PIPELINE INTEGRITY INSTITUTE
INSTITUT D'INTÉGRITÉ DE PIPELINE

Course 1 - Introduction to Onshore Pipeline Engineering

Monday, March 8 - Tuesday, March 9, 2021 (8:00am – 12:30pm PST)

By Phil Hopkins

Course 2 – Pipeline Integrity Management

Wednesday, March 10 – Thursday, March 11, 2021 (8:00am – 12:30pm PST)

By Alan Murray

Introduction

There are millions of kilometres of high-pressure onshore oil and gas transmission pipelines around the world. As the industry expands and new staff are introduced into it, there is an increasing need for a full appreciation of the engineering design of pipelines and how to keep them operating safely. Additionally, many staff in the pipeline industry have not received basic pipeline engineering training, and some staff are only exposed to specialized areas. These two courses provide both an introduction to pipeline engineering, and a more in-depth look at pipeline integrity management.

Course 1 (2 half-days) is 'An Introduction to Onshore Pipeline Engineering'

by Dr. Phil Hopkins

Aimed at staff who require an introduction to onshore oil and gas pipeline engineering. It introduces the fundamentals of pipeline engineering, through the whole pipeline life cycle, from design, to construction, to operation.

Course 2 (2 half days) is 'Pipeline Integrity Management'

by Dr. Alan Murray

Aimed at staff who are involved with pipeline integrity management. It covers pipeline integrity management plans, risk assessment and mitigation, and inspection programs.

Who Should Attend

Course 1: Engineers and Technologists new to the pipeline business or with less than 3 years' experience including: Pipeline Engineers, Pipeline Construction Engineers, Project Managers, Maintenance Engineers, Inspectors, Pipeline Operators, Equipment Suppliers, Inspection and Quality Engineers, Pipeline Design Engineers, Legislators and Regulators.

Course 2: Engineers and Technologist involved in pipeline integrity management, including: Pipeline Integrity Engineers, Project Managers, Maintenance Engineers, Inspectors, Pipeline Operators, Equipment Suppliers, Inspection and Quality Engineers, Legislators and Regulators.

Courses Format

These are **on-line** courses. Start time is 08.00. Finish time is 12.30 PST.

Course Objectives

On completion of the courses, attendees should be able to:

- Explain pipeline engineering concepts;
- Discuss why safety is the priority in design;
- Outline pipeline design and the design process;
- Summarize pipeline design, construction and operating practices;
- Explain the purpose and use of a Safety and Loss Management system
- Apply pipeline integrity management principles and practice;
- Choose pipeline integrity management plans;
- Select and organise an appropriate pipeline risk assessment method and,
- Identify key performance indicators explaining their role in Continuous Improvement.

SCHEDULE - Course 1:

TRAINING COURSE 1: AN INTRODUCTION TO ONSHORE PIPELINE ENGINEERING By Dr Phil Hopkins 8th – 9th March, 2021		
Monday, 8th March, 2021	08.00	**WELCOME AND INTRODUCTIONS**
	08.15 – 09.00	**PIPELINE BASICS:** The oil and gas business Pipelines: history and basics Pipeline: engineering principles Line pipe
	09.00	**Coffee Break**
	09.15 – 10.00	**PIPELINE BASICS (cont.)**
	10.00	***Questions and Answers***
	10.15	**Coffee Break**
	10.30 – 11.15	**PIPELINE DESIGN:** Design process Standards and regulations Substance classification Design factor, location class, design pressure Calculating pipe diameter and wall thickness Hydraulics
	11.15	**Coffee Break**
	11.30 – 12.15	**PIPELINE DESIGN (cont.)**
	12.15 – 12.30	***Questions and Answers***
	Close of Day 1 at 12.30	

TRAINING COURSE 1: AN INTRODUCTION TO ONSHORE PIPELINE ENGINEERING By Dr Phil Hopkins 8th – 9th March, 2021		
Tuesday, 9th March	08.00– 09.00	**PIPELINE CONSTRUCTION:** Pipeline routeing Onshore construction Welding new pipelines Road/rail/sea crossings Pressure testing (on new pipelines and in-service pipelines)
	09.00	**Coffee Break**
	09.15 – 10.00	**PIPELINE CONSTRUCTION (cont.)**
	10.00	***Questions and Answers***
	10.15	**Coffee Break**
	10.30 – 11.15	**PIPELINE BENDS, VALVES, PROTECTION:** Field and manufactured bends Valves – purposes and types Pipeline protection – reasons and methods
	11.15	**Coffee Break**
	11.30 – 12.15	**PIPELINE OPERATION:** Operation and control Pipeline inspection and surveillance
	12.15- 12.30	***Questions and Answers***
	Close of Course 1 at 12.30	

SCHEDULE - Course 2:

TRAINING COURSE 2: PIPELINE INTEGRITY MANAGEMENT By Dr Alan Murray 10th – 11th March, 2021		
Wednesday, 10th March	08.00	**WELCOME AND INTRODUCTIONS**
	08.15 – 09.00	**PIPELINE INTEGRITY MANAGEMENT:** • History and Overview of Pipeline Integrity Management and Asset Protection. • Overview of Safety and Loss Management • Elements of an Integrity Management Plan (IMP) • Case Study in IMPs
	09.00	**Coffee Break**
	09.15 – 10.00	**PIPELINE INTEGRITY MANAGEMENT (cont.)**
	10.00	***Questions and Answers***
	10.15	**Coffee Break**
	10.30 - 11.15	**APPROACHES TO RISK ASSESSMENT ANALYSIS**: • Threat Identification • Qualitative and Quantitative Approaches • Risk Acceptability • Prevention and Mitigation Measures
	11.15	**Coffee Break**
	11.30 – 12.15	**APPROACHES TO RISK ASSESSMENT ANALYSIS** (cont.)
	12.15	***Questions and Answers***
	Close of Day 1 at 12.30	

TRAINING COURSE 2: PIPELINE INTEGRITY MANAGEMENT By Dr Alan Murray 10th – 11th March, 2021		
Thursday, 11th March	08.00 – 09.00	**PIPELINE INTEGRITY ASSESSMENT:** • Determining the Pipe Condition: Inspection; Hydro testing • In Line Inspection Methods: Characteristics and Limitations • Matching the Inspection and Assessment Method to the Threat • Key Performance Indicators and Continuous Improvement
	09.00	**Coffee Break**
	09.15 – 10.00	**PIPELINE INTEGRITY ASSESSMENT (cont.)** • Overview of Approaches to Defect Assessment • Corrosion and Cracking
	10.00	***Questions and Answers***
	10.15	**Coffee Break**
	10.30 – 11.15	**PIPELINE INTEGRITY ASSESSMENT (cont.)** • Case Study on Defect Assessment • Common Repair Methods
	11.15	**Coffee Break**
	11.30 – 12.15	**INTEGRITY MANAGEMENT PLANS FOR FACILITIES.** • Maintenance Methods • Use of Risk-based Inspections and Condition Monitoring
	12.15	***Questions and Answers***
	Close of Course 2 at 12.30	

COURSE TRAINERS

Dr Phil Hopkins is an independent consultant, with his own company: Phil Hopkins Learning Ltd., and has 40 years' experience in the pipeline industry. He was previously Executive Director of the pipeline engineering company Penspen Limited, UK, and Managing Director of the pipeline-engineering consultants, Andrew Palmer and Associates (APA), UK.

He had worked in the power generation industry, before spending 17 years working in the Research and Technology Division of British Gas, UK. Dr Hopkins continues to be involved with universities: he was a Professorial Fellow at Newcastle University, UK, and has taught on Masters Programs at both Newcastle University, and Northumbria University, UK.

He is a past Chair of the American Society of Mechanical Engineers (ASME) Pipeline Systems Division. He is a Fellow of the ASME and the IMechE in the UK, and the co-author of the ASME Press textbook 'Pipeline Integrity Management Program and System - A practical approach'. American Society of Mechanical Engineers. New York, USA. 2016.

Dr Alan Murray is a consulting engineer with Principia Consulting in Calgary, AB. Prior to forming Principia in 2010; he was Chief Engineer at the Canadian National Energy Board. Dr Murray's industry experience has included a number of senior management positions with a large pipeline operating company in North America with responsibility for system planning, construction, maintenance and contracting functions.

His 45 years of work experience spans research, regulation, third-party assessment, design and development in pipelines and offshore structures. He was the founding Chair of the ASME Pipeline Systems Division, is the co-author of the ASME Press textbook 'Pipeline Design and Construction – A Practical Approach and Pipeline Integrity Assurance', and is a Fellow of the ASME.