

PIPING AND INSTRUMENTATION DIAGRAMS (P&ID) ENGINEERING DRAWINGS INTERPRETATION

| | COURSE # | COURSE NAME | LOCATION | DATE |
|-------------|-----------------|---------------------|-----------------|----------------|
| 2010 | 010-463 | P&ID Interpretation | San Diego, CA | Oct 4-5 |
| | 010-436 | P&ID Interpretation | Calgary, AB | Oct 18-19 |
| | 010-468 | P&ID Interpretation | Houston, TX | Nov 1-2 |
| | 010-445 | P&ID Interpretation | Calgary, AB | Dec 6-7 |
| 2011 | 011-401 | P&ID Interpretation | Calgary, AB | Jan 3-4 |
| | 011-411 | P&ID Interpretation | San Diego, CA | Jan 31 – Feb 1 |
| | 011-421 | P&ID Interpretation | Calgary, AB | Feb 28 – Mar 1 |
| | 011-431 | P&ID Interpretation | San Diego, CA | April 4-5 |
| | 011-441 | P&ID Interpretation | Calgary, AB | May 2-3 |
| | 011-451 | P&ID Interpretation | San Diego, CA | June 6-7 |
| | 011-461 | P&ID Interpretation | Calgary, AB | July 4-5 |
| | 011-471 | P&ID Interpretation | San Diego, CA | Aug 1-2 |
| | 011-481 | P&ID Interpretation | Calgary, AB | Sept 12-13 |
| | 011-491 | P&ID Interpretation | San Diego, CA | Oct 3-4 |
| | 012-401 | P&ID Interpretation | Calgary, AB | Nov 7-8 |
| | 012-411 | P&ID Interpretation | San Diego, CA | Dec 5-6 |

Course Fee: **\$1,250 CDN** per student

The course fee includes registration, lunch and refreshments, and course materials. Price is exclusive of applicable taxes. Courses held in the U.S are billed in U.S. dollars.

BUILDING A SOLID FOUNDATION

Safety issues, design/installation defects and mal-operation all have a financial impact that can be greatly reduced by properly training employees who have a solid foundation in the fundamentals of P&ID interpretation.

P&ID COURSE TESTIMONIALS

Here are a few quotes from over 400 students we've trained in the last two years;

- *"My first time involved with this level of detail in a P&ID and it was very informative." "Great course. I learned a lot. A must for anyone using P&IDs."*
- *"The extensive field experience of the instructor really impressed me." "Great teacher. Very knowledgeable."*
- *"I feel I learned a lot of new concepts. I would recommend this training."*

BENEFITS OF PIPING AND INSTRUMENTATION DIAGRAMS (P&ID) PROGRAM

- This course will provide employees with the ability to understand how the facilities relate to the drawings so that they can focus on improvements.
- Accurate drawings and the ability to read and understand these drawings are a requirement for the analysis of emergency situations and the assessment of safety, environmental and regulatory compliance issues such as Process Hazards Analysis / HAZOP studies.
- This course will also provide engineers dealing with Management of Change the ability to speak the same language as the operators of the facilities.
- It will form the foundation for base level learning and will provide consistent and improved communications between staff.
- It will provide improvement in quality and consistency which will enhance the other processes that rely on the P&ID drawings.

P&ID TRAINING COURSE OBJECTIVE

The course is comprised of combined classroom instruction and workshop exercises. The instructor focuses on critical documentation, such as **P&ID, PFD, Plot Plan, Electrical Area Classification, Piping Drawing, Isometric Drawing, Line List, Tie-In List and Shutdown Keys** which are essential for safe day to day operation of facilities. Accurate drawings are a requirement for the analysis of emergency situations and the assessment of safety, environmental and regulatory compliance issues. They are also prerequisites for Process Hazards Analysis / HAZOP studies. A workshop helps demonstrate the keys to reading and interpreting various drawings.

WHO SHOULD ATTEND P&ID TRAINING?

This course introduces the various drawings typically used in the chemical and process industry by engineers and technologists in the design phase, and operations and maintenance staff once facilities are built and running. Anyone, including employees, managers, and officers of corporations with an interest in increasing their awareness of how these common engineering drawings should be created, maintained and used in emergency situations in the assessment of safety, environmental and regulatory compliance issues are welcome to attend.

- Facilities, Operations and Maintenance Professionals

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- Engineers In Training (EITs)
 - I & C, Mechanical engineers and technologists
 - Professionals responsible for Process Hazards Analysis / HAZOP / Safeguarding studies.

P&ID TRAINING COURSE INSTRUCTORS

Mr. Marcel Leal-Valias, CET

Mr. Leal-Valias has 47 years experience in Engineering, Process Design & Drafting, mechanical maintenance, and project management. Mr. Leal-Valias has been a Piping Manager, Construction Site Manager, Project Manager and for the last 15 years, he has developed and become an internationally respected Process Hazards Analysis (PHA/HAZOP) trainer and facilitator performing hundreds of PHA studies for all types of facilities.

Mr. Bill South

Mr. South has over 35 years experience in piping, layout and design in all aspect of sizing, layout, routing, stressing, design of supports, spooling isometrics, material take-off and control and man-hour estimating. Bill is a trained Process Hazards Analysis (HAZOP) facilitator who has held managerial responsibilities for SNC Lavalin, Fluor Corporation and Fish Engineering. Bill has a certificate from George Brown College in Toronto in Engineering Technician & Drafting and is a past member of the Process Piping Advisory Committee at S.A.I.T.

P&ID TRAINING COURSE AGENDA

I. INTRODUCTION

- Standards and Regulations (ANSI, ASME, ASTM, API, CSA, ISA, OSHA)
- Canadian Legislation/Alberta Legislation
- APEGGA Guidelines for Ethical Practice/ASET Code of Ethics
- Drawings in Project Lifecycle
- Document Control

II. PRELIMINARY ENGINEERING DRAWINGS

- Block Flow Diagram (BFD)
- Process Flow Diagram (PFD)
- Material Balance
- PFD Symbols

III. PIPING AND INSTRUMENTATION DIAGRAMS

- Piping and Instrumentation Diagram (P&ID)
- P&ID Symbols
- Line Numbering

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- Valve Numbering
 - Equipment Identification
 - Abbreviations

IV. INTERPRETING P&IDs - VALVES

- Valve Types
- Valve Identification
- Valve Fittings

V. INTERPRETING P&IDs - EQUIPMENT

- Vessels
- Pumps
- Heat Exchangers
- Compressors
- Equipment Identification

VI. INTERPRETING P&IDs – CONTROL & SAFETY SYSTEMS

- Distributed Control Systems (DCS)
- Safety Instrument System (SIS)
- Instrument Symbols
- Instrument Signal Lines
- Pressure Instruments
- Temperature Instruments
- Flow Instruments

VII. DRAWING INTERPRETATION WORKSHOP #1

VIII. DETAILED ENGINEERING DRAWINGS

- Plot Plan
- Electrical Area Classification
- Piping Drawing
- Isometric
- Material Take Off
- Line List
- Tie-in List
- Shutdown Key

IX. DRAWING INTERPRETATION WORKSHOP #2

X. ENGINEERING DRAWINGS FOR CONSTRUCTION AND OPERATION

- Developing As-Builds
- Preparing for a PHA (HAZOP, What-If, etc)
- Management of Change (MOC)

CONTACT ACM TO REGISTER




Registration form available at : www.acm.ab.ca/register

Contact Jacqueline Schmautz for further information at jschmautz@acm.ab.ca

or call toll free at 1-877-264-9637

- *ACM Facility Safety is a recognized global provider of Process Safety training, tools and methodologies*
- *ACM prides itself on neutral, third party unbiased workshop oriented training sessions developed from real life experiences of our instructors*
- *Our instructors have lived and implemented all phases of the IEC 61511 Safety Lifecycle during their careers at some of the world's largest operating companies*
- *Our lead instructors are practitioners with industry experience and are available for private in-house sessions at your facilities*

OUR LEAD INSTRUCTORS

| "We developed these courses and workshops based on real life situations" | "Global Expertise" | "Lived all phases of the Safety Lifecycle" |
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|  <p>Malcolm Harrison, B.Sc. Mech. Eng., P.Eng., TÜV F. S. Expert</p> <p>Mr. Harrison is a P. Eng. with over 40 years experience in Instrumentation and Controls. Malcolm spent over 35 years with Shell and has diversified upstream and midstream experience in the heavy oil, offshore, refining and gas processing sectors. He is an experienced SIL Determination facilitator and has worked on billion dollar projects ensuring horizontal I & C alignment between multiple EPCMs. Malcolm is a TÜV Functional Safety Expert and leads training workshops globally for ACM.</p> |  <p>Marcel Leal-Valias, CET, PHA/PSM Expert</p> <p>Mr. Leal-Valias has 47 years experience in Engineering, Process Design & Drafting, mechanical maintenance, and project management. Mr. Leal-Valias has been a Piping Manager, Construction Site Manager, Project Manager and for the last 20 years, he has developed and become an internationally respected Process Hazards Analysis (PHA/HAZOP) trainer and facilitator performing hundreds of PHA studies for all types of facilities. Mr. Leal-Valias has a broad operational understanding of all exploration, production and refining facets of the oil and gas industry as a result of 45 years spent in international postings in Brazil, Australia, and Canada.</p> |  <p>Ken Bingham, CET, TÜV F. S. Expert</p> <p>Mr. Bingham is the Principal of ACM Facility Safety, Chief Technology Officer and a TÜV certified Functional Safety Expert. His background is in engineering design and management, involving safety, instrumentation, electrical and control systems. With Ken's 27 years on the client side, integration side and the SIL consulting side, he brings a holistic and practical perspective. Mr. Bingham has participated on ISA S84 SIL standard committees, has presented numerous papers and courses on SIL Analysis and is the Chief Technical Architect for ACM's field proven, IEC 61511 compliant Safety Integrity Level (SIL) Life Cycle tool, SilCore™ the only tool in the world that prepares you in real time for loss of safeguards and ACM's MP Real-time risk exposure tool with contingency planning.</p> |