



Trenchless Technology Center *Newsletter*

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Students See Pipe Bursting Firsthand

TTC faculty and students had the pleasure of visiting a pipe bursting project recently that only required a short walk from the classroom to the site. Local contractor Jabar Construction, with subcontractor Insituform Technologies, was the low bidder for trenchless replacement and rehabilitation work in Ruston, La. Jabar conducted the pipe bursting work and Insituform was responsible for the CIPP lining. The project began in late April and by mid-May, the pipe bursting work was under way.



Jabar Construction's pulling box for pipe bursting.

A large group of students and faculty took this opportunity as a break in final exams and grading to view one of the first pipe bursting segments. The segment involved approximately a 400-ft pull of 8-in. HDPE pipe to replace a deteriorated 6-in. clay pipe. The pull included passing through one intervening manhole and proceeded without incident, although the pipe bursting crew admitted to a little stage fright in the presence of such a large audience.



TTC students observe pipe bursting.

Ruston Utilities Director Richard Aillet commented, "It was a pleasure to have the Louisiana Tech students and TTC faculty out for a visit. Sometimes trying to visualize a process from classroom lectures, textbooks and PowerPoint presentations pales in comparison to seeing the process in action."



Ruston Utilities Director Richard Aillet explains trenchless technology to local reporter.

TTC's Director, Ray Sterling added, "This project is a wonderful opportunity to show trenchless technology in action. And, it allows students the chance to discuss the particulars of a situation with the on-site workers."



Sterling Takes Over as ISTT Chairman

TTC Director Ray Sterling became the first North American chairman of the International Society for Trenchless Technology (ISTT) at the recent ISTT International No-Dig Conference in Copenhagen, Denmark. The term of office for ISTT chairman is typically three years and Sterling follows former chairman Ted Flaxman from the U.K., Michel Mermet from France, Rolf Bielecki from Germany and Gert Fischer from Denmark in holding this position. The Society currently has approximately 3,700 members. Currently, 24 countries and regions throughout the world are affiliated members of the ISTT. The North American Society (NASTT) is one of the largest groups in the international society.

"I intend for a particular focus of my chairmanship to be on building ISTT as a focus of international sharing of information on research and education in trenchless technology," Sterling said. "This endeavor will complement the existing strengths of the Society and strengthen the benefits to members and member societies for their participation."

"It will be especially rewarding to be ISTT chairman when the No-Dig International meeting comes to Las Vegas next year. It is a great opportunity for North Americans to see firsthand technologies that are more common overseas; as well as for international visitors to see North American advances and to explore market possibilities."

TTC Industry Advisory Board News

TTC welcomes three new Industry Advisory Board (IAB) members. As an industry representative, Nabil Shehade from Ameron International Corp. joined the board in April. Shehade is the director of business development for Ameron, a multinational manufacturer whose products include water transmission lines, coatings and fiberglass-composite pipe. Shehade is a registered, professional civil engineer and has worked for Ameron since 1980.



Shehade

In addition, two new public works members have recently joined the board. John Redner, from the Los Angeles County Sanitation District, who introduced the "pickle jar" test for coatings and lining materials for manholes and pipes, became a member in early May. Gunars Sreibers, representing King County, Wash., joined in April. He heads the preparations for the extensive sewer improvement program in Seattle and the surrounding areas.



Redner



Sreibers

TTC Municipal Forum News

This spring, the TTC held four of its Municipal Forums in the following cities: Boulder, Colo., Tacoma, Wash., Columbus, Ohio, and Kansas City, Mo. Forums in Boulder and Tacoma focused on manholes and coatings. The sessions included presentations and field demonstrations of various techniques employed by: Neopoxy, APM Permaform, Raven Lining Systems, Suncoast Infrastructure Inc. and Terre Hill Composites.

At the Boulder forum, Dr. Cumaraswamy Vipulanandan from the University of Houston also discussed his research on the deterioration of coatings and other rehabilitation techniques. The daylong meetings were a success and plans were made for new topics for the fall meetings.

With the generous support of the Gulf Coast Trenchless Association (GCTA) headquartered in Houston and Jabar Construction of Ruston, La., the TTC will expand its Municipal Forum Program by establishing two Gulf Coast Region Municipal Forums. One forum will be centered in the Ruston/Monroe, La., area and draw from northern Louisiana, southern Arkansas, northeastern Texas and western Mississippi. The other forum will be located in the New Orleans/Mobile corridor. This forum will attract municipal participants from northwestern Florida, southern Alabama, southern Mississippi and southern Louisiana.

In addition, the TTC will relocate its Houston forum to Austin in order to encompass a broad area of Texas. These changes will result in significant benefits. Public works personnel will continue to attend forum meetings free of charge. Participants will no longer need extensive travel to attend their respective forum. Municipal representatives will be more likely to build strong, collaborative efforts and to share information on the effective use of trenchless techniques with neighboring municipalities.

As always, a key aspect of the forum meeting remains: the afternoon closed session. During this time, public works participants can freely exchange information with each other on their successes and failures. Municipal or other public works personnel interested in participating in one of the forums should contact the TTC to be added to the meeting information mailing list.

Louisiana Tech Faculty Develops Ultrasensitive Microcantilever Sensors for Detection of Environmental Pollution

In the last two years, Dr. Hai Feng (Frank) Ji, a TTC-affiliated professor, has developed a revolutionary sensor concept. Based on the deflection and resonance frequency of microcantilevers, these sensors detect part-per-trillion (ppt) level of particular substances both in air and in solution. This sensor technology has significant applications to the trenchless technology industry.

Sewers and gas pipelines transport numerous substances that are harmful to humans and/or to the structural integrity of the pipeline. Acids in particular are hazardous because they can eat away concrete pipes, some lining systems and metal pipes. Over the past six months, Ji has developed a sensor based on the microcantilever principle that is intended in the future to be implanted in the sewer system and can be monitored online by a central computer. Ji's sensitive sensors will be installed either along the pipe system or on movable inspection platforms and will detect the gas forms of hydrochloric and hydrofluoric acids.

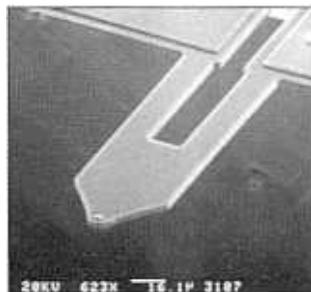
Size and sensitivity of the sensors are additional noteworthy features of the microcantilevers. Ji notes that when, "one hundred microcantilevers are lined up side by side they will span the approximate width of a dime or one centimeter."

The sensors will be able to be implanted into small and large pipes with little disturbance to the interior of the pipe. In spite of

their size, the cantilevers are being developed with heightened sensitivity. Each sensor will be programmed to detect for the presence of two types of gaseous molecules. Each cantilever will recognize the first type of gas molecule. However, the second type of molecule linked to each cantilever is different in order for the cantilevers to accurately detect a harmful gas, each one of the sensors

must indicate its presence. This feature will decrease the incidents of false detection of toxins present in any substance.

Ji has just started Stage II of this project, which centers on the development of a remote sensor system, one that can transmit signals without a direct-wired connection between the microcantilevers and the central computer. Ji notes that, "we are also working on the modification of cantilever with other molecular recognition materials for the detection of liquefied petroleum gas (LPG)."



Electron micrograph of a microcantilever.

Industry Advisory Board

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June 2002

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The TTC Newsletter is published
as a department within
Trenchless Technology magazine.

All newsletter materials are prepared by TTC.
Communications should be
directed to the center.