

NOW ENTERING ITS 17<sup>TH</sup> YEAR

# PIPELINE PIGGING & INTEGRITY MANAGEMENT

COURSES • CONFERENCE • EXHIBITION

FEBRUARY 7-10, 2005 • HOUSTON • WYNDHAM GREENSPOINT HOTEL

The international forum for  
best practices in lifetime maintenance  
and inspection technology  
for natural gas, crude oil, and products pipelines.

#### TRAINING COURSES • FEBRUARY 7-8, 2005

Pipeline Pigging Technology  
Defect Assessment in Pipelines  
Pipeline Repair Methods/InService Welding Course  
Direct Assessment Course

#### CONFERENCE • FEBRUARY 9-10, 2005

The industry's only forum devoted exclusively to pigging  
for maintenance and inspection, as well as pipeline  
integrity evaluation and repair

#### EXHIBITION • FEBRUARY 8-10, 2005

Visit one-on-one with the leading technology suppliers  
in this fast-evolving field



# Pre-Conference Technical Courses

## February 7-8, 2005

For the full list of topics covered in these courses, visit [www.clarion.org](http://www.clarion.org)

### COURSE 1 PIPELINE PIGGING AND IN-LINE INSPECTION

The use of in-line tools for inspection and cleaning is accepted as essential for the safe and profitable operation of all pipelines. Government regulations now require internal inspections with MFL or ultrasonic "smart" pigs, while a broad range of "conventional" pigging tools are now used to clean, measure, seal, or dry pipelines during maintenance or commissioning operations. The Pipeline Pigging Course is designed to provide a comprehensive introduction to all aspects of utility and in-line inspection pigging. Led by four of the most experienced, independent experts in this field today, the course will be conducted as a workshop, and attendees will be actively encouraged to participate.

#### WHO SHOULD ATTEND:

The course is especially designed for project managers, engineers, maintenance and technical personnel responsible for pipeline integrity assurance, flow assurance, corrosion control, and safety.

#### LECTURERS:

Joseph Caldwell, President, Caldwell & Associates.  
Gary Smith, President, Inline Services.  
Dr. Martin Phillips, Senior Engineer, CC Technologies Services  
George Williamson, Manager of DOT Regulatory Compliance for BP.

**Topics covered:** Pipeline safety and regulations. Utility and maintenance pigging. Metal loss in-line inspection. Other in-line inspection tools. Crack detection pigs. Mapping. Geometry and bend-detection pigs. Wax deposition measurement. Spanning pigs. Semi-intelligent pigs. Designing and implementing an in-line inspection (ILI) program. Post in-line inspection issues.

### COURSE 3 PIPELINE REPAIR METHODS/INSERVICE WELDING

This course will cover the various aspects of pipeline repair using weld and non-weld methods, as well as the concerns for welding onto in-service pipelines and the approaches used to address them.

#### WHO SHOULD ATTEND

Pipeline engineers, Operations and Maintenance personnel, inspectors, and welders.

#### LECTURERS

William A. Bruce, Principal Engineer, Edison Welding Institute.  
Dr. Martin Phillips, Senior Engineer, CC Technologies Services  
Chris Alexander, Staff Consultant, Stress Engineering Services.

**Course topics:** Defect assessment prior to repair. Selecting an appropriate repair method. Burnthrough and related safety concerns. Hydrogen cracking concerns. Full-encirclement repair sleeves. Hot tap branch connections. Pipeline repair by weld deposition. Nonwelded repairs. Code and regulatory requirements. Procedure selection for hot tap and repair sleeve welding. Practical aspects of hot tap and repair sleeve welding. Lessons learned.

### COURSE 2 DEFECT ASSESSMENT IN PIPELINES

The increasing use of inline inspection methods is helping pipeline owners to assess the condition of their lines, and if these methods are combined with modern defect-assessment methods, they can provide a very powerful, and cost-effective, tool. This course will present the latest defect-assessment methods, which range from simple, quick, assessment methods, to more-detailed fitness for purpose analysis. It will cover assessment of internal and external corrosion, dents and gouges, cracks (e.g. SCC), weld defects, and fatigue. The course is highly interactive and takes the form of lectures, workshops, and case studies.

#### WHO SHOULD ATTEND

Pipeline engineers, designers and service professionals who are involved with the maintenance, inspection, and repair of pipelines.

#### LECTURERS

Professor Phil Hopkins, Technical Director, Penspen Integrity.  
Dr. Andrew Cosham, Pipeline Integrity Consultant, Penspen Integrity.

**Topics covered:** Defect failure relationships. Corrosion defects. Workshop: corrosion assessment using fitness for purpose. Gouges. Dents. Cracks. Weld defects. Setting intelligent pig inspection levels. Pipeline repair and rehabilitation. Risk and integrity management and analysis. Workshop: setting priorities.

### COURSE 4 DIRECT ASSESSMENT METHODS FOR PIPELINE INTEGRITY

On completion of the course, participants will have a solid understanding of the procedures, strengths, limitations, and applicability of various Direct Assessment technologies and methods as they relate to pipeline inspection and integrity assessment for compliance with DOT regulations, and of the related industry codes and standards which will be reviewed and explained.

#### WHO SHOULD ATTEND:

Pipeline engineers, designers and service professionals who are involved with the maintenance, inspection, and repair of pipelines.

#### LECTURER:

Kurt Lawson, Vice President, CC Technologies Services.

**Course topics:** Regulatory issues. NACE Standard. INGAA. ASME B31.8S. External Corrosion Direct Assessment (ECDA). NACE Standard RP0502-2002. Internal Corrosion Direct Assessment (ICDA). Stress Corrosion Direct Assessment (SCCDA).

All courses are two full days, from 8am to 5pm each day. Lunch and refreshments are included. Participants will receive an extensive and detailed set of the lecture notes for long-term reference after the course. Upon completion, each course participant will be eligible to receive 1.2 Continuing Education Units (CEUs).

# PIPELINE PIGGING and INTEGRITY MANAGEMENT CONFERENCE

February 9-10, 2005 • Provisional Program

Note: this program is subject to change

WEDNESDAY, FEBRUARY 9, 2005

8.30

## OPENING ADDRESS

GEORGE TENLEY  
PRESIDENT, PRCI

9.00

## REGULATIONS DRIVING IN-LINE INSPECTION TECHNOLOGY DEVELOPMENT

LARRY PAYNE AND CHUCK HARRIS,  
TD WILLIAMSON  
MIKE STACKHOUSE, KOCH PIPELINE

OPS regulations require that dent anomalies be investigated and repaired under certain conditions. With the introduction of new Deformation Tools, pipeline operators now have a dent-detection technology that provides better definition of anomalies, which helps avoid costly digs and repairs. Metal loss technology has also become greatly improved with use on "hall effect" sensors, the increase in sensors, and the increase in data storage and processing capability. This paper will introduce some of the new and improved technologies available.

9.40

## CASE STUDY: LESSONS LEARNED DURING THE IN-LINE INSPECTION OF A PIPELINE CONTAINING BELL-AND-SPIGOT JOINTS, CHILL RINGS, AND MITER BENDS

FRANK A DAUBY, JR,  
PGE, WALNUT CREEK, CA, USA,  
ERIC C QUICK,  
TUBOSCOPE PIPELINE SERVICES,  
HOUSTON, TX, USA

This case study will discuss the methods used and lessons learned by PGE throughout a two-

year effort to successfully traverse a 25-mile 24" California pipeline with an in-line inspection tool. Along with 1.5-D radius forged elbows, this pipeline contains many appurtenances such as miter bends, chill rings, and bell-and-spigot joints that render the in-line inspection of this line challenging.

10.20 Coffee

10.45

## PIGGING QUIZ - WHAT DO YOU REALLY KNOW?

AL CROUCH,  
SOUTHWEST RESEARCH INSTITUTE,  
SAN ANTONIO, TX, USA  
PAT PORTER,  
CLOCK SPRING, TX, HOUSTON, USA

11.15

## ROBOTIC INSPECTION SYSTEM FOR UNPIGGABLE PIPELINES

ROBERT TORBIN AND WILLIAM LEARY,  
FOSTER-MILLER, INC.,  
WALTHAM, MA, USA,  
GEORGE VRADIS, NORTHEAST GAS  
ASSOCIATION, NEW YORK, NY, USA

The inspection of unpiggable pipelines requires the marriage of a highly-agile robotic platform with NDE sensor technology operating as an autonomous system. Foster-Miller and PII are developing a robot that is essentially a battery-powered, train-like, platform. Like a train, the platform includes additional 'cars' to carry the required payloads, including NDE sensor module(s), power supply, and data acquisition/storage components. The onboard distributed intelligence gives the

platform the capability of an engineer steering the train through the complex pipe geometry. The robot is designed with a slender aspect ratio and the ability to change shape as required by the physical obstacle presenting itself.

11.55

## PIG TRACKING THROUGH THE INTERNET: A NEW USE FOR EXISTING TECHNOLOGY IN PIPELINE PIGGING

SHAMUS MCDONNELL AND GREG ZINTER,  
HUNTER MCDONNELL PIPELINE  
SERVICES INC.,  
EDMONTON, AB, CANADA

While many operational and technical innovations have been developed to assist with the tracking and locating of pigs, there has not been any advance in communications of the pig tracking information to the pipeline operators; until now. This paper discusses the development and field trials of a system to post and view pig tracking information through the internet.

12.30 Lunch



1.30

### SMART PIG DEFECT TOLERANCES: QUANTIFYING THE BENEFITS OF STANDARD AND HIGH-RESOLUTION PIGS

STEPHEN WESTWOOD,  
BJ PIPELINE INSPECTION SERVICES,  
CALGARY, AB, CANADA,  
DR PHIL HOPKINS,  
PENSPEN INTEGRITY, NEWCASTLE, UK

This paper describes how defect sizing tolerances and confidence levels are obtained by pigging companies, and compares standard and high-resolution pigs. Probability theory is used by the authors to estimate the likelihood that a defect is smaller or deeper than the reported (by the pig) value for both standard and high-resolution tools. The paper also shows how these tolerances can be included in defect failure assessment and the results of multiple pig runs.

2.10

### PIPELINE INTEGRITY ANALYSIS - TOOL VALIDATION

PERRY BARHAM,  
BP PIPELINES NA, LISLE, IL, USA,  
BRYCE BROWN,  
ROSEN USA, HOUSTON, TX, USA  
MARTIN FINGERHUT,  
RTD QUALITY SERVICES, HOUSTON, TX,  
USA

This paper presents an overview of the validation process undertaken by BP on a 32-mile section of 18-in pipe. Field measurement and data validation included the use of a high-resolution laser-mapping system to acquire true measurements to overlay and compare to the ILI inspection data. Defect classification and distribution is examined, and methods of selecting validation locations for future inspection developed.

2.50

### ILI TOOL VALIDATION: FEATURE ASSESSMENT AND MAPPING

AL CROUCH, SOUTHWEST RESEARCH INSTITUTE, SAN ANTONIO, TX, USA,  
PATRICK PORTER, CLOCK SPRING (PRESENTER), HOUSTON, TX, USA,  
TODD GOYEN, SOUTHWEST RESEARCH INSTITUTE, SAN ANTONIO, TX, USA

Reliance on in-line-inspection Reports demands that tool data be verified and validated. This validation requirement, while technically prudent, will also be a recommended practice in new procedures being developed. Tool validation is a difficult task requiring detailed field measurements of features in a format that can be compared directly to the ILI data. This paper presents an overview of the validation process and describes the development and testing of a new device for measuring, documenting and assessing external corrosion on steel pipelines.

#### OPERATOR FORUM

A panel of pipeline operators will discuss their integrity management programs with respect to pigging and inspection activities, and highlight technical problems and solutions that are needed.

Invited: Duke Energy, Panhandle Energy, BP.

3.30 Coffee

4.00 Operator forum (see left)

5.30 End of day

## THURSDAY, FEBRUARY 10, 2005

8.30

### DETECTION OF MECHANICAL DAMAGE USING THE MAGNETIC FLUX LEAKAGE TECHNIQUE

LYNANN CLAPHAM, VIJAY BABBAR, AND  
JAMES BYRNE, QUEEN'S UNIVERSITY,  
KINGSTON, ON, CANADA

MFL application to mechanical damage detection faces hurdles which make signal interpretation problematic: the MFL signal is a superposition of geometrical and stress effects; the stress distribution around a mechanically damaged region is very complex, consisting of plastic deformation and residual

(elastic) stresses; and the effect of stress on magnetic behavior is not well understood. This paper summarizes recent results of experimental and modeling studies of MFL signals resulting from mechanical damage

9.00

### A NEW METHOD FOR CALIBRATING MFL AND UT ILI TOOLS

DR. LESTER ALFONSO, DR. FRANCISCO CALEYO, DR. J.M. HALLEN, AND  
DR. J.L. GONZALEZ, INSTITUTO POLITECNICO NACIONAL, MEXICO,  
D E. PEREZ-BARUCH, PEMEX, MEXICO

This paper describes a statistical methodology for the calibration of UT and MFL in-line inspection (ILI) tools which is based on the comparison of the ILI readings with field-measurements results. The systematic and random errors that affect both the ILI and the field tools are estimated and from this information, an unbiased estimation of the true depth of the defects detected by the ILI tool is produced. A generalization of the ILI tool rejection criteria is proposed and the influence of the number of field verifications on the reliability of the calibration process is addressed.

9.40

### REGULATION OF THE INTEGRITY OF GAS AND LIQUID TRANSMISSION PIPELINES

BY JOHN JACOBI, OFFICE OF PIPELINE SAFETY, US DOT

10.30 Coffee

11.00

### HIGH-QUALITY SMART PIG INSPECTION OF DENTS, COMPLIANT WITH THE CODE OF FEDERAL REGULATIONS FOR GAS AND LIQUID TRANSPORTATION LINES, PARTS 192 AND 195

THOMAS BEUKER,  
ROSEN TECHNOLOGY AND RESEARCH CENTER, LINGEN, GERMANY

This paper presents a novel technology for characterization and sizing of dents. This high-resolution ILI technology combines the advantage of a touchless electronic measuring system with the advantages of the well-established caliper arm tools. Insights into the system's design will be given as well as data samples explaining the functionality of the dynamic compensation method.

11.40

### VERIFICATION STUDIES OF BURIED PIPELINES INSPECTED WITH THE GUIDED-WAVE ULTRASONIC TECHNIQUE

SCOTT LEBSACK, LEBSACK & ASSOC., THE WOODLANDS, TX, USA

This paper reviews the guided-wave ultrasonic testing process used in Direct Assessment of unpiggable pipelines. It compares some of the field data obtained with the actual as-found pipe conditions, and looks at research under way in field applications of long-range ultrasonic technology. Next-generation equipment sets are already being developed and the capabilities of these units will permit more flexibility in data acquisition, improved sensitivity and extension of the inspection range.

12.20

### GUIDELINES TO DEVELOP FITNESS-FOR-SERVICE ASSESSMENTS IN OIL PIPELINES EXPOSED TO CORROSIVE AND GEOTECHNICAL ENVIRONMENTS

RAFAEL MORA, CC TECHNOLOGIES CANADA, CALGARY, AB, CANADA,  
CARLOS VERGARA AND GUY KREPPS, OLEODUCTO CENTRAL SA, BOGOTÁ, COLOMBIA

Based on the fitness-for-service assessment of a 436-mile oil pipeline in Colombia, this paper provides guidelines for pipeline operators exposed to corrosive and geotechnically-sensitive environments and high-consequence areas to develop long-term integrity plans. In this case, the pipeline-integrity plans were prepared based on the integration of data and assessments such as metal loss, geometry, and strain in-line inspections, product corrosivity, cathodic protection, geotechnical hazard identification, and pipe class location/high-consequence areas. Guidelines for developing near-term integrity plans are provided based on best industry practices and regulations.

1.00 Lunch

2.00

### ESTABLISHING A BASELINE INLINE INSPECTION PROGRAM ON A LARGE-DIAMETER HIGH-PRESSURE GAS TRANSMISSION AND INTERCONNECT SYSTEM

STEPHEN WESTWOOD,  
BJ PIPELINE INSPECTION SERVICES,  
CALGARY, AB,  
ARTI BHATIA,  
ALLIANCE PIPELINE LTD,  
EDMONTON, AB, CANADA

This presentation outlines the unique challenges the Alliance Pipeline System presented to both the operator and the inline inspection (ILI) vendor in developing a successful in-line inspection program. The trans-border nature of the pipeline means

that it needs to satisfy both the Canadian and US regulatory requirements related to pipeline integrity management. The presentation discusses the vendor selection criteria used by the pipeline operator and the design process undertaken by the ILI vendor to meet the requirements of this unique pipeline system.

2.40

### A TACTICAL APPROACH FOR MANAGED REHABILITATION AND MAINTENANCE PROGRAMS

TODD PORTER,  
TUBOSCOPE PIPELINE SERVICES,  
HOUSTON, TX USA

To arrive at an optimal rehabilitation and maintenance plan, proper use of existing data, new integrity-assessment data, and decision / risk models is required. This paper will detail the tactical aspect of an effective integrity management platform. Using case studies and experience in decision support, operations priorities and execution of a rehabilitation plan using the data described with LinaView Pro will be presented. A process overview, results, and benefits will be given using these examples from operating oil and gas transmission pipelines.

3.20

### ADVANCES IN PIPELINE INTEGRITY MANAGEMENT FROM AN INSPECTION COMPANY POINT OF VIEW

DEREK STOREY, ROSEN SWISS AG, STANS, SWITZERLAND, AND GUNNAR WEIGOLD, ROSEN TECHNOLOGY & RESEARCH CENTER, LINGEN, GERMANY.

This paper describes some of the important advances which have been made in pipeline integrity management technology, together with actual applications. The standard concept of engineering control is used as the framework for structuring and describing the integrity-management advances.

4.00 End of conference

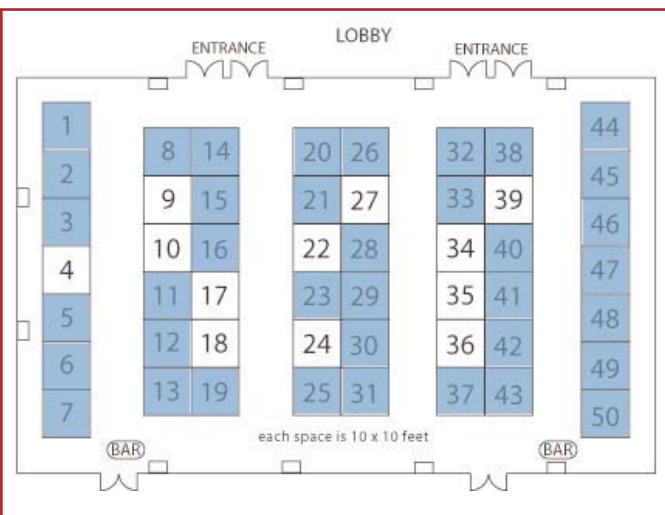
**CAN'T ATTEND THE CONFERENCE?  
DON'T MISS THE EXHIBITION!**

**A** key feature of the conference is the opportunity to visit one-on-one with the leading technology suppliers in this fast-evolving field. Exhibiting company representatives will be available to discuss the latest technologies for internal pipeline inspection and maintenance, as well as rehabilitation, repair, and other integrity-related services.

Exhibition-only registration is \$25.  
See the registration form on page 7.

**TO RESERVE EXHIBITION SPACE**  
Visit [www.clarion.org](http://www.clarion.org) or call (713) 521-5929.

**EXHIBITION FLOORPLAN**



# PIPELINE PIGGING & INTEGRITY MANAGEMENT

COURSES • CONFERENCE • EXHIBITION

**EXHIBITORS** (as of press time)

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**EXHIBITION HOURS**

Tuesday	February 8, 2005	5:00pm-6:30pm
Wednesday	February 9, 2005	8:30am-6:30pm
Thursday	February 10, 2005	8:30am-2:00pm

# REGISTRATION FORM

## CONFERENCE AND COURSE REGISTRATION (check as appropriate)

- Conference February 9-10: \$895
- Pigging and In-Line Inspection Course February 7-8: \$1595
- Defect Assessment in Pipelines Course February 7-8: \$1595
- Direct Assessment Course February 7-8: \$1595
- Pipeline Repair Methods/InService Welding Course February 7-8: \$1595
- Pigging and In-Line Inspection + Conference: \$2290
- Defect Assessment Course + Conference: \$2290
- Direct Assessment Course + Conference: \$2290
- Pipeline Repair Course + Conference: \$2290

For fastest registration, register online now at [www.clarion.org](http://www.clarion.org) (secure server.)

OR fax or mail this form to:  
**CLARION Technical Conferences**  
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FAX (713) 521- 9255  
Tel. (713) 521-5929

## DISCOUNTS (check as appropriate)

- Multiple registrations from the same company: \$150 discount per person
- Early Registration: \$100 discount (registrations received prior to January 10, in addition to discounts above)
- ASME Members: 20% discount (may not be combined with other discounts) Member No: \_\_\_\_\_

## EXHIBITION-ONLY REGISTRATION

- \$25

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## ACCOMMODATION

Fees do NOT include accommodation.

The course will be held at

**Wyndham Greenspoint Hotel**

**12400 Greenspoint Drive**

**Houston, Texas 77060**

**Tel. +1.281.875.2222**

**web: [www.wyndham.com/hotels/IAHGP/main.wnt](http://www.wyndham.com/hotels/IAHGP/main.wnt)**

Don't forget to say you are attending the Pipeline Pigging and Integrity Management Conference to take advantage of the special rate (limited availability).

## CANCELLATIONS/SUBSTITUTIONS

Cancellations made in writing and received on or before 10 business days prior to the course will be refunded less a \$50 handling fee. Cancellations received after 10 business days prior to the course will not be refunded, and the full invoice fee will be payable regardless of whether you attend the event or not. Substitutions may be made at any time. The organizers reserve the right to cancel any workshop due to insufficient enrollment. In this event fees will be refunded in full.

**However, the organizers assume no liability for travel or any expenses other than fees paid.**

REGISTER ONLINE AT [WWW.CLARION.ORG](http://WWW.CLARION.ORG)

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