



Asbestos worker using a servojet water jetting tool to remove asbestos.

Photograph courtesy of Dr. Andrew Conn, Conn Consulting.

7th American Water Jet Conference Fluid Jet Technology In the Service of Industry

August 28-31, 1993
Red Lion Hotel
Sea-Tac International
Airport
Seattle, Washington

- Identify new markets
- Learn the newest fluid jet techniques and applications
- See the largest-ever collection of jetting equipment, components and related products
- See live demonstrations of fluid jet systems and equipment

Whether you are an expert, researcher, or novice in the rapidly growing field of fluid jet technology, the 7th American Water Jet Conference is ideal for you. Meet colleagues from around the world, discuss and exchange ideas on all aspects of fluid jet technology, and take home new ideas to put your company ahead of the competition.

See details beginning on page 3.

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Going, Going...Almost Gone!

The 7th American Water Jet Conference exhibit program is almost sold out for 1993.

If you have not yet reserved exhibit space, please contact Ken Carroll at the Water Jet Technology Association as soon as possible.

Water Jet Technology Association
818 Olive - Suite 918
St. Louis, MO 63101
Telephone: (314)241-1445
Fax: (314)241-1449

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Additives For Water Blasting

Soluble Polymers

Twenty years ago, a polymer-blasting method was developed to remove hard deposits in refinery equipment (a story about its success appeared 11 years later in the May 1984 *Chemical Processing*). The same technique is in use today to solve particularly hard process-cleaning jobs. Jess Keopke of Woods Cross, UT-based Pacific Industrial Cleaning, an Allwaste Company, advises, "Polymer blasting cuts down the cleaning time and does a better job of removing hard scale, like silica scale, from cooling-water heat-exchanger bundles."

The shell side of heat exchangers clean unusually well with polymer blasting. The high velocities with which the polymer molecules strike the substrate surface greatly enhance the usual effects of high-pressure water blasting. In addition, the polymer collimates the water jet, thus improving the cleaning effectiveness in the 9" to 48" range. The exterior of tube bundles fouled deep in the center of the bundle are readily cleaned. A normal water jet could not reach these areas.

Three examples of effective polymer-blasting use follow.

A West Coast company had two inaccessible vertical evaporators, each with 700 1-1/4" OD x 40' stainless-steel tubes that were completely plugged with hard deposits. High-pressure water blasting was ineffective in cleaning the tubes, and plans were underway to replace the evaporators. Polymer blasting (with a special nozzle) successfully cleaned the evaporator tubes in four days during three eight-hour shifts.

A second example relates to a refinery coker unit. To remove coke from 12" ID x 40' pipes with plain water took 12 hours for each 5' of pipe. Polymer blasting (0' to 2' stand-off distance, 10,000 psi, three #8 nozzles (0.067" ID) hand held/rotated) did the same job at the rate of 30' of pipe in four hours - 18 times as fast.

"Cleaning that drain pipe clogged with phenolic resin made believers out of us. We've been using polymer blasting ever since." - Bob Goldsmith

A third example is a 100' section of 10" OD drain line in a chemical plant clogged with phenolic resin. Bob Goldsmith of Goldsmith Painting & Cleaning, Inc., in Sheboygan Falls, WI, says, "A self-propelled sewer lance (with multiple jets; two forward, 10 back at about 10,000 psi) with plain water would make a 2" to 3"-diameter hole in the bottom of the pipe. The first time the pipe was cleaned using polymer blasting, five drums of pulverized resin with the size consistency of pebbles were removed. Polymer blasting totally cleaned the 10" pipe all the way to the skin."

Goldsmith continues, "The effectiveness of polymer blasting comes from the fact that it reaches out further (than plain water) and the water stays cohesive. Once the jet hits, it doesn't explode, but retains its cutting ability. Cleaning that drainpipe clogged with phenolic resin made believers out of us. We've been using it ever since."

Another advantage of polymer blasting is that the volume of fluid needed is substantially less than when using water alone; waste disposal after industrial cleaning is also less expensive. The polymer additive decomposes naturally in water and is non-toxic. However, it is slippery, so the cleaning area can constitute a slipping hazard.

Polymer blasting is less effective on soft buildups such as wax, grease or oil. In these areas, a heavy-duty industrial cleaner (detergent) and water still produce the best results.

(continued on page 4)

7th American Water Jet Conference

Fluid Jet Technology In The Service Of Industry

August 28-31, 1993

Red Lion Hotel

Seattle, Washington

RESEARCH & DEVELOPMENT PAPERS

Over 90 scientific papers covering a wide range of topics, including jet material interaction; modeling and parametric studies; mining, drilling, construction, novel, and miscellaneous applications; jet mechanics; high pressure technology; water and abrasives; and surface coatings removal.

FLUID JET TECHNOLOGY SHORT COURSE

An optional one-day course on the fundamentals of fluid jet technology. Presented by a team of leading educators, the course covers the basics of fluid jets, including an historical perspective, the fluid mechanics of various types of jets, and basic jet performance, equipment, and applications.

CONTRACTOR'S WORKSHOP

A full-day seminar designed specifically for the water jetting contractor and user. Topics include safety standards and requirements, surface preparation, jetting and the environment, repair and cleaning.

MANUFACTURER'S WORKSHOP

A full-day symposium especially for manufacturers involved in fluid jet technology. Topics include process control, advanced machining methods, automated water jet systems, new components/processes for applications in the automotive and aerospace industries, advanced materials machining, jet assisted machining of metallic materials, and adaptive control methods for on-line process control.

FIELD DEMONSTRATION AND TECHNICAL TOUR

A tour of several firms specializing in fluid jet systems. See live field demonstrations of systems and equipment at each site.

TECHNICAL EXHIBIT

Plan ahead to get the most out of this market place of high tech fluid jet equipment and supplies. Learn about new services and equipment that can improve your company's competitive edge.

CONFERENCE PROCEEDINGS

Each full or combo Conference registrant will receive one (1) hardbound copy of the complete Conference Proceedings. Extra copies will also be available for purchase. The Conference Proceedings contain all the papers, complete with illustrations and photographs, presented during the Conference.

HOTEL ACCOMMODATIONS

The Red Lion Hotel is the official hotel for the 7th American Water Jet Conference. Reserve your hotel accommodations now to take advantage of the low group room rates of \$92 single occupancy or \$107 double occupancy. To reserve your room(s), use the convenient form on page 6 or call the hotel directly at (206)246-8600. Be sure to identify yourself as a participant in the WJTA Conference.



Water jetters from around the world watch field demonstrations of systems and equipment.



See the latest water jetting equipment, products, and services on display in the WJTA Conference Exhibit Hall.

More on page 6

Additives For Water Blasting, from page 2

In general, a time savings of 30% to 35% can be expected with polymer blasting over conventional methods of high-pressure cleaning. However, there is a corresponding increase in expense due to the handling and use of the polymer. "Because of cost, polymer blasting is still not used on normal cleaning jobs," Keopke says. "If the cleaning job can be done with normal pressure (10,000 psi) in four hours, most likely, polymer cleaning won't be used." He adds, "For longer jobs, the savings are not only in cleaning time, but in the time the process equipment is out of service. Getting equipment back on-line quickly can sometimes result in savings of thousands of dollars an hour."

Water Soluble Abrasives

Water-soluble abrasives can be used with conventional high-pressure water-blast pumps. Using water-soluble abrasives in water-blast cleaning facilitates:

- the use of lower pressures and of flow rates,
- tighter control of the high-pressure blasting through the reduction of the jet reactive force, and
- a marked decrease in post-job cleanup compared to sandblasting because the water-soluble abrasive shatters upon impact into a fine powder which rapidly dissolves in the water stream.

Sandblasting is quickly losing favor as an industrial cleaning tool particularly in areas that do not meet the National Ambient Air Quality Standards. Water-soluble abrasives present marked advantages over the use of sand. If the material being removed is toxic or requires special handling following its removal from a surface, water blasting with water-soluble abrasives reduces the amount of material that must be later transferred to a suitable disposal site. Because the water-soluble abrasive dissolves in the water, simple filtration can readily separate the removed material.

Reprinted by permission of the publisher from the March 1993 *Chemical Processing* article, "New ideas, tried-and-true methods boost cleaning efficiency," by Senior Technical Editor Alan E. Hodel.



Finally. Pipe Valves Up To 15,000 PSI

Butech introduces a line of pipe valves, fittings and accessories that really handle the pressure.

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Seven Easy Ways To Attend the 1993 WJTA Conference

- 1. FULL CONFERENCE:** Includes admission to all technical and scientific sessions (except Short Course), exhibition, coffee breaks, luncheons, receptions, banquet, and technical tour and demonstration. **Each full registrant also receives one hardbound copy of the Conference Proceedings.**
- 2. COMBO:** Includes everything listed under Full Conference **PLUS** admission to the Water Jet Short Course.
- 3. SAVE \$ ON MULTIPLE EMPLOYEE FULL/COMBO REGISTRATIONS:** Companies that purchase three or more full or combo registrations receive a special discount for each additional employee registered after the first two. To take advantage of the special discount, register the first two (2) employees from your company at the regular FULL/COMBO rates and receive the discounted rate for the third and subsequent employee registrations.

- 4. DAILY ATTENDANCE:** Includes admission to all technical and scientific sessions, exhibition, coffee breaks, and luncheon for one day. Daily registration on Tuesday also includes the technical tour and demonstration.
NOTE: The official Conference Proceedings and admission to receptions and/or banquet are **NOT** included in the daily registration fee. The Proceedings and tickets to the receptions/banquet must be purchased separately.
- 5. WATER JETTING SHORT COURSE:** Includes the manual *Fluid Jet Technology - Fundamentals and Applications*, coffee breaks, and luncheon.
- 6. EXHIBIT HALL ONLY:** Includes admission to the WJTA Exhibit Hall where you'll see water jetting equipment, supplies, and services on display.

- 7. TECHNICAL TOUR ONLY:** Includes round-trip bus transportation, luncheon, and admission to company sites where you'll see live water jetting demonstrations.

CANCELLATION POLICY

Fees will be refunded in full for cancellations received at least six weeks prior to the Conference. Cancellations received more than 21 days and less than six weeks prior to the Conference will be subject to a \$50 charge. No refund will be made for cancellations received less than 21 days prior to the Conference. However, substitutions may be made at any time.

Discounts for WJTA members and early-bird registrants!

WJTA members receive a special discount off the regular registrations fees. You will also receive a special additional discount if your registration is postmarked or received in the WJTA office by August 1, 1993.

RED LION HOTEL

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7th American Water Jet Conference August 27-31, 1993

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|--|----------|
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| <input type="checkbox"/> Double (Two people, One bed) ... | \$107.00 |
| <input type="checkbox"/> Queen Double (Two People, Two beds) | \$107.00 |
| <input type="checkbox"/> Triple (Three people, Two beds) . | \$122.00 |
| <input type="checkbox"/> Quad (Four people, Two beds) ... | \$137.00 |
| <input type="checkbox"/> Rollaway | \$15.00 |
| <input type="checkbox"/> Request upgrade, if available | |
| ADD | \$10.00 |
| (Circle One: Tower or Lakeview Room) | |

Names of additional person(s) sharing room*

1. _____
2. _____
3. _____

*Only one room per form please.

PLEASE NOTE: Reservations received after 8/6/93 are subject to availability. Guaranteed reservations must be cancelled by 6 p.m. on day of arrival to avoid being charged first night's room and tax.

THREE EASY WAYS TO REGISTER

BY PHONE



Just call (314)241-1445 and have your credit card information ready. (MasterCard/VISA ONLY).

BY FAX



Here's our 24-hour FAX number for your convenience (314)241-1449. Fill out the registration form with your credit card information.

BY MAIL



Fill out the registration form and mail with applicable payment to:

WJTA
818 Olive Street - Suite 918
St. Louis, MO 63101 USA



I want to learn the latest water jet technology developments and applications. Please register me for the 7th American Water Jet Conference!

Name: _____ Title: _____
Company: _____
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Information for name badge: _____
(give name as you wish it to appear on badge)

PAYMENT METHOD

☐ Check enclosed payable to 7th American Water Jet Technology Conference (U.S. DOLLARS ONLY).

☐ MasterCard ☐ VISA

Credit Card Number

Exp. date

Print name as it appears on card

Signature (required for validation of payment)

**Join the Water Jet Technology Association now and receive
a substantial discount off Conference registration fees.**

WJTA MEMBERSHIP ☐ \$50 Individual membership ☐ \$350 Corporate membership = \$ _____

7th American Water Jet Conference Registration Form

	WJTA MEMBER		NONMEMBER*		
	<i>Before 8/1/93</i>	<i>After 8/1/93</i>	<i>Before 8/1/93</i>	<i>After 8/1/93</i>	
<input type="checkbox"/> Full Conference ONLY	\$440	\$470	\$490	\$520	= \$ _____
<input type="checkbox"/> Combo (Full Conference and Water Jet Short Course)	\$610	\$640	\$660	\$690	= \$ _____
<input type="checkbox"/> Daily (check day)	\$175/day	\$190/day	\$195/day	\$210/day	
<input type="checkbox"/> Sunday <input type="checkbox"/> Monday <input type="checkbox"/> Tuesday	_____ days × \$ _____				= \$ _____

MULTIPLE CORPORATE REGISTRATIONS

(Applies to third and subsequent registrants from same company)

<input type="checkbox"/> Full Conference ONLY	\$365	\$395	\$415	\$445	= \$ _____
<input type="checkbox"/> Combo (Full Conference and Water Jet Short Course)	\$535	\$565	\$585	\$615	= \$ _____

OPTIONAL

<input type="checkbox"/> Water Jet Short Course ONLY	\$225	\$240	\$250	\$265	= \$ _____
<input type="checkbox"/> Extra Banquet Tickets _____ @	\$ 55	\$ 60	\$ 55	\$ 60	= \$ _____
<input type="checkbox"/> Exhibit Hall Admission ONLY	\$ 20	\$ 20	\$ 20	\$ 20	= \$ _____
<input type="checkbox"/> Technical Tour & Demonstration ONLY	\$ 85	\$ 95	\$ 85	\$ 95	= \$ _____
<input type="checkbox"/> Extra Conference Proceedings (1 copy included in Combo and Full registration packages)	\$125	\$125	\$150	\$150	= \$ _____

☐ **Special Offer:** Register for the 1993 Conference
and pay only \$95 for extra copies of the
Conference Proceedings! Offer valid thru 8/31/93

SAVE \$30

_____ Copies × \$95.00 = \$ _____

*Non-WJTA members who are members of the International Society of Water Jet Technology are permitted a 5% discount off nonmember registration fees.

*Full-time students may register at a 50% discount off nonmember registration fees.

TOTAL ENCLOSED \$

Boeing Demonstrates New Waterjet System for Production On 777 Aircraft

Boeing Commercial Airplane Group has demonstrated its new robotic waterjet cutting system, featuring an abrasive waterjet manufactured by Flow International Corporation (*FLOW*) integrated with a six-axis gantry robot from ASI Robotic Systems, Jeffersonville, Indiana.

Boeing will utilize the machine at its new 432,000 square-foot Composite Manufacturing Center at the Frederickson Site in Pierce County, Washington. The system will cut parts for the empennage – the horizontal stabilizers and vertical fin, and other large graphite/epoxy composite parts for the new 777 twinjet.

The system will reduce tooling and parts handling associated with production of the empennage, and eliminate secondary machining operations. Empennage parts trimmed by the abrasive waterjet will move from the cutting table directly to paint and assembly.

The system stands inside a work envelope measuring 50 feet by 8 feet by 3 feet in the X, Y, and Z axis respectively. Components include: A *FLOW* 20X 100 horsepower dual intensifier pump operating at 50,000 pounds per square inch (psi); a specially designed *PASER*™ abrasive waterjet cutting head; and an ASI gantry robot.

Flow International Corporation is the world's leading manufacturer of ultrahigh-pressure waterjets for industrial cleaning, cutting and HydroMilling® services.

Berkeley Chemical Announces Exclusive Distributorship

Berkeley Chemical Research, Inc. has announced that exclusive distributorship agreements have been made for the sales/marketing of Super-Water® concentrated industrial water blasting additive. For France and Switzerland, contact: M. Daniel Weber, Chief Executive Officer, Weber Lubrifiants, S.A., B.P. 46, 68170 Rixheim, FRANCE, Phone: (33)89 65 40 70, Fax: (33)89 44 90 06. For Spain, Portugal and Italy, contact: Julio Gandara, Alcan International, S.A., Federico Salmon, 3, 28016 Madrid, Spain, phone: (011)341 359 02 38, fax: (011)342-350 16 84.

**See you at the
7th American Water
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**August 28-31, 1993
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Water-Jet Seminars Offered By NLB

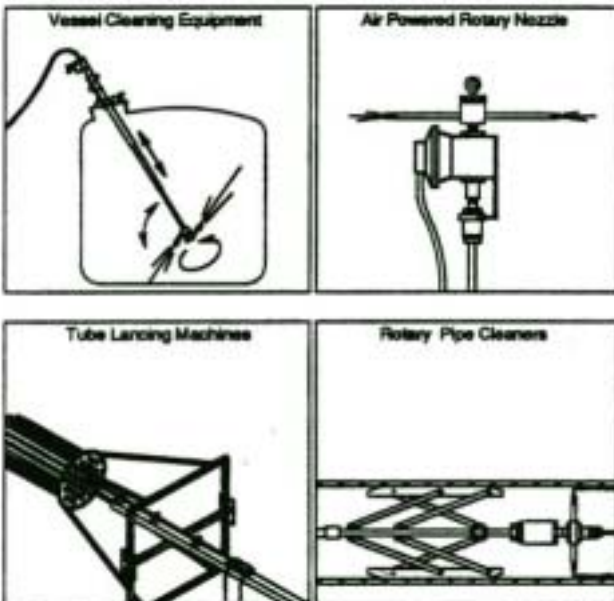
National Liquid Blasting Corporation (NLB) is now conducting training seminars for operators and managers involved in high-pressure water-jet cleaning. Each two-day course covers equipment, accessories, applications, safety procedures, and the latest water-jet technology developments.

NLB has drawn on its more than 20 years of high-pressure water-jetting experience to prepare five training modules that are equally beneficial to equipment operators, their supervisors and managers, and individuals considering the opportunities of water-jetting contracting.

All seminars are conducted at NLB's training facility in its corporate headquarters near Detroit. The course fee includes all training materials, breakfasts and lunches. Discounts are available for companies enrolling three or more participants. For further information contact David Yared, NLB Corporation, 29830 Beck Road, Wixom, MI 48393-2824, telephone: (313)624-5555, fax: (313)624-0908.



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Call for Nominations

The Nominating Committee hereby solicits nominees to serve on the Water Jet Technology Association's (WJTA's) Board of Directors. The Board will be elected at the meeting of the WJTA members held during the 7th American Water Jet Conference in August in Seattle. Send nominations to:

**Nominating Committee
c/o Water Jet Technology
Association
818 Olive Street, Suite 918
St. Louis, MO 63101 USA
Phone: (314)241-1445
Fax: (314)241-1449**



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The Water Jet Technology Association's

7th American Water Jet Conference

August 28-31, 1993

Red Lion Hotel - Sea Tac Seattle, Washington

Preliminary Schedule of Events

SATURDAY, AUGUST 28

8:30 a.m. - Noon

Noon - 1:30 p.m.

1:30 p.m. - 4:30 p.m.

6:30 p.m. - 8:00 p.m.

Cutting Applications

Water Jetting Short Course

Luncheon for "Short Course"
Participants

Short Course (*continued*)

Welcoming Reception

SUNDAY, AUGUST 29

8:30 a.m. - 11:30 a.m.

8:30 a.m. - 11:30 a.m.

11:30 a.m. - 5:00 p.m.

12:30 p.m. - 1:30 p.m.

1:30 p.m. - 4:30 p.m.

1:30 p.m. - 4:30 p.m.

4:30 p.m. - 6:00 p.m.

6:00 - 7:30 p.m.

Water Jetting Contractors and Users
Workshop

Presentation of Scientific Papers

Exhibits Open

Luncheon in Exhibit Hall

Contractors Workshop (*continued*)

Presentation of Scientific Papers
(*continued*)

WJTA Biennial Business Meeting

Reception in Exhibit Hall

MONDAY, AUGUST 30

7:30 a.m. - 5:00 p.m.

8:30 a.m. - Noon

8:30 a.m. - Noon

Noon - 1:30 p.m.

1:30 p.m. - 4:30 p.m.

1:30 p.m. - 4:30 p.m.

6:00 p.m. - 11:00 p.m.

Exhibits Open

Symposium on Manufacturing
Applications

Presentation of Scientific Papers

Luncheon in Exhibit Hall

Symposium (*continued*)

Presentation of Scientific Papers
(*continued*)

President's Reception and Awards
Banquet Cruise

TUESDAY, AUGUST 31

7:30 a.m. - 10:30 a.m.

8:30 a.m. - Noon

12:15 p.m. - 6:15 p.m.

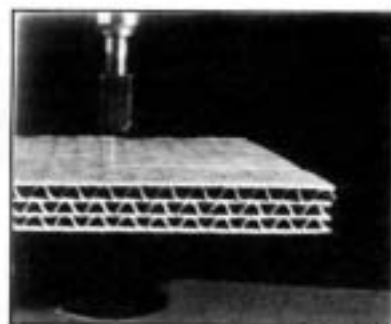
Exhibits Open

Presentation of Scientific Papers

Technical Tour and Field
Demonstrations

Learn about these
and other applications
at the

7th American Water Jet Conference



Cutting Applications

Photo courtesy of Ingersoll-Rand Waterjet
Cutting Systems



Cleaning Applications



Mining Applications

Photo courtesy of the University of
Missouri-Rolla High Pressure Water Jet
Laboratory

The 7th American Water Jet Conference is endorsed by the International
Society of Water Jet Technology.

Prize to be Awarded for Best Paper

The Water Jet Technology Association will offer a prize for the best paper presented at the American Water Jet Conference. The first award will be made for the best paper presented at the 6th American Water Jet Conference held August 24-27, 1991, in Houston, Texas. This award will be presented at a banquet on Monday evening, August 30, 1993, held in conjunction with the 7th American Water Jet Conference in Seattle, Washington.

The prize will be in the form of a plaque donated by Rogan and Shanley, Inc., of Houston, Texas. The purpose of the award is to signify peer acknowledgement of excellence in the presentation of a paper at the American Water Jet Conference. The selection of the first award will be made by the organizing committee of the 7th American Water Jet Conference and will be based solely on the quality of the papers published in the *Proceedings of the 6th American Water Jet Conference*. All subsequent awards will be selected by the Board of Directors of the Water Jet Technology Association.

Criteria to be considered in the selection of these awards will include an evaluation of the quality of the oral presentation as reflected in the results of a questionnaire made available to attendees at all sessions of the Conference, the degree to which the paper follows editorial guidelines, the originality of the content of the paper, the absence of advertising in the paper or presentation, and the value of the contribution to the state of the art of water jetting.

Send Us YOUR News!

Water Jet Technology Association
ATTN: Dr. George Savanick
818 Olive Street - Suite 918
St. Louis, MO 63101-1598, USA
Phone: (314)241-1445
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Performance UNDER PRESSURE



To illustrate a point, Butech ball valves are the ultimate in design and performance. Our 316 cold drawn stainless steel construction assures long lasting pressure performance. The blow-out proof stem and ball design, with 1/4 turn positive shut-off, guarantees precise control of liquid or gas flow up to 20,000 psi. A variety of configurations and end connections are readily available.

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