference, August 28-31in Seattle - Booths124 and 125.

Rogan and Shanley, Inc.
-a polyflex company-

4263 Dacoma, Houston, TX 77092
tel **(800) 446-5236** Fax (713) 686-1292

Jet Edge Offers Three New Pumps

Jet Edge is adding Model 57-75 and 55-150 ultra-high pressure waterjet intensifier pumps to its product line. The 57-75 HP pump generates up to 1.6 gpm at pressures up to 57,000 psi, and the 150 HP pump generates up to 2.9 gpm at pressures up to 55,000 psi. The pumps incorporate an efficient layout allowing easy access to all service and maintenance points, which reduces service time. The pumps are among the quietest available due to the addition of a superior sound abatement package. Advanced component designs introduced with these pumps improve the component life and simplify maintenance.

Jet Edge is also introducing its new Model 36-250D ultra-high pressure waterjet intensifier pump. The new 250 HP diesel pump generates up to 7.2 gpm at pressures up to 36,000 psi; 18% more gpm than the previous model. The ultra-high pressure cleaning equipment is used in industrial markets for paint stripping automotive plants, tough coating removal at chemical and oil refineries and general plant cleaning applications. The pump is also used in the construction market for hydro-demolition and abrasivejet cutting of steel and concrete.

For more information, contact **1-800-JET-EDGE.**

Water Jetting Publications Available

Proceedings of the 7th American Water Jet Conference, a two volume set, soft cover, over 900 pages long. Includes a compilation of 71 papers, including photos and illustrations, presented at the Conference.

Fluid Jet Technology - Fundamentals and Applications, Second Edition, newly revised and updated. Ten chapters cover the basics of water jetting technology.

For more information contact:

WJTA
818 Olive Street – Suite 918
St. Louis, MO 63101-1598
Phone: (314)241-1445
Fax: (314)241-1449

Flow Introduces Ultrahigh-Pressure Waterjet Pump

Flow International Corporation introduced the 7X ultrahigh-pressure waterjet pump. A 7X-based waterjet system offers industrial firms an affordable, environmentally sound solution to their cutting needs.

Flow International Corporation's New 7X Ultra-High Pressure Waterjet Pump

FLOW designed the 7X for use with waterjet and abrasive waterjet applications in the automotive, aerospace, paper, food processing and architectural industries. Operating at pressures up to 55,000 psi, a 7X-based system will cut metals, composites, plastics, stone, marble, glass, paper, food, foam, rubber and carpet.

FLOW incorporated several advanced features into the 7X. Available in single and redundant intensifier configurations, customers can select from 30,000, 40,000 or 55,000 psi models. Equipped with a 30-horsepower electric motor, the 7X capably drives multiple waterjet nozzles for high-volume applications.

The 7X requires everything needed to power an ultrahigh-pressure waterjet system. The pump features a frame mounted, single-bank inlet water filter package and PLC controls to monitor pump operations and shut-down sensors.

FLOW constructed the 7X with a durable plastic cabinet and steel frame. The hinged top cover and lightweight side panels remove easily for routine maintenance operations. The pump's compact design minimizes floor space requirements, a critical concern for industrial firms with small manufacturing facilities.

By following advanced concurrent engineering techniques, FLOW substantially reduced the cost of 7X product development while improving the pumps configuration and functionality. The company passed on the cost savings achieved through concurrent engineering to the customer.

A 7X-based ultrahigh-pressure waterjet system uses filtered tap water to cut materials, adding no hazardous substances to the machining process. The supersonic process creates a localized vacuum that pulls the water and kerf material downward directly into catcher tanks, minimizing airborne dust common with saws and routers. The minimal amount of kerf width associated with waterjet cutting also reduces the amount of material waste.

For more information contact: **Richard Sepe, Flow International Corporation, (800)446-3569 or (206)813-3364.**

NLB Offers Cold To Hot Water Conversion

A new hot water system from **National Liquid Blasting (NLB)** lets users convert their cold-water water-blast equipment to hot water, instead of buying another unit. Model HW35-1M is self-contained and trailer-mounted with one million BTU burner that can be used with virtually any waterblaster.

Hot water removes petroleum-based products from floors, conveyors, and industrial processing equipment. The hot water strips the oily film left by cold waterblasting, according to NLB, eliminating the need for chemicals, detergents, or degreasers.

It provides flows up to 16 gmp at 180°F with 80 gallon fuel tank. The system is mounted on a dual-axle trailer.

NLB Waterblasting Cabinet Cleans Without Solvents

A high pressure waterblasting cabinet from **NLB** cleans components and strips away the old paint with high-pressure water, heated to 180°F.

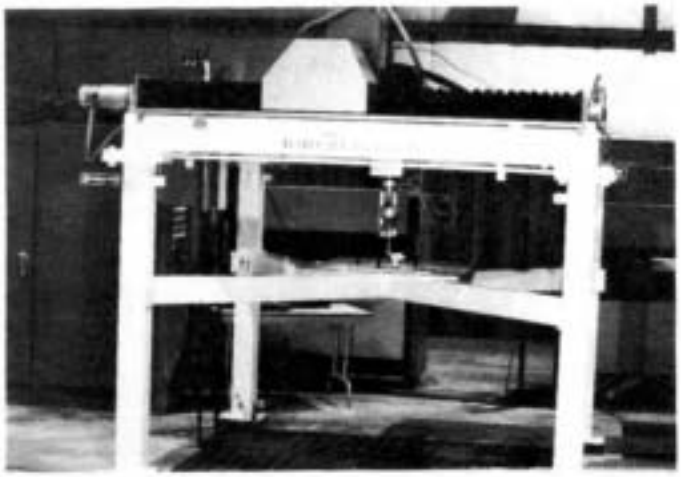
It features a rotating parts basket for batch cleaning. Cabinet and basket accommodate parts of different sizes and parts. Two rotating seals are mounted inside to assure thorough coverage. Loading and unloading is easy.

It also features an 8125E high-pressure pump, 32 gpm at 8,000 psi. An oil separator and bag filter simplify disposal. Water is heated by two natural gas-fired burners.

For more information on these two products contact: **NLB, 29830 Beck Road, Wixom, MI 48393-2824, telephone: (313)624-5555, fax: (313)624-0908.**

FOR SALE

5 AXIS WATER- JETTING ROBOT



ROBOT

Manufactured by Robotics, Inc., 1985. 300 hours total time since new. Excellent machine in mint condition.

X axis - 60" travel - ballscrew/direct servodrive
Y axis - 48" travel - ballscrew/direct servodrive
Z axis - 12" travel - ballscrew/direct servodrive
W axis - +/- 45 degree (tilt axis)
R axis - 360 degree rotary
Axial feed rates: 0 - 1500 inches per minute

Adjustable height X frame for table support and vibration dampening.
C.N.C. Control: Allen Brady 8200R, full bubble memory, circular interpolation, integrated diagnostics, moveable control station plus digital accessory teach pendant w/50' cord.

Floor space requirements : 136" X 132"

POWER SUPPLY

Manufactured by Flow International, 1985.
60,000 p.s.i, 75 H.P. dual intensifier, Model 106A with water filtration system and booster pump.
Total time since new : 300 hrs.

SYSTEM PRICE : $125.000 Can be viewed under power, in operation.

Approximate system replacement cost new : $300,000

WATER-JETechnologies, Inc.
656 Nims Avenue - Muskegon, Michigan 49442
(616) 744-0121

Laser Inside A Water Jet, from page 6

mining, metal recovery and concrete removal. It is silent, produces negligible ground vibration, and does not release dust, fumes or chemicals into the environment. It can, therefore, also be used near populated areas, day or night, for all forms of hard material removal.

A continuous stream of rock or concrete chips, generally less than 1/4 inch, will be removed by the tool and immediately captured by a vacuum system delivering to a pump. Removed material can be separated from water away from the working area and the water returned in a closed cycle system.

Questions or requests for additional information should be addressed to: **Mr. John G. Sellar, INTERPRO, 5906 McIntyre Street, Golden, CO 80403, telephone: (303)279-2581.**

Committee Appointments, from page 6

six directors will be elected just prior to each Biennial General Meeting of WJTA (the next one to be held in August 1995 at Houston, Texas, USA) to serve the Association for **four** years. An announcement seeking names of nominees will be published in the WJTA newsletter six months prior to the General Meeting. Any member in good standing may nominate a member candidate for election to the Board. **Voting will be by mail ballot.**

The names of those running for election with relevant information on their background will be published in the WJTA newsletter four months prior to the General Meeting. Names of the six elected directors will be announced at the Biennial General Meeting. Inquiries should be directed to Mohan M. Vijay, Ph.D., Chairman, Nominations/Elections Committee, through the Association's Office.

Membership Committee: 1) Public Relations: coordinate with other technical committees (contractors, manufacturers, technology/research), seeking ways to expand the awareness of possible new members to the benefits they could gain from belonging to the WJTA. 2) Membership Development: develop programs to actively recruit new (and re-enlist prior) members, both corporate and individual. 3) Membership Relations: continue to seek feedback from members, using surveys and other means, as to how the WJTA can better serve their needs.

Contractors Committee: The mission of the Contractors Committee is to promote and develop activities of interest to the waterjetting contractor. We will encourage contractor involvement by offering programs that address safety, education, and useful technical information. We want to create a forum where technology and ideas can be shared and profited from.

Technology/Research Committee: The objectives of the Technology/Research Committee of WJTA are: 1) To promote the research and development activities in waterjet and related technology. 2) To be an advocate for setting the pace and direction for the future needs in fundamental and applied research in water jet technology. The committee shall also assist the conference chairs of WJTA's biennial water jet conferences in organizing the technology sessions and forums. The committee shall, in cooperation with the International Water Jet Society, promote actively the research/technology symposia, forums, and short courses in the field of water jet science and technology.

Safety Committee: The Safety Committee is responsible for developing, updating and publishing standards and safety recommendations relating to water jets. Consideration is given to the safe operation of high pressure water jet systems, training requirements, care and maintenance of equipment, and accident procedures. The committee has distributed three editions of the publication, ***Recommended Practices For The Use Of Manually Operated High Pressure Water Jetting Equipment***. Similar publications will be developed for other aspects of the water jetting industry.