

Agenda for 2013 Conference

Tuesday, April 16, 2013

#	Day	When	Author(s)	Affiliation	Title
		6:00 – 7:30			Ice Breaker & Registration Opens

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Wednesday, April 17, 2013

Leak Detection					
1301	Wednesday	8:30 – 9:15	Jianping Gao	Enbridge	<p>Online implementation of Data Smoothing Technology for Leak Detection</p> <p>This paper discusses the online implementation of data smoothing program for leak detection that filters the live SCADA data to improve data quality of input to leak detection system, and improve the leak detection capability in Enbridge. The presentation will address the implementation process, issues arising and analyze the online test results.</p>
1302	Wednesday	9:15– 10:00	Diana Michkova	EnergAvtomatika	<p>Mathematical modeling of wave processes in leak detection systems (LDS)</p> <p>This paper addresses the problem of minimizing the false leak detections and increasing sensitivity of the leak detection system by applying mathematical modeling of oil flow. The presentation will include a brief overview of existing leak detection algorithms, description of the proposed mathematical model, and results of detecting real leaks using the model.</p>
		10:00 – 10:15			Break
1303	Wednesday	10:15 – 11:00	Jun Zhang, Keefe Murphy, John Lewis, Michael Twomey Andy Hoffman	ATMOS International ATMOS Wave	<p>Review of Pipeline Leak Detection Technologies</p> <p>This paper describes four different leak detection technologies and their applicability to different pipelines. The presentation will discuss the advantages and disadvantages of each technology, the important performance criteria and benefit of combining some of the technologies.</p>
1304	Wednesday	11:00 – 11:45	Philip Carpenter Morgan Henrie Ed Nicholas Paul Liddel	Great Sky River Enterprises, LLC MH Consulting, Inc Nicholas Simulation Services Alyeska Pipeline Service Company	<p>Automated Validation and Evaluation of Pipeline Leak Detection System Alarms</p> <p>We describe a prototype system that evaluates alarms generated by a model-based pipeline leak detection system. Output of the validation system is a Bayesian-based calculation of the actual leak probability associated with the alarm, and, in the event that the assessment system determines that the leak probability is low, an indication of the specific instrumentation or modeling errors that may be contributing to the alarm. The paper provides a statement of the problem, historical methods used to address it, a brief mathematical background for the system, a description of the system as currently implemented, and plans for the future.</p>
		11:45 – 1:30			Lunch

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Carbon Dioxide Transportation and Gas Quality					
1305	Wednesday	1:30 – 2:15	Antonie Oosterkamp, Sigmund Clausen, Willy Postvoll	Polytec Gassco AS	Steady-state pipeline transmission of CO ₂ – a benchmarking study This paper contains the results of an investigation conducted at Gassco AS into the sensitivity of pipeline flow modeling for steady state pipeline transmission of CO ₂ Two cases were modeled using different pipeline flow simulation solutions and different fluid property correlations. In the presentation, resulting sensitivities for density and viscosity calculation will be presented and the modeling results compared with actual flow data.
1306	Wednesday	2:15 – 3:00	Ben Wetenhall, Julia Race, Martin Downie	Newcastle University	The Effect of Impure Streams on Pipeline Networks for Carbon Capture and Storage The paper looks at the economics of an integrated regional CO ₂ pipeline transportation network connecting ten typical power stations and the effect of impurities on the costs of the networks connecting them.
		3:00 – 3:15			Break
1307	Wednesday	3:15 – 4:00	Andrew Cosham, David G Jones, Keith Armstrong, Dan Allason and Julian Barnett	Atkins, Pipeline Integrity Engineers, GL Noble Denton, National Grid	An Experimental and Theoretical Study of the Decompression Behaviour of Carbon Dioxide National Grid has undertaken a programme of shock tube tests to investigate the decompression behaviour of CO ₂ -rich mixtures in the gas phase and the liquid (dense) phase in a pipeline immediately following a rupture in a pipeline. The results of the shock tube tests are presented, and the observed decompression behaviour is compared with that predicted using a simple (isentropic) decompression model. The differences between decompression through the gas and liquid phases are highlighted.
1308	Wednesday	4:00 – 4:45	Dr. Jon Barley	Energy Solutions International	Using CPM Tools For Gas Quality Control Entry specification for gas entering the UK National Transmission System (NTS) is specified by key fluid quality parameters: CO ₂ content, Wobbe Index, Soot Index and Incomplete Combustion Factor, etc. This paper discusses the development and usage of a CPM tool for computing and tracking the necessary gas qualities from their source to the plant prior to processing and introduction into the NTS.

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Compressor Modeling					
1309	Wednesday	8:30 – 9:15	Mr. Augusto Garcia-Hernandez Klaus Brun Rainer Kurz	Southwest Research Institute Solar Turbines	Transient Analysis of Centrifugal Compressors Centrifugal compressors are subject to transient events, such as emergency shutdowns, that could originate energetic surge events during these rapid shutdown transients. Many modeling tools are used to predict the behavior of the compressor system during fast transient events. However, many key parameters of the modeling are critical to obtain accurate results; thus, a generic methodology to improve modeling predictions and main considerations are presented in this paper. In general, this work should provide guidelines for advancing the modeling of centrifugal compressor transients as well as showing the application of a valuable tool for designing surge control systems for centrifugal compressors.
1310	Wednesday	9:15– 10:00	Sidney P. Santos Matt Lubomirsky Rainer Kurz	At Work Rio Engineering and Consulting Solar Turbines	Design Alternatives for High Ratio Compressor Stations A methodology for high ratio compressor station design is presented addressing single and dual compartment centrifugal compressors best selection where both choices are adequate to perform the gas compression service. Technical end economic – and not only technical – aspects are taken into account.
		10:00 – 10:15			Break
1311	Wednesday	10:15 – 11:00	Dr. Hans Aalto	Neste Jacobs Oy	Simplified Real-time Optimization of the Gas Pipeline Network Saves Compression Energy Dynamic, or transient, real-time optimization is tackled by using the Model-Predictive Control concept well-known in the hydrocarbon industry. Pipeline dynamics and compressor characteristics approximations are thus needed, but doing them properly ensures savings in compressions energy on a 24/7 basis. Other optimization issues, such as throughput optimization and gas delivery planning are also discussed.
1312	Wednesday	11:00 – 11:45	Augusto Garcia-Hernandez Hector Delgado Garibay	Southwest Research Institute	Dynamic Analysis of a Multi-Stage Compressor Train A multiple-stage compressor train which is part of an off-shore booster installation was facing process and mechanical related problems. The frequency of these problems has increased lately, and this has led to frequent trips and shut downs. Thus, a detailed dynamic model of the multi-stage compression system was built and used to analyze the

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					compression process including its anti-surge system. Several simulation cases were conducted to evaluate the effect of various control parameters and valve configurations. This paper summarizes the results of the dynamic analysis and provides recommendations to solve some of the existing issues while understanding more of the dynamics of the system.
		11:45 – 1:30			Lunch
			Liquid Flow Improvement		
1313	Wednesday	1:30 – 2:15	Dr. Martin Liu, Dr. Aleksej Lisunkin, Michael Krätsch, Klaus Luber Rene Dietsch	PSI AG Dow Olefinverbund GmbH	Safety Integrity Certification for Pipeline Leak Detection System This paper discusses the safety integrity certification for a pipeline leak detection system for a network of ten pipelines for the transport of raw materials and products to and from production plants in Eastern Germany. The presentation will discuss the methodology and the set of activities that have been developed to meet the required safety integrity level.
1314	Wednesday	2:15 – 3:00	Hesham A. M. Abdou	Agiba Petroleum Co.	Role of Simulation System in Maximizing Transportation Capacity of an Aged Pipeline This paper describes methods applied to maximize pipeline transportation capacity of an aged 100 mile long 16” pipeline. Since November 1984, capacity has increased from 100,000 bbl/d up to 177,000 bbl/d without exceeding maximum allowable working pressure which dropped from 1463 psi to 950 psi. The applied methods are mathematically modeled to simulate pumping operations in each.
		3:00 – 3:15			Break
1315	Wednesday	3:15 – 4:00	Svetlana Strelnikova	EnergoAvtomatika	Mathematical modeling of fluid motion in pipelines using drag reducing agents The paper offers accounting principle of drag reducing agents in mathematical model of a flow motion in oil pipelines. The presentation will include brief overview about the operating principle of drag reducing agents (Toms effect), equations of the proposed model and comparison of the model computations with experimental data from operational oil pipeline.
1316	Wednesday	4:00 – 4:45	Hesham A. M. Abdou	Agiba Petroleum Co.	Case History in Success of Handling Heavy Crude Oils Using Proper Designed Flow Simulation Program This paper describes a successful method applied to transport produced heavy crude oil (1,085 centipoise @ 16 deg C & 0.97 sp.gr. @ 60 deg F & 14.7 psi) from well heads to production manifold, and to the processing area.

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					Rehabilitation of the existing pipe network to increase its handling capacity is discussed. The applied method is mathematically modeled to simulate flowing of heavy oil on using such applied method.

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Thursday, April 18, 2013

		8:30			Conference Start
1317	Thursday	8:30 – 9:15	Nga Thanh, Aurélie Le Maître, Julien Ardeois, Jean-Baptiste Joliot	GDF SUEZ, Research and Innovation Division: RTgaz	<p align="center">An Optimization Tool for Network Capacities</p> <p>This paper presents an optimization tool that CRIGEN developed for GRTgaz. This tool helps GRTgaz, the main French transmission network operator, to determine how much capacities they can commercialize or restrictive. This paper has four main parties. In the first one, we will give an overview of GRTgaz contractual and physical network and show how complex it is to commercialize reliable transmission capacities. Then we specify the problem of scenario feasibility-checking with a focus on inter-connecting stations. We present after how to calculate the capacities of a network and show a use case of the optimization tool developed.</p>
1318	Thursday	9:15– 10:00	Steve Alfred, Jonathan Fasullo and John Pfister Andrew Daniels	CenterPoint Energy Gas Transmission GL Noble-Denton	<p align="center">Capacity Determination using State Finding and Gas Transient Optimization</p> <p>This paper discusses CenterPoint Energy’s use of a transient optimization-based approach for determining the current state and capacity of its transmission pipeline. The presentation will describe how transient optimization fits into CenterPoint Energy’s daily process, and will discuss model setup and optimization results.</p>
		10:00 – 10:15			Break
1319	Thursday	10:15 – 11:00	Tibor Žáčik, Peter Somora, Rudolf Hajossy	Mathematical Institute Slovak Academy of Sciences	<p align="center">Modeling and Optimizing in Slovak Gas Transmission Network</p> <p>This paper discusses different tasks and criteria (e.g., minimum costs, prescribed line pack, maximum flow, etc.) together with optimization methods used in the Slovak gas transmission network. The optimizations are based mainly on dynamic programming and stochastic evolutionary algorithms. Specialties of used models (e.g., multilayer network computation, automatic selection of compressor configuration) are emphasized. These specialties and (massive) parallel calculations make the optimization sufficiently precise and quick for daily use.</p>
1320	Thursday	11:00 – 11:45	Ben Velde, Willy Postvoll Garry Hanmer, James	GASSCO ATMOS International	<p align="center">Application Benefit of the Online Simulation Software for Gassco’s Subsea Pipeline Network</p> <p>This paper discusses the application benefits of online</p>

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			Munro		simulation software for Gassco's subsea pipeline network. The on-line simulation software is applied to the subsea single phase pipeline network of 7,800 km (4,847 mile) length. With the successful implementation of the simulation software, Gassco control room operators are able to run the complex networks confidently, reliably and predictively. A few real life operating scenarios will be used to demonstrate the commercial and technical advantages of the on-line software.
		11:45 – 1:30			Lunch & Chairman's Session
		1:30 – 2:15			Networking & Exhibits Open
1322	Thursday	2:15 – 3:00	Jason Modisette	ATMOS International	<p>State Estimation of Pipeline Models using the Ensemble Kalman Filter</p> <p>Online pipeline models are typically provided with more metering than is strictly needed for boundary conditions, but also with a system with many unknowns: pipe roughness, meter errors, ambient thermal conditions, etc. This paper discusses a new scheme for state estimation and tuning using the Ensemble Kalman Filter (EnKF), a mathematical technique that has previously been applied to weather modeling, to find the optimal tradeoffs between conflicting meter and the values of unknown parameters of the system. Application of the EnKF to state estimation, tuning, and leak location on liquid and gas pipelines will be presented.</p>
		3:00 – 3:15			Break
1323	Thursday	3:15 – 4:00	Dr. Tom van der Hoeven	GasTerra B.V.	<p>Visual Storage Scheduler</p> <p>With the Visual Storage Scheduler, the usage of storages can be scheduled by stapling the deliverability curves along the integrated load duration curve. This can be done in a multi period session. The order of usage comes natural. This approach is new and will be subject of this presentation.</p>
1324	Thursday	4:00 – 4:45	Jan Kubálek Pavel Reinštein	NET4GAS SIMONE Research Group	<p>Practical Application of Pipeline Models for Short-term Operational Planning of Natural Gas Transportation</p> <p>This paper discusses a possibility of using various modeling techniques, such as real time transient model, online look-ahead model and some offline calculations for operational planning. Special emphasis is placed on effective network operation on the nominations and allocations. Practical use can be demonstrated on the implementation at NET4GAS, which is the major gas transmission system operator in the Czech Republic.</p>
		6:00 – 7:30			Reception

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Friday, April 19, 2013

		8:30			Start
1325	Friday	8:30 – 9:15	Shawn Learn Colin Cooper Joe Yip	Transcanada	<p>Pipeline Design for Availability - Linepack Mitigation</p> <p>Linepack is often used to mitigate outages on gas pipelines, but how do we consider linepack as outage mitigation during the design of a pipeline? This paper examines one methodology of determining the potential of linepack mitigation when doing reliability based design for a gas pipeline. The paper also defines a process for determining the predicted availability of a pipeline as determined by Monte Carlo simulation.</p>
1326	Friday	9:15– 10:00	Srihari Kumar Vanam Fábio Capelassi Gavazzi de Marco, José Schuwa Kasai Nicioka	Energy Solutions International TBG - Transportadora Brasileira do Gasoduto Bolívia-Brasil S.A.	<p>The Advantages of an Integrated Solution....</p> <p>This paper describes the TBG gas pipeline scheduling methodology and the advantage gained by integrating the pipeline operational management system and the gas management system to generate a gas pipeline schedule by utilizing the maximum capacity of the pipeline without violating the operational and commercial constraints under day to day fully dynamic pipeline operation with changing needs for gas.</p>
		10:00 – 10:15			Break
1327	Friday	10:15 – 11:00	Flavia Viana, Augusto Garcia-Hernandez, Kevin Supak	Southwest Research Institute	<p style="text-align: center;">Hydrate Formation and Slugging Assessment of an Offshore Gas Field</p> <p>This paper presents a flow assurance study that was conducted to improve the design and reliability of an off-shore transporting gas system. This paper presents the methodology used in the assessments as well as the results obtained for the steady state and transient cases. In addition, some recommendations for improving the design and operation of the system are also provided.</p>
1328	Friday	11:00 – 11:45	Reiner Hüls	DUtrain GmbH	<p style="text-align: center;">Training-Simulator for Operating Gas Systems</p> <p>This paper represents a training simulator for dispatcher. Gas systems regardless whether they are national transmission networks, regional transmission grids or networks of the public gas suppliers, are controlled 24 hours a day and 365 days per year from corresponding dispatching centres. The task of the responsible dispatchers is, to know the characteristics of their networks in normal mode, as well as to</p>

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					recognize any deviations from this normal mode and to take appropriate counteractions if necessary. Normally, a possibility to train the required actions does not exist. As a result of the performed training courses for combined distribution control centres during the last years a training-simulator for operating gas systems has been developed. With this simulator it is possible to map a gas system efficiently enough, to bridge this gap.
		11:45			Conference Close