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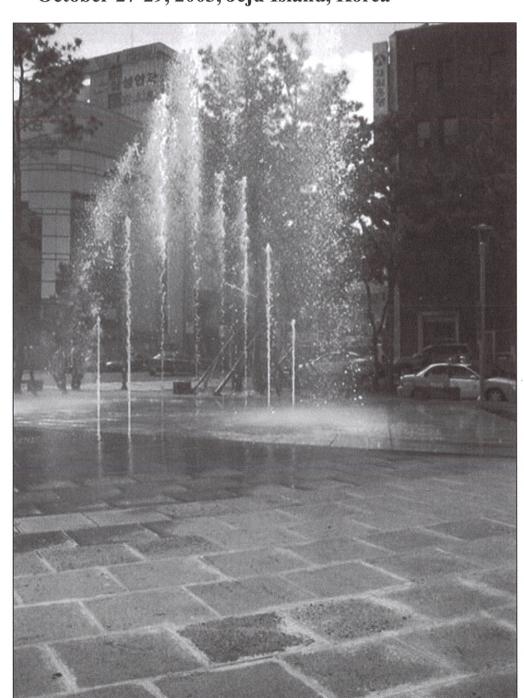


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WaterJet Technology Association for the benefit of its members

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7th Pacific Rim Conference on Water Jetting Technology October 27-29, 2003, Jeju Island, Korea



On Jeju Island waterjets are also used for beautification and fun. Dancing fountains are there where teenagers try to run between the streams without getting wet. These dancing fountains are especially beautiful during night hours when light illuminates the fountains dancing to synchronized music. Photo courtesy of Grzegorz Galecki, Ph.D., University of Missouri-Rolla.

See page 2 for more highlights of the 7th Pacific Rim Conference.

On the inside

7th Pacific Rim Conference pg.2 Summary of Papers at the SSPC Conference pg.4 Flow Appoints Stephen Reichenbach Welcome New WJTA Members ... pg.11 Safety Committee Solicits Comments pg.13

7th Pacific Rim Conference on Water Jetting Technology, from page 1

he 7th Pacific Rim International Conference on Water Jetting Technology organized by the Korean Society of Water Jet Technology (KSWJT) and co-organized by the Korean Society for Geosystem Engineering (KSGE), the Water Jet Technology Society of Japan (WJTSJ) and Korean Fluid Machinery Association (KFMA), was held in Jeju, Korea, October 27 to 29, 2003.

Grzegorz Galecki, Ph.D., attended the conference, and he reports that there were sixty-four abstracts, fiftyone papers plus four posters, and over one hundred participants representing nine countries.

The next Pacific Rim Conference will be in China in 2006.

Keynote Lectures

• Waterjet technology use and development in the automotive industry

> Dr. Mohamed Hashish Flow International Corp., USA

• Development of erosion models for abrasive waterjet machining

> Prof. Thomas J. Kim University of Rhode Island, USA

• High-velocity water jets - in air and under submerged environments

> Prof. Seiji Shimizu Hiroshima Institute of Technology, Japan

• Current state and future prospects of the water jet technology in the construction industries

Dr. Teruo Yahiro Toyo Consultant Corp., Japan

• Application of water jet technology to industry in Korea -Current situation and perspective

Prof. Chung-In Lee Seoul National University, Korea

Papers Presented

Fundamentals

Velocity measurement of abrasive water injection jet by PIV

Seiji Shimizu, Shinji Kumagai

The experiment equipment design and study on submerged abrasive waterjet

Yuan-lin NING, Shou-Gen Hu, Ji-Fei Gao, Xu-Ping Jiang

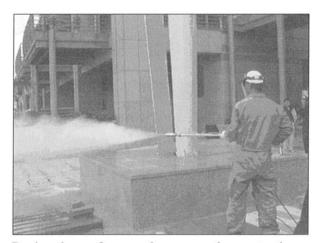
Roughness measurement of disc kerf walls created by abrasive water jet in rock and concrete blocks

Jea-Joon Song, Jung-Gyu Kim, Ki-Yoon Bae, Chul Hong Kwak

(continued on page 10)



Opening remarks by Prof. Chung-In Lee, Seoul National University. Photo courtesy of Grzegorz Galecki, Ph.D., University of Missouri-Rolla



During the conference, there was a demonstration of high pressure cleaning equipment. Photo courtesy of Grzegorz Galecki, Ph.D., University of Missouri-Rolla.

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7th Pacific Rim Conference on Water **Jetting Technology,** from page 12

Cavitation Jets

Peen forming by using a cavitating jet in air Hitoshi Sovama, Kenichi Saito

Effect of salt water on cavitation impact load in submerged jet

Motohiro Yokota, Hitoshi Soyama, Hiromi Mochizuki, Masahiro Gotou

Water jet in-process dressing

Hironori Katayama, Masaki Izawa, Nobuaki Iguchi, Naoki Asakawa, Masatoshi Hirao

Removal of plasma sprayed ceramic coatings by plain water jets

Liang Ding, Seiji Shimizu, Mitsuo Kido

Poster Presentations

Study on control of abrasive flow rate in abrasive water suspension jet

Chuwen Guo, Xiong Duan, Hiroshi Katakura, Ryuichiro Yamane

Concrete and rock cutting using modulated waterjets

Libor Sitek, Josef Foldyna, Jiri Scucka, Lenka Bodnarova,

Measurement of dynamic pressure and force effects of modulated water jet

Josef Foldyna, Libor Sitek, Pavel Jekl, Branislav Svehla

Technique and technological capabilities of water-jet cutting equipment available at RFNC-VNIITF

Evgeny T. Antoshin

Safety Committee Solicits Comments On Improvements To Recommended Practices

he WJTA Safety Committee solicits comments regarding improvements to the publication, Recommended Practices for the Use of Manually Operated High Pressure Waterjetting Equipment. While the Recommended Practices is reviewed periodically at the biennial conferences of the WaterJet Technology Association, your comments and suggestions for im-proving the publication are invited and welcome anytime.

Please address your comments and suggestions to: Safety Committee, c/o WJTA, 917 Locust Street, Suite 1100, St. Louis, MO 63101-1419, fax: (314)241-1449, e-mail: wjta@wjta.org, web site: www.wjta.org.

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7th Pacific Rim Conference on Water Jetting Technology, from page 10

Production

Ouantitative and comparative study of abrasive contamination in ductile and brittle material for abrasive aqua jet machining (AAJM)

Kevukumar J. Patel

Development and application of fluid jets accompanied by thermal phenomena (A Review)

Hiroshi Kivohashi, Kivohiko Okumura, Mamoru Abe

Some aspects of hydroabrasive suspensive jet cutting of aluminum alloy

Andrzej Perec

Improvement in performance of gear form grinding with jet flow technology

Satoru Ezoe, Koso Nagao

Surface Treatment

Novel technology of water pipeline cleaning using high pressure water

Przemyslaw Borkowski

Fundamentals of surface treatment with high-pressure abrasive-water

Przemyslaw Borkowski

Polymer removal in pipe inside by ultra high pressure waterjet cleaning

Makoto Kuroda, Wonho Kang

Abrasive wateriet machined surface characteristics of titanium alloy (Ti6A14V)

Y. W. Seo, D. W. Kim, M. Ramulu

Civil/Mining

Efficiency of concrete removing with water jet technology

Masao Minabe

Concrete substrate preparation with waterjets for repair and strengthening of concrete

G. Galecki, N. Maerz, A. Nanni, J. Myers

Bond characteristics of interfaces between construction materials and concrete surface treated by water jet method

Shigemi Sakoda, Hidetaka Suzuki, Ichiro Adachi, Hidevuki Utsumi, Li Ying

Influence of the mix proportion of the aggregate for concrete by water

Masafumi Akiyama, Li Ying, Tomoki Sakurai, Sigemi Sakoda, Ichiro Adachi

jet technology in surface treatment

High-quality aggregate reproduction method using water jet

Takahisa Isobe

Drilling of rocks using an abrasive suspension water jet

Ho Young Seo, Song S. Han, Chung-In Lee

Disc cutting in granite and concrete with abrasive suspension jet

Song S. Han, Chul Hong Kwak Chung-In Lee

A waterjet system utilizing cuttings as abrasives for cutting hard rocks with moderate pressure

Koji Matsuki, Akihisa Kizaki, Ryuta Togasawa

Abrasive water jet perforation - An alternative approach to enhance oil production

Gensheng Li, Jilei Niu, Jian Song, Zhongwei Huang



Closing remarks by Prof. Chung-In Lee, Seoul National University. Photo courtesy of Grzegorz Galecki, Ph.D., University of Missouri-Rolla.

A study on the effectiveness of an abrasive suspension water jet applied to a microtunneling machine

Jung-Guen Kim. Tae-Dong Park

The experimental study on oil & gas well casing cutting with abrasive wateriet

Weidong Zhou, Ruihe Wang, Yongyin Yang, Yuhuan Bu

Behavior of high-speed pulsed water jet in the air and its drilling effect on metal

Katsuhiro Yamamoto, Norihisa Handa Kazuyoshi Harada, Makoto Iwase

Study on rock breaking mechanism during swirling water jet drilling

Ruihe Wang, Hongjian Ni, Weidong Zhou

Numerical simulation of the flowing field of high pressure jet impinging the bottom-hole

Gensheng

Bifurcation of steady state solution of cavitating flow through converging-diverging nozzle

Feng-hua Zhang, Xiao-qi Zhang, Chuan-lin Tang

(continued on page 13)

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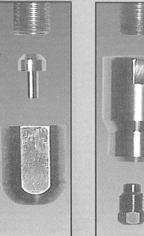




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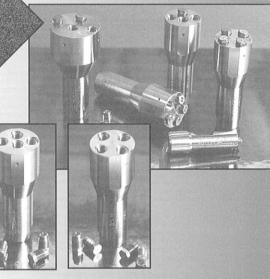
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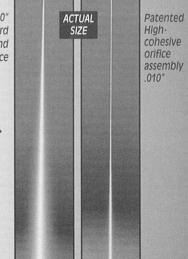


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Summary of Papers at the SSPC 2003 Conference Dealing With Surface Preparation Methods, Waterjetting, Wet Abrasive Blasting, And Environmental Issues

Prepared by Lydia Frenzel, Ph.D.

The full papers can be purchased on CD-ROM from www.sspc.org.

Coating Types

1. Is There an Alternative to Abrasive Blasting?

Peter K. Fisher Rust-Oleum Corporation Vernon Hills, IL

Compared Acrylic elastomeric to Zinc/epoxy/polyurethane and to other coating systems. Lots of comparison data. Both the acrylic elastomeric coating and the surface preps involving water provided cost savings.

Surface Preparation

2. Business Elements Of Getting Into UHP Waterjetting

Rick Schmid
Market Manager Surface
Preparation Systems
Flow International Corporation
Kent, Washington USA

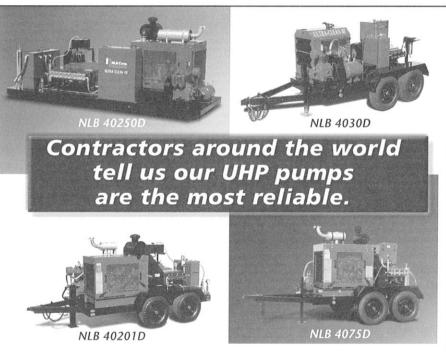
Several sections to the talk. Most people have more than one pump. Robotic rate is typically 300 sq ft/hour on hard marine paint, 600 sq ft/hour on industrial tank paint including time to inspect, etc. Production rate is 30-80-100 sq ft/hour on open hand lance; Robotics is 240-1000 sq ft/hour.

Capital Investment Required - The most typical system purchased to start in the business is one 200 hp pump, two hand held lances, 300 ft of UHP hose and a group consumable parts to operate the equipment for 3 - 4 months. The cost of a system like this is \$135,000 to

\$150,000. If robotics is added to this system there is an additional \$250,000 cost. These prices should be considered as only approximations.

Daily checks include oil and lubricants. Figure on 200 hours lifetime for seals and check valves. Check lance daily for leaks. Nozzle inserts- 8-40 hours- check each shift; Swivel seals 10-20 hours. Training charts are available from manufacturers to put in production rates, complexity, labor costs, etc. for bid estimation.

(continued on page 7)



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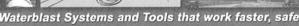
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Page 4 WJTA on the web: www.wjta.org December 2003 December 2003 WJTA on the web: www.wjta.org Page 11

7th Pacific Rim Conference on Water Jetting Technology, from page 2

Abrasive waterjet machining: A cost effective process for polymer composites

Y.W. Seo, M. Ramulu, P. Posinasetti, M. Hashish

Changing jet structure to increase vacuum pressure of jetting vacuum

Chuan-lin Tang, Xiao-qi Zhang, Feng-hua Zhang, Lin Yang, Zhen-fang Liao

The experimental study on the effective injection angle of the water jet cutting

Hong Jun Wu, Satosi Manabe Yoshiharu Kiritani, Keniti Nakaguro The natural frequency characteristics of the self-excited oscillating pulsed waterjet nozzle

Lin Yang, Chuanlin Tang, Fenghua Zhang

Special Applications

Study on drying sludges by thermal iet dryer

Naohito Havashi, Sohei Shimada Hideyuki Umehara

The ability of abrasive waterjets to penetrate through building rubble for firefighting and survivor detection

Samir Dorle, David A. Summers, Anuj Gupta, Grzegorz Galecki

Waterjet cutting - an advanced method for cutting sandwiches

Franz H. Trieb

The use of simplified tools for helping deal with the presence of landmines

David A. Summers, Grzegorz Galecki, Robert Fossev, R. Joe Stanlev, Samir Dorle, Sanjeev Agarwal, Robert Mitchell, Darvl Beetner

(continued on page 12)

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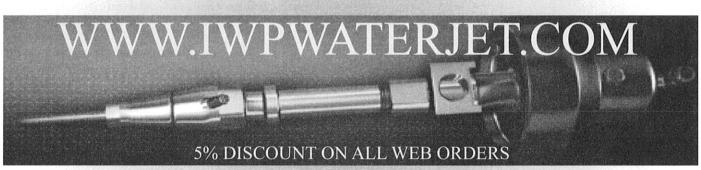
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Flow International Appoints Stephen D. Reichenbach VP & CFO

Tow International Corporation (Nasdag: FLOW) has announced the appointment of Stephen D. Reichenbach as Vice President and Chief Financial Officer. Reichenbach will oversee all of FLOW's financial functions from the company's headquarters in Kent, Washington, and report directly to Stephen R. Light, FLOW's President and Chief Executive Officer.

Reichenbach previously served as Flow International's CFO from 1996-2001, when he was appointed CFO of the company's wholly owned Avure Technologies subsidiary. He has served in the additional capacity of interim CFO of Flow International since November 2002

"Steve brings a thorough knowledge of FLOW's diverse operations, personnel, markets and challenges to the role of CFO," said Stephen R. Light, Flow's President and Chief Executive Officer. "I believe that Steve's positive relationships with our lenders and investors will yield prompt benefits as we undertake the numerous restructuring initiatives and improvement projects already

Best wishes for a Happy, Healthy and Safe New Year from the WITA Officers, Board of Directors & Staff!

underway, and as we begin to resume profitable growth during the next two vears and well into our future."

Reichenbach joined Flow International in September 1992 when the company acquired Spider Staging Corporation. He was appointed

Treasurer in March 1993, Vice President of Finance in 1996, and Executive Vice President in March 1997. Before joining FLOW, Reichenbach served as Controller at Spider Staging Corporation, and was an accountant with Ernst & Whinney.



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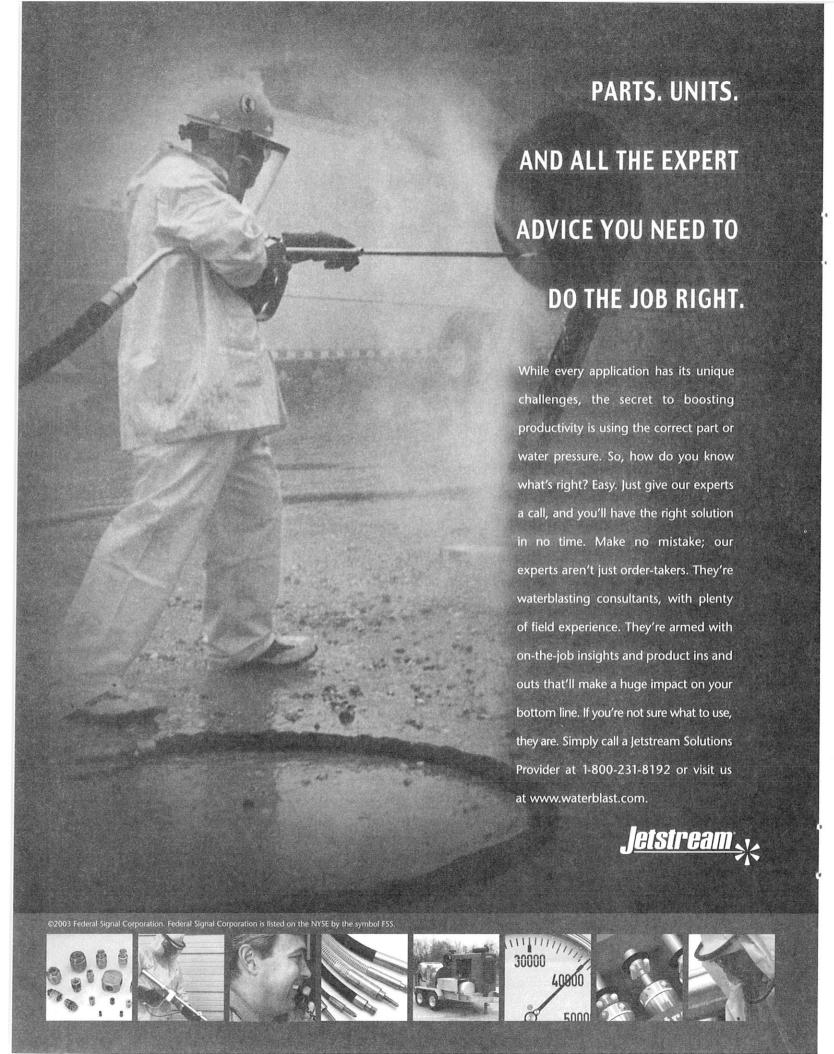
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Summary of Papers at the SSPC 2003 Conference Dealing With Surface Preparation Methods, Waterjetting, Wet Abrasive Blasting, And Environmental Issues, from page 8

Fairly General Paper. Uses ICRI profile criteria. Includes a table comparing 16 different processes.

8. Selecting A Surface Preparation Method For Optimum Adhesion And Performance On Concrete Floor Surfaces

> Jeremy Kissinger Allen E. Slater **Product Specialists** An International Surface Preparation

Company, North America Compares shotblasting,

diamond grinding, and scarifier with adhesion and costs to complete surface prep. Scarifier pull showed that concrete had been damaged. Shot blaster is 250-10,000 sq ft/hour- for cost of \$0.005 - \$.05 per square foot. Diamond Grind was 100-1000 sq ft/hour for coast of \$0.06-\$0.08 per sq foot. Scarification was 100-400 sq ft per hour for a cost of \$0.06 to \$0.10 per square foot.

9. Removal of Coating from Concrete Floors Using UHP Water Jets

> J.Van Dam Marketing Communications Manager **NLB** Corporation Wixom, Michigan

Good synopsis of advance in technology so that waterjet can be used. No economics. Showed heavy, medium, and light profiles.

10. Workshop on Salts

Jerry Colahan Chlor*Rid

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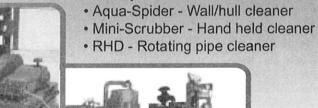
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