



Trenchless Technology Center *Newsletter*

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DIRECTOR'S MESSAGE: Innovation, Validation & Education



On Oct. 22-24, the TTC conducted its 24th annual Industry Advisory Board (IAB) meeting at Louisiana Tech University (Tech). This was a very special occasion for me since it was the first one since I returned as the director on July 1. It was also a special time for me to introduce our newest IAB member at that time, National Water Main Cleaning Co. (a Carylton company). Since our IAB meeting, Avanti International, Inc. became our most recent IAB member.

The TTC realizes that making the investment to join our IAB is a major commitment. We take this seriously. We are committed to investing these funds to multiply benefits to the industry. Historically, the money invested in TTC by our IAB members are multiplied four to eight times through research grants, contributions, university in-kind support, etc. Please review our IAB members and sponsors.

The IAB meeting resulted in a time for evaluating the needs and direction of the industry, as well as how TTC has been restructured to meet industry needs. This includes establishing the following senior management team:

- Tom Iseley, Director
- Jadranka Simicevic, Assistant Director
- Shaurav Alam, Research Program Manager
- Fredda Wagner, Financial Manager

This team is supported by a team of research scientists and engineering professors, technicians, graduate students and undergraduate students.

It became clear during the meeting that the TTC vision is on track with its commitment to innovation, validation and education. This is a good fit with the culture at Tech. For example, recently, Louisiana Tech president Dr. Les Guice was in Baton Rouge where he served as emcee for the Louisiana Innovation Council's Award Ceremony for those

organizations selected by Louisiana Economic Development to represent some of the most innovative organizations in the state. He was pleasantly surprised when Louisiana Tech University was recognized by Secretary Stephen Moret for being one of those organizations. He stated that "Tech has a tremendous team that works together every day in supporting innovation, entrepreneurship and partnerships. The work of that team has not only led to significant economic impacts in our region, but has served as a model for the rest of the state."

The TTC plans to leverage off the success of this state-wide model and move it to a national/international platform. It is critical for owners of underground infrastructure systems to meet the needs of their deteriorating assets. Our industry will need to continuously improve our current technical solutions to expand their technical envelope but will also need major technological break-through milestones. To move this commitment forward, industry leaders are in the initial stages of the planning an innovation summit. More will be presented on this during our next TTC newsletter.

Innovation is not the total solution. It is only one component, although a major one, and must be supported by an innovative technology validation program. Validation will provide the user community with the level of confidence that the emerging technical solutions will perform as promoted. Such a program was presented and discussed at the IAB meeting. More details on this program will be provided later.

The TTC IAB also engaged in discussion related to education. This is the third leg of the three-legged stool. Education is critical and it is all encompassing. It includes students at all levels, the general public (rate payers), utility staff and managers, professional service providers,

politicians, etc. This was clearly identified in a research program conducted by TTC in 2007 through our Municipal Forum (MF) program. This involved seven regional MFs. This research was funded through an EPA grant to the Buried Asset Management Institute-International (BAMI-I). TTC is committed to strengthen the bond with major industry professional organizations to maximize our efforts. In addition, TTC will seek out innovative approaches to reach the constituents.

An example of an innovative approach was on Oct. 30 when I had the unique opportunity to speak to the ASCE Civil Engineering Club at Mariette High School in Mariette, Ga.. This was special because these high school students were already informed about trenchless technology. The credit for this awareness goes to Pitts-Flower Enterprises CEO Marcellus Pitts, who reached out to Benjamin Media Inc. for copies of *Trenchless Technology* magazine. It was inspiring to walk into the classroom and see those magazines. Also, for two weeks in November, I will be assisting with five workshops, conferences, etc., in five Asian countries. The major request for information is on topics relating to buried asset management including pipeline condition assessment technologies and pipeline renewal technical solutions.

In the Director's Message in coming newsletters, it is my plan to keep the industry informed of our progress. To have maximum impact we need industry leaders to join our campaign and commitment to advance our industry. We just survived the mid-term elections, which means we are moving into a two-year opportunity to make a difference as our nation prepares for a national presidential election.

Featured TTC Research

Short-Term Pressure Testing of CIPP Liners.

There is a growing demand for the rehabilitation of pressure pipelines such as potable water mains, industrial sewer force mains, large transmission lines, etc., using the cost-effective CIPP lining technology. These applications pose different requirements for the liners than the rehabilitation of gravity pipelines. The CIPP liner in the pressure pipe must be capable of maintaining the internal pressure and holding the external loads without the support from the existing host pipe. The performance of pressure CIPP liners needs to be better understood and confirmed by testing. The TTC recently successfully completed two short-term burst pressure tests (ASTM D1599) of the CIPP liners.

The testing was performed in two 8-in. diameter liner specimens. The ends of one specimen were sealed using custom made end caps filled with polyurea. The other specimen was sealed with mechanical joint caps positioned on the 8-in. steel ring attached on each end of the specimen during lining. A pressure transducer, capable of measuring pressure up to 1,100 psi, was installed on each specimen and pressure was applied using the elevated pressure application device (EPAD) until the liner ruptures. The end caps were held together using a system of threaded rods. Both specimens had the similar rupture pattern, breaking at the spring line (Figure 1), but the bursting pressure was found different, the first sample failed at around 460 psi and the second at 745 psi.

Automation in Creep Data Acquisition.

The TTC is conducting the long-term creep rupture testing (ASTM D2990) of CIPP liners and PVC pipes, over a period of 10,000 hours or until test specimens fail, whichever comes first. Test specimens were prepared in accordance with the ASTM D2990. Strain gauges were attached to the tensile samples to record strain data (Figure 2) and LVDTs were positioned at the middle of the bending samples to record displacement data. Data have been collected automatically using a data acquisition system. The automation was necessary to ensure timely and accurate data recording, with minimum four decimal places to trace any anomalies like sudden change in temperature or humidity. Data collected to date are found interesting.

For additional information regarding these tests please contact Dr. Shaurav Alam (shaurav@latech.edu), Dr. Tom Iseley (dtiseley@latech.edu) or Jadranka Simicevic (jadranka@latech.edu).

TTC Industry Advisory Board (IAB) Meeting

The 2014 IAB fall meeting was held on Oct. 22-24, in Ruston, La., gathering both long-standing and newer members of the Board, TTC staff, associated faculty and students. Several guest visitors attended as prospective members. The next IAB meeting will be held on Jan. 28, 2015, in conjunction with the Underground Technology Conference in Houston,

TTC Municipal Forums

Three forums have been scheduled in the fall 2014: in Long Island City, N.Y. (Nov. 13), Vancouver, Wash. (Dec. 4), and Westminster, Colo. (Dec. 11). The forums are designed as one day programs with low participation cost (\$45 for municipal participants) and all participants can earn CE units for attending (a \$15/certificate fee applies).

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FIGURE 1 The ruptured specimen with polyurea filled caps (top) and with mechanical joint caps (bottom).



Inside environmental chamber: long-term creep rupture testing. (tensile creep testing shown)

Industry Advisory Board

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