

Liquid Piping Systems Fundamentals

A practical and interactive two day seminar



KASA Redberg
Engineers & Technical Trainers

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Liquid Piping Systems Fundamentals

Introduction

As a rule of thumb, “Piping” accounts for (i) 30 percent of the material costs of a process plant or water treatment facility (ii) 30 percent of the construction labour and (iii) 40 percent of the total engineering time expended in designing, installing or commissioning a plant. Despite piping systems accounting for such a large “chunk” of an overall plant, it is amazing how so many errors are made with regard to the design of such systems. For example, the incorrect selection of piping materials, end connections, valves, fittings and support systems are all too common in industry.

The purpose of this two day seminar is to provide a basic instruction on the design, operation and maintenance of liquid piping systems.

Who Should Attend?

Process, Design, Project and Consulting Engineers; Line Managers and Supervisors; Maintenance Technicians; Pump Sales Representatives; or anyone who needs to select, specify, commission, install and/or maintain liquid piping systems and pipelines.

Delegate Pre-Requisites

It is a requirement that each delegate has an understanding of mechanical components. Experience with diploma or degree level engineering maths would also be advantageous.

Seminar Objectives

At the completion of this seminar, each delegate should be able to:

- Select the most appropriate material and pipe type for the application
- Determine the correct pipe schedule for an application
- Understand cavitation and water hammer
- Select the most appropriate valve type for an application
- Understand control valve sizing
- Read and generate drawings such as P&ID's and isometrics
- Be aware of the issues involved in designing pipe and pipe support systems
- Be aware of various fabrication, installation and maintenance issues.

Training Seminar Materials

All delegates receive:

- The **“Piping Systems” Training Manual** – a reference manual comprising theory, worked example problems, tables, charts and illustrations etc based on the seminar outline. This manual has been designed to be a valuable future resource for the office, workshop, factory or plant.
- **Certificate of Attendance** – which states the number of hours of training and serves as documentary proof of attendance.

Other Hydraulics & Pump Training

“Piping Systems” is the second seminar in a series of three pump and hydraulics training seminars. It provides a practical introduction to piping systems. It is not necessary to have previously attended one of these other seminars to benefit from “Piping Systems”.

Please contact KASA Redberg for more information on this series of seminars as well as others on offer.

Email: info@kasa.com.au

Public and In-House Training Venues

KASA regularly holds this and related seminars in high quality hotel conference facilities across Australia and the rest of world. Our seminars can also be presented at your place of work and can even be customised to suit your specific training needs.





Seminar Synopsis

DAY 1

BACKGROUND INFORMATION

Terms and Definitions
Pipe Manufacturing Methods
Fluid Properties
Basic Hydraulics Theory and Calculations
Friction Losses & Pipe Sizing
Cavitation and Water Hammer
Practical Tutorial

SELECTING PIPE & FITTINGS

Applicable Codes and Standards
Materials of Construction, Connection
Types – Screwed, Flanged, Sanitary etc
Gaskets and Jointing Materials
Fittings
Practical Tutorial

VALVES

A detailed Analysis of Common Valve Types –
(Ball, Butterfly, Globe, Gate, Pinch, Angle, Needle, Check,
Pressure Reducing, Solenoid, Vacuum/Pressure Break,
Pressure Relief, Diaphragm etc)
Materials of Construction
Valve Actuators
Valve Selection & Sizing Guidelines
Control Valve Selection and Sizing
Valve Maintenance and Troubleshooting
Practical Tutorial

INSTRUMENTS

Typical Instruments Found in Piping Systems
Selection Guidelines

DAY 2

DESIGN & DRAFTING

Piping Specifications
Drafting Symbols for Pipes, Valves, Fittings, Instruments etc
Process Flow Diagrams, Piping & Instrumentation Diagrams
Line Lists, Plot Plans, Layouts, Isometrics, Spool Drawings

GUIDELINES FOR THE LAYOUT OF PIPING

General Overview
Maintenance and Operating Requirements
Process Requirements
Safety Considerations

PIPE SUPPORT SYSTEMS

General Overview
Rigid, Variable and Spring Supports
Snubbers, Sway-Braces, Baseplates
Introduction to the Design of Pipe Supports

AN INTRODUCTION TO PIPING DESIGN LOADS

Sustained Loads – Weight and Pressure
Occasional Loads – Wind, Relief Valve and Seismic
Thermal Loads, Stresses and Movements
Basic Manual Calculation Methods
Practical Tutorial

MISCELLANEOUS TOPICS

Heat Tracing
Insulation
Filters & Strainers
Fabrication & Erection
Maintenance

About KASA Redberg

KASA Redberg is a technical training and engineering consulting group.

Our engineers have core competencies in pumping systems and fluid centric processes and equipment. Our portfolio of services includes:

- Tank and vessel design
- Pumping and piping systems design
- Chemicals plant design
- Water treatment plant design
- Project management
- On-site troubleshooting
- Plant cost analysis
- Feasibility studies
- Operator training seminars

AUSTRALIA

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UNITED KINGDOM

Office Opening in March 2007



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