

CONTENTS¹

Session 1A: Plenary Session

1A-1. State of the Pipeline Industry

Dr. Tom Iseley, P.E., Science Advisory Board—City of Atlanta

1A-2. Evolution of Trenchless Technologies

Prof. Dr.-Ing. Dietrich Stein, RUHR-UNIVERSITAET BOCHUM

1A-3. Pipeline Infrastructure Security

Jack Fox, Branch Chief—Pipeline Infrastructure Security

Session 2A: Asset Management

Millard (Sandy) Robinson, Jr., P.E, Malcolm Pirnie

2A-1. Implementing a Cost-Effective Buried Infrastructure Asset Inventory

Christopher Heltzel

2A-2. A Decision-Support Methodology for Asset Management

E. Lalonde and C. Bergeron

2A-3. Benchmarking Pipeline Operations and Management

Myron Olstein

2A-4. Asset Management of Waterlines Using Remote Field Technology

William F. Hartman

2A-5P. Comprehensive Planning of Water Distribution Pipe Equipment in Seoul Metropolitan City

Suk Hwan Jang, Tae Yong Choi, Sang Woo Park, Jong Min Oh and Kyung Doo Oh

2A-6P. GASB 34 Asset Reporting Using Information Technology: A Case Study of Norfolk, VA Utilities Department's Approach

Jason D. Jennings, Dwayne Coston, and David A. Jagt

Session 2B: Condition Assessment for Water Lines I

Terry Moy, CH2M Hill

2B-1. Condition Assessment of 60-in. PCCP in Houston, TX

Rafael Ortega, Gregory J. Henry and Robin S. Green

2B-2. Condition Assessment and Performance of 50-Year Old LCP

¹ “P” after paper number stands for Poster Paper.

Rasko P. Ojdrovic, Mehdi S. Zarghamee, Murray Schroeder, and Bradley A. Brooks

2B-3. Condition Assessment of an 84-in. PCCP: A Case Study

Michael Higgins, Kenneth R. Herd, and Michael E. Strully

2B-4. An Overview of Current and Developing Technologies for Pipe Condition Assessment

Alison Ratliff

Session 2C: Corrosion I

Michael J. Szeliga, P.E., Russell Corrosion Consultants, Inc.

2C-1. Evaluating Ductile Iron Pipe Corrosion

Michael J. Szeliga and Debra M. Simpson

2C-2. Ductile Iron Corrosion Factors to Consider and Why

William S. Spickelmire

2C-3. Corrosion Control of Large Diameter Piping Cathodic Protection a Proven Method

Scott Paul and Patrick O'Connor

2C-4. 100% Solids Rigid Polyurethane Coatings Technology and Its Application on Pipeline Corrosion Protection

Shiwei William Guan

Session 2D: Sewer Lines Renewal I

Jon Doane, Black & Veatch Corporation

2D-1. Design Considerations for Improving System Efficiency and Maximization of Service Life

Gary L. Lienberger

2D-2. Mission Possible: Baltimore's Wet Weather Program Challenges

Calvin D. Farr Jr.

2D-3. Criteria for an Effective Lateral Renewal Project Utilizing Trenchless Technology

Larry Kiest, Jr. and Shaun M. Flanery

2D-4. Sanitary Sewer System Rehabilitation – Investigation, Planning, Implementation, and the Theory of Chaos – A Case Study

Wayne A. Schutz

Session 2E: Pipeline Security and Safety I

Dr. Zohreh Movahed, Washington Suburban Sanitary Commission (WSSC)

2E-1. Lessons Learned from Utility and Infrastructure Vulnerability Assessments
Milton Hunter, Rochelle Chernikoff, Tom Wood and Mike Malvey

2E-2. Automated Surveillance for Water Utilities
Myron Shenkiryk

2E-3. Applying Security and Vulnerability Assessments to Large Water Wholesaling Agencies
Patrick T. Huston, Donald R. Kendall, Bruce W. Fischer, Susan Mulligan and Sandra Carlson

2E-4. Application of Integrated Control Systems for Improved Protection, Security and Reduced Maintenance Costs of Pipelines
Jamal Rostami and H. Besharatian

Session 3A: Geographic Information Systems
Rick Nelson, P.E., Black & Veatch Corporation

3A-1. Use of Pipeline for Site Selection of Sediment Deposits by GIS
Tiao J. Chang and Vito A. Cimino

3A-2. Utilizing GIS in Developing Realistic Demand Distributions to Support Modeling in Water Supply Master Planning
Art K. Umble, Melissa Moran, Tarlochan Bhullar and Michael C. Machlan

3A-3. Building a Pipeline GIS for Integrity Management, HCA Determination, and Incident Planning
Brent A. Jones

3A-4. Role of GIS in Pipeline Industry
Vijay Yelakanti, Mohammad Najafi and Ahmad Habibian

Session 3B: Condition Assessment for Water Lines II
Randy Robertson, Cyntech Corporation

3B-1. Prestressed Concrete Cylinder Pipeline Evaluation: A Toolbox Approach
Richard A. Lewis and Matt Wheatley

3B-2. Innovative Approach to make a Condition Assessment Using Hydraulic Models
É. Lalonde and B. Prince

3B-3. Hydrostatic Pressure Testing of Prestressed Concrete Cylinder Pipe with Broken Wires
Mehdi S. Zarghamee

3B-4P. Pressure – Leakage Relation in Urban Water Distribution Systems

Reza Ardakanian and Ali Akbar Ghazali

Session 3C: Corrosion II

George Ruchti, American Spiral Weld Company

3C-1. Cathodic Protection for the Surface Water Transmission Program

Rafael Ortega, Gregory Lentz, Christine Kirby and Arthur Morris

3C-2. Break Reduction/Life Extension Program for Cast and Ductile Iron Water Mains

George A. Gehring Jr., Dale Lindemuth and Walter T. Young

3C-3. Cathodic Protection Applications for Water System Piping

James T. Lary

Session 3D: Pipeline Renewal Panel Discussion

Jim Scott, Solution Resource

3D-1. Pipeline System Renewal Technologies

B. Jay Schrock

3D-2. Centrifuge Modelling of Soil Load Transfer to Flexible Sewer Liners

John Gumbel, Aleksandar Spasojevic, and Robert Mair

3D-3. “Fully Deteriorated” Design in Rigid Pipe Rehabilitation with Flexible Liners

George McAlpine

Session 3E: Pipeline Security and Safety II

Dr. Henry Liu, P.E., Freight Pipeline Company

3E-1. Protecting from Third Party Damage

Will Worthington and Brian Mergelas

3E-2. Economic Impact Analysis to Optimize Investments in Damage Prevention for Pipeline Construction

Leonhard E. Bernold

3E-3. High Resolution Defect Detection for Thermoplastic Butt-Welds in Operating Pipelines by Ultrasonic TOFD

Barry Messer, Matthew Yarmuch and Peter den Boer

- 3E-4. Technology for the Tele-Robotic Laying of Large and Small Pipes**
Leonhard E. Bernold and Bin Li

Session 4A: Hydraulic Modeling

Dr. Tom Walski, P.E., Haestad Methods

- 4A-1. Pressure Transient Control Strategies for Water Pipeline Systems**
Kevin T. Laptos, Michael T. Brown, and Jamie R. Shambaugh
- 4A-2. The Marriage of Modeling and GIS**
Thomas M. Walski
- 4A-3. Hazen-Williams Coefficient – The Pipeline “C” Factor**
Thomas K. Bean, Michael E. Canning and Larry V. Rott
- 4A-4. Simulation for Interactions between Storm Sewer and Overland Flows**
Shiuan-Hung Chen, Ming-Hsi Hsu and Tzen-Show Chen

Session 4B: Condition Assessment

Frank Donaldson, Patton Rust Harris and Associates

- 4B-1. Evaluation, Rehabilitation, and Replacement of the 50-Year-Old Upper Jones Falls Interceptor**
Graeme C. Lake, Craig A. Benson, Gary A. Wyatt and Wazir Qadri
- 4B-2. Shopping for a Sag-free Sewer: Design of a Deep Sewer Line Replacement at a Major Regional Shopping Mall**
Janice Ruhl, Bruce Pierstorff and Sam Shaikh
- 4B-3. Fuzzy Approach for Pipe Condition Assessment**
J. M. Yan and K. Vairavamoorthy
- 4B-4. Computerized Sewer Pipe Condition Assessment**
Myung Jin (Andy) Chae, Tom Iseley and Dulcy M. Abraham

Session 4C: Corrosion III

Jeff Moncrief, CDM

- 4C-1. Minimizing Infrastructure Corrosion**
Scott Paul
- 4C-2. Experimental Investigations of the Effect of Selected Admixtures on the Resistance of Concrete to Sulfuric Acid Attack**
E. Hewayde, E.N. Allouche and G.F. Nakhla

4C-3. Corrosiveness of Controlled Low Strength Materials vs. That of Encasement Sand

Ahmad Samadi and Richard Herbert

4C-4. Research on the Corrosion of Sewer System Pipelines from Domestic Wastewater

Chen Zhaohui, He Qiang and Yan Wentao

Session 4D: Sewer Lines Renewal II

John J. Struzziery, P.E., S E A Consultants Inc.

4D-1. An Opinionated Review of Trenchless Technologies for Pipeline Rehabilitation

Henry R. (Kelly) Derr

4D-2. The Road to Rehabilitation of a 42-Inch Diameter Interceptor

John Trypus, William Darrow and John Mattingly

4D-3. Planning, Design, and Implementation of Large Diameter Sewer Rehabilitation

Paul V. Savard, Eleanor Duffy, David K. Pottle and John E. Murphy

4D-4. Automated Assessment Technologies for Sanitary Sewer Evaluation

Sanjiv Gokhale and Makarand Hastak

4D-5P. A New Device for the Control Compaction of Trench Backfills for Buried Flexible Pipes

Olivier Thépot

4D-6P. Pipe Rehabilitation and Utility Conflicts in Urban Environments

Aaron K. Nelson Gary Wyatt and Wazir Qadri

Session 4E: Risk Assessment & Management

Ken Kienow, P.E., Kienow Associates, Inc.

4E-1. Risk Management in Underground Infrastructure Construction and Rehabilitation

Tom Sangster

4E-2. Risk Analysis of Prestressed Concrete Cylinder Pipe with Broken Wires

Mehdi S. Zarghamee, Daniel W. Eggers, Rasko Ojdrovic and Brian Rose

4E-3. Risks Analysis for Prioritizing Urban Sewer Rehabilitation: A Decision Support System

Youssef George Diab and Denis Morand

4E-4. Risk Assessment of Gray Cast Iron Pipelines

Hidetaka Minagata, Koji Yoshizaki and Yoshito Hatsuda

Session 5A: Pipeline Design I

Grant Whittle, Ultraliner

- 5A-1. 72-Inch Parallel Transmission Main Needs to Know for Design and Construction**
Frank Eskridge, Mike Sharpless and Pat Rogers
- 5A-2. Project Management – Pipeline Hydraulic Analysis Design and Construction of 9,599-m (31,492-LF) of 137-cm (54-in.)/122-cm (48-in.) Finished Water Transmission Main, Henrico County, Virginia**
Daniel Seli, Ralph Claytor and Larry Sivak
- 5A-3. Performance of Shallow Cover Method with Geogrid at Large Blasting Test**
Satoshi SUENAGA, Yoshiyuki MOHRI, Kennichi MATSUSHIMA
- 5A-4. Three-Dimensional Response of Buried Pipe Under Vehicle Loads**
Munaz A. Noor and Ashutosh S. Dhar

Session 5B: Condition Assessment for Sewer Lines II

Alison Ratliff, HDR Engineering, Inc.

- 5B-1. Prioritizing Sanitary Sewer Rehabilitation with CCTV Inspection/Automated Rating/Ranking System**
Roy D. Holmberg and Kipp Nelson
- 5B-2. Sewer Condition Assessment and Rehabilitation: A Fast-Tracked Approach to a Small Community's Problem**
John Correa, Satish Kamath and Sylvester Hsu
- 5B-3. RFEC/TC Technology Advancement Through GMRA Experience**
Brian Mergelas, Stat Shatat, Xiangjie Kong, Weihua Mao and David L. Atherton
- 5B-4. Condition Assessment of Sewers for Replacement/Rehabilitation and the Accompanying Development of a Management System**
Johann W. Wessels

Session 5C: Fiber Optics in Utilities

Dr. Jey K. Jeyapalan, P.E., Consultant

- 5C-1. Municipal Optical Fiber Through Existing Sewers, Storm Drains, Drinking Waterlines, and Gas Pipes May Complete the Last Mile**
Jey K. Jeyapalan
- 5C-2. Third-Party Pipeline Integrity Program/Construction Management**

Christopher A. Pioli and Mark P. Smith

5C-3. CIPP Process: Installation of Fiber Optic Cables in Sewers

Gregory K. Anderson

5C-4. Contractors' Concept of Optical Fiber in Sewers or Abandoned Pipelines

Michael C. Welch

Session 5D: Water Lines Renewal I

Timothy M. Stinson, P.E., S E A Consultants Inc.

5D-1. Structural Repair of a 42-in. (1,067 mm) Steel Water Main

Irene McSweeney Woodfall

5D-2. No Two Conduits Are Alike: The Challenges and Lessons Learned During the Rehabilitation of the Washington Aqueduct's Raw Water Conduits

Nathan H. A. Cole and Thomas P. Jacobus

5D-3. External Corrosion of Water Piping Systems – Causes and Solutions

James Lary and David H. Kroon

5D-4. Rehabilitation Management of Pre-Stressed Concrete Cylinder Pipe Using Remote Field Current /Transformer Coupling (RFEC/TC) and Other Technologies

A. Almugerhiy Abdullah, M. Elaish Reafat and M. Enawaa Khalifa

Session 6A: NSF Panel Discussion on "Pipeline Interdependencies, Security, and Asset Management"

Dr. Miriam Heller, National Science Foundation

6A-1. Infrastructure Security, Dependencies, and Asset Management

Miriam Heller

6A-2. Underground Infrastructure and Interdependencies: WTC Case Study

Tom O'Rourke (Presentation only)

6A-3. Service Implications of Managing Infrastructure Distribution Systems in Crises

Rae Zimmerman

6A-4. Water Infrastructure Security: Performance Metrics

Neil S. Grigg

6A-5. Sewer Asset Management Decisions, Rehabilitation, and Security

Dulcy Abraham

Session 6B: NASSCO/WRc/PAC Pipeline Materials & Deterioration Assessment Program

Robert Carpenter, *Underground Construction Magazine*

6B-1. Pipeline Assessment and Certification Program (PACP)

Irvin Gemora

6B-2. Implementation of the Pipeline Assessment and Certification Program

Rod Thornhill

6B-3. Evaluation of Collection Systems using the Aqua Zoom Camera

Stephane Joseph and William Di Tullio

6B-4. Future Outlook For Pipeline Materials, Methods, And Maintenance

Jey K. Jeyapalan

Session 6C: Operation & Maintenance

Philip M. Hannan, P.E., Black & Veatch Corporation

6C-1. An Innovative Method for Cleaning Large Bore Sewer

M.A. (Rusty) Nezat, II

6C-2. Who You Gonna Call? Emergency Response Planning for Sanitary Sewer Overflows in Baltimore, Maryland

Robert Tuttle, Warren Williams, Jay Sakai and Robert Mohr

6C-3. Wireless SCADA Demonstration – Project History

Hiram Tanner

6C-4. Case Study of Hydraulic Transients Generated by Microfiltration Processes

R. Scott Foster

Session 6D: Water & Sewer Lines Renewal

Joseph P. Castronovo, P.E., CH2M HILL

6D-1. So You Thought Water Main Repairs Were Straightforward?

Joseph Kavanagh, Warren Williams and Jaswant Dhupar

6D-2. Carbon FRP Strengthening of PCCP Aqueducts

Tarek Alkhrdaji and Jay Thomas

6D-3. 84-inch Aerial Water Main over US 59: Limiting Collateral Damage by a Rupture

Emmanuel De Pau and Charles Troy Anthony

6D-4. Renewal of Fully Deteriorated Sewers - The Importance of Engineering Due Diligence

Randy Cooper

Session 7A: Pipeline Research

Dr. Ahmad Habibian, P.E., Black & Veatch Corporation

7A-1. Past, Present, and Future – An Overview of AwwaRF Pipeline-Related Infrastructure Reliability Research

Jian Zhang

7A-2. Pipeline Systems R&D for Critical Infrastructure Protection

William E. Kirksey

7A-3. Overview of WERF's Collection System Related Research Activities

Amit Pramanik, Linda Blankenship and Jeff C. Moeller

Session 7B: Pipeline Installations

Steven Kramer, P.E., Jacobs Civil

7B-1. Equipment Mounted Multi-Sensory System to Locate Pipes

Leonhard E. Bernold, Lashminarayan Venkatesan and Sushil Suvarna

7B-2. Productivity Analysis of Auger Boring Trenchless Pipe Installation Using Simulation

O. Salem, N. Galani, and M. Najafi

7B-3. Trenchless Pipe Replacement with Rigid Pipe Using the Tenbusch Insertion Method™

Al Tenbusch and Albert F. Tenbusch

Session 7C: Pipeline Grouting

Dick Krzys, *Trenchless Technology Magazine*

7C-1. Analysis and Performance of PCCP Mortar Coating

Mauro Scali, Paul Scheiner, Wilkins Aquino, Rasko Ojdrovic and Mehdi Zarghamee

7C-2. CIGMAT Testing Programs for Coatings/Linings, Grouts and Pipe -Joints in Sewers

C. Vipulanandan and J. Liu

7C-3. Injecting Cement Grout During Horizontal Directional Drilling (HDD) Pullback

Richard M. Stauber, Timothy A. Frame, Matthew Kedzierski

Session 7D: Water Lines Renewal II

William E. Shook, AP/M PERMAFORM

7D-1. Prioritizing Water Main Renewal Program

Arun K. Deb, Jerry K. Snyder, G.V. Loganathan, N. Agbenowski and Frank Grablutz

7D-2. Water Main Rehabilitation Using Rapid-Setting Polymeric Lining Material – Sandwich, Massachusetts

Douglas B. Gove, Jr., Peter Oram and Daniel H. Mahoney, Jr.

7D-3. Future of America's Water is in Our Hands

Jey K. Jeyapalan

Session 8A: Pipeline Design II

Lynn Osborn, Insituform Technologies

8A-1. Designing a 72-inch Water Line on an Accelerated Schedule

Alisa Gruber, Rafael Ortega, and Arthur Morris

8A-2. Design of Reinforced Concrete Cylinder Pipe for The Pima-Maricopa Irrigation Project

Henry H. Bardakjian

8A-3. Surge Pressure Allowance for Thrust Restraint Design of Small Diameter Water Distribution Main

David C. Shen

8A-4. The Design of Non-Circular Linings

Olivier Thépot

8A-5P. Interactive Simulation-Based Educational Software for Management of Municipal Sewer Networks

Erez N. Allouche and L. Sammy Wong

Session 8B: Geotechnical Considerations I

Henry Nodarse, P.E., Bernardin, Lochmueller & Associates, Inc.

8B-1. Construction Methods for the Installation of Transmission Pipelines in Western China

Meng Li

8B-2. Suggested Bedding Factors of Controlled Low-Strength Material for Concrete Pipe

Gerrit L. Slatter

8B-3. Development of Soil-Structure Interaction Solution for Buried Pipe Design

Ashutosh S. Dhar

8B-4. Safety Assessment of Gas Pipelines Under The Jamuna Bridge Access Road Rehabilitation

Ashutosh S. Dhar, Munaz A. Noor, Tahsin R. Hossain, Salek M. Seraj,
Md. S. Hoque and Abdul J. Khan

8B-5P. Impact of Deep Excavations on Adjacent Buried Pipelines

Dayong Li, Ming Xiao and Qingjun Zeng

Session 8C: Seismic Effects on Pipelines

Dr. Mehdi S. Zarghamee, P.E., Simpson Gumpertz & Heger Inc.

8C-1. Experimental Study on Soil-Pipeline Interaction Using EPS Backfill

Koji Yoshizaki and Takashi Sakanoue

8C-2. Some Parameters for Seismic Design and Analysis of Buried Pipelines

Han Yang, Sun Shaoping and Cui Yuping

**8C-3. Seismic Vulnerability Function for High-Diameter Buried Pipelines:
Mexico City's Primary Water System Case**

Omar Pineda-Porras and Mario Ordaz-Schroeder

Session 8D: Pipe Bursting/Jacking

Dr. Sanjiv Gokhale, P.E., Vanderbilt University

**8D-1. The Selection of Tunneling Method and the Eventual Use of Pipe Jacking
Techniques for the Installation of a Power Station Tailrace Tunnel in Machu
Picchu Peru**

David G. Abbott

8D-2. Ingredients for Successfully Installing Pipe Using Trenchless Methods

Tennyson M. Muindi and Daniel J. Dobbels

8D-3. Predicting Ground Displacements Caused by Pipe Splitting Operations

David N. Chapman, Andrew H. C. Chan, Christopher D. F. Rogers,
Frederick S. K. Wan and Paul C. F. Ng

8D-4. Parameters for Designing Static Pipe Bursting Operations

Ulf-Hilmar Hahn and Samuel T. Ariaratnam

8D-5P. Research on a Hydraulic Impact Hammer System for Pipe-Ramming

Kun Yin, Jianming Peng, Qingyan Wang and Rusheng Wang

Session 9A: Pipeline Analysis

Dr. Ossama Salem, University of Cincinnati

9A-1. Analysis of Blast Effects on PCCP Pipelines

Rasko P. Ojdrovic, Brian D. Rose, and Mehdi S. Zarghamee

9A-2. Analysis of Pipeline Relocations

Gerald Donnelly, Christopher Antoni, Walter H. Skorupsky and William Serra

9A-3. D.E.M. Analysis on Behavior of Shallowly Buried Pipe Subject to Traffic Loads

Kawabata,T., Uchida,K., Ariyoshi,M., Nakase,H., Mohri,Y. and Ling,H.I.

9A-4. Numerical Evaluation of Load Capacity of Corroded Pipes

Joabson Lima Alves and Deane Roehl

Session 9B: Geotechnical Considerations II

Tom Richardson, P.E., URS

9B-1. Geotechnical Investigations for Trenchless Technology

Tom Richardson, Mohamed Younis and Paul Headland

9B-2. Microtunneling Challenge in Las Vegas

Bijan Khamanian and Richard Capp

9B-3. Geotechnical Risk Assessment: Estimating Slope Failure Probability

Gerry Ferris, Alan Samchek and Andy Isherwood

9B-4. TBM vs. MTBM: Geotechnical Considerations

David C. Mathy and Robert A. Kahl

9B-5P. Experiments on Buried Pipe Using Backfill of Cover with Geosynthetics

Kawabata,T., Uchida,K., Hirai,T., Mohri,Y., Ling, H.I. and Koyama,N

9B-6P. Design of Buried Pipes Considering the Reciprocal Soil-Structure Interaction

Nelly Rubio, Deane Roehl and Celso Romanel

Session 9C: Pipeline Materials

Mark Bruce, Can Clay Corporation

9C-1. Thermoplastic Pipe Deep-Burial Project In Ohio: Initial Findings

Shad M. Sargand, Teruhisa Masada and Doug Gruver

9C-2. Coefficient of Thermal Expansion Characterization for Plain Polyethylene Pipe

Hanakumbo Mwanang'onze, Ian D. Moore and Mark Green

9C-3. The Versatility of Ductile Iron Pipe in Trenchless Construction

Ralph Carpenter and Randall C. Conner

9C-4. QA/QC for Close-Fit Trenchless Pipeline Renewal

Ed Kampbell and L. Grant Whittle

Session 9D: Horizontal Directional Drilling I

John D. Hair, P.E., J. D. Hair & Associates, Inc.

9D-1. Predicting and Controlling Hydraulic Fracturing During Horizontal Directional Drilling

Samuel T. Ariaratnam, Richard M. Stauber, Jason Bell, Bruce Harbin, and Frank Canon

9D-2. Analysis of Theoretical Versus Actual HDD Pulling Loads

Jeffrey S. Puckett

9D-3. Impact of Tortuosity in Drilling and Reaming of Long HDD Holes in Hard Rock

Andrew Lukas

9D-4. Development of KCM130 Steerable Air-Powered Impact Mole for Directional Boring

Jianming Peng, Kun Yin, Maosen Wang, Huiwen Xu and Jijun Su

Session 10A: Pipeline Design III

William F. Quinn, P.E., F.ASCE, PLD Advisory Committee

10A-1. Case Study: Using Trenchless Technologies With Conventional Methods To Construct A Sanitary Sewer Rehabilitation Improvements Project

Joseph P. Castronovo and David Abbaspour

10A-2. Challenges of Relocating a Wastewater Effluent Outfall on the Potomac River

Cynthia C. Brush, John R. Kovacs and Gregory V. Kemp

10A-3. Anyone Can Put in a Pipe! Construction of the Fresh Pond Parkway Sewer Separation and Surface Enhancements

Owen O'Riordan, Vincent W. Spada

10A-4. Subaqueous Pipeline Design, Installation & Material Selection

Dane R. Hancock

Session 10B: Subsurface Utility Engineering

James H. Anspach, P.G., So-deep, Inc.

10B-1. Pipeline Planning Utilizing C/I ASCE 38-02

Philip K. Ryan and James H. Anspach

10B-2. Pipeline Relocation Design Utilizing C/I ASCE 38-02

Frank W. Huber, James H. Anspach and Robin C. Persad

10B-3. Subsurface Utility Engineering - A Technology-Driven Process that Results in Increased Safety, Fewer Claims, and Lower Costs

Nicholas M. Zembillas

10B-4. Pipeline Damage Prevention Systems

Hyung Seok Jeong, Dulcy M. Abraham, Jeffrey J. Lew

Session 10C: Emerging Technologies

Dr. Mohammad Najafi, P.E., Michigan State University

10C-1. A Simplified Approach for Selecting a Trenchless Construction Method for Municipal Sewers

Erez N. Allouche and Alireza Parhami

10C-2. A New Qualification Concept for Sewer and Pipeline Construction Based on an Innovative, Network-Based Solution for Virtual Teaching, Learning and Working

Robert D. Stein

10C-3. Document Management: Internet Based Solutions

Ned Baghdassarian

10C-4. Application of Inventing Problem-Solving Theory (TRIZ) In Pipeline Technologies

Roustem Kourmaev and Abram Teplitskiy

Session 10D: Horizontal Directional Drilling II

Vince Rybel, P.E., CH2M Hill

10D-1. Water and Sewer Construction with Horizontal Directional Drilling Equipment

Gary Lawson

10D-2. Analysis of Heave and Subsidence Risk for Horizontal Directional Drilling

Mathew Francis, James Kwong, and Kristi Kawamura

10D-3. Kick in the Tail Saves HDD Shore Approaches

Hugh W. O'Donnell and Eric R. Skonberg

10D-4. Using Ductile Iron Pipe for Horizontal Directional Drilling Installations

Richard W. (Dick) Rowell

Session 11A: Pipeline Planning

William F. Quinn, P.E., F.ASCE, PLD Advisory Committee

11A-1. Community Relations Program Helps Neighborhood Survive Major Construction

Judith A. Kavanagh

11A-2. Navigating a Large Diameter Water Main Through an Oil Field

Rafael Ortega, P.E., Gregory Lentz, P.E. and Arthur Morris

11A-3. An Innovative Solution Resolves Political, Inter-Governmental and Technical Constraints

David J. Rigby, Gilbert Osei-Kwadwo and Thomas J. McFadden

11A-4. Evaluation and Planning of Trenchless Sewer Alternatives in Venezuela

Joseph A. Strauch

11A-5P. Planning, Design and Construction of Wastewater Flow Relief Facilities

Steven R. Henning

11A-6P. Pipeline Planning and Development

James O. Ekhaton, A. O. Ayanta, A. O. Ehigiator, Edwin O. Igiede, Anthony O. Ekhaton and Brawnson O. Edionwe

Session 11B: Investigation Innovations

James Thomson, Jason Consultants

11B-1. New and Effective Technology for Condition Assessment of Ferrous Pipelines and Other Ferrous Structures

Martin Roubal

11B-2. Innovative Inspection Methodologies for Wastewater Systems

Robert S. Morrison and James C. Thomson

11B-3. A Three Level Strategic Approach to Investigating and Evaluating Wastewater Networks

Alan McCloskey

11B-4. State-of-the-Art in Sensor Technologies for Pipe Inspection

Sunil K. Sinha

Session 11C: Freight Pipelines

Dr. Henry Liu, P.E., Freight Pipeline Company

11C-1. Freight Pipelines: An Overview

Henry Liu

11C-2. Applicability of Pneumatic Capsule Pipeline to Radioactive Waste Disposal Facility

Sanai Kosugi, Takeshi Fukunaga, Nobuyuki Matsui, Kazuo Saito, Koji Hane and Kazuo Okutsu

11C-3. CargoCap – Transportation of Goods through Underground Pipelines: Research Project in Germany

Dietrich Stein and Britta Schoesser

11C-4. Linear Electric Motors for Pneumatic Capsule Pipeline Propulsion

Robert M.O'Connell

Session 11D: Microtunneling & Tunneling I

David G. Abbott, C.Eng., Jason Consultants International, Inc.

11D-1. The use of Microtunneling Techniques for Sewer Installation in a Challenging Caribbean Environment

Peter G. Galbraith

11D-2. Large Diameter Pipe Design Under Urban Constraints

Jennifer McNutt, Mike Middleton, Dave Bennett, Bruce Corwin and Brett Grant

11D-3. Construction Management Considerations and Techniques Used to Microtunnel a New Sewer Main Under Pacific Coast Highway for the City of Santa Monica

F.J. Schroeder, Susan Lowell, Ralph T. Eberts, Monte L. Wilson and Chuck R. Parker

11D-4. Microtunneling Beneath Historic Alexandria, Virginia

Robert H. Zeiller, Thomas Meinhart, William E. Rice and Andy J. Robinson

Session 12A: Physical Modeling

Joanne Hughes, Raven Lining Systems

12A-1. Physical Modeling of Frost Jacking

D. J. Goodings and N. A. Straub

12A-2. Accelerated Creep Testing of Trenchless Liners

Ever J. Barbero and Kevin J. Ford

12A-3. Unexpected Patterns of Seepage from Underground Contaminant Leakage into Freezing Soil

S. J. Han, D. J. Goodings, A. Torrents and M. Zeinali

12A-4. Quantitative Analysis and Comparison of Traffic Disruption Using Open-Cut and Trenchless Methods of Pipe Installation

Bhavani S. Gangavarapu, Mohammad Najafi and Ossama Salem

Session 12B: CMOM Panel Discussion

Cliff Cate, P.E., Wade & Associates, Inc.

12B-1. CMOM Panel Discussion Introduction

Mark Wade

12B-2. CMOM and EPA (Abstract only)

Kevin DeBell

12B-3. CMOM in Fairfax County, Virginia (Abstract only)

Ifty Khan

12B-4. CMOM and Legal Implications (Abstract only)

Paul Calamita

12B-5P. How Government Regulations are Driving Pipe Renewal Efforts

L. Grant Whittle

12B-6P. Summary of Water Infrastructure Legislations (Abstract only)

Jill Raynor

Session 12C: Pipeline Crossings

Henry Nodarse, P.E., Bernardin, Lochmueller & Associates, Inc.

12C-1. The Abram Creek Culvert – How Burying One Mile of Stream Allowed Cleveland’s Airport to Expand

John Aldrich

12C-2. Design and Construction of Major River Crossings in Pakistan

Shaukat Qadeer,

12C-3. Guided Boring Method – Case Study

Terry Fisher, Akkerman Inc.

12C-4. Development of ASCE Manual of Practice for Auger Boring Projects

Guru Kulandaivel, Mohammad Najafi and Sanjiv Gokhale

Session 12D: Microtunneling & Tunneling II

Dr. Alan Atalah, P.E., Bowling Green State University

12D-1. Development of Design Options for the Installation of 10 KM of Sewer in Very Soft Lacustrian Clays

James Thomson and David G. Abbott

12D-2. Houston's Hidden Tunnels; Trials and Tribulations of Large Diameter Tunnels

Rafael Ortega, Gregory J. Henry, and Hamlet Hovsepain

12D-3. New Intake Tunnel Delivers Cooling Water to the Pentagon

Steven R. Kramer, Jerry Nystrom, John Woodson and Brian T. Dziekonski

12D-4. Design and Construction of Large Diameter Pipelines in a Shaft and Tunnel System – Hong Kong Experience

Alan H.L. Man and K.Y. Mak