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# Course: Hydrostatic Pressure Test According to ISO 9080 and ASTM D2837

Code	City	Hotel	Start	End	Price	Language - Hours
751	Muscat (Oman)	Hotel Meeting Room	2025-02-09	2025-02-13	3950 €	En - 25

## PROGRAMME SUMMARY: -

Pressure testing of newly manufactured and installed pipework and pressure vessels is an essential part of ensuring that assets meet their operational requirements. However, the number of reported failures indicate that current processes and available guidance relating to pressure testing are not adequate, both in the factory and on-site. Pressure Testing Procedures and Best Practice Training outlines the responsibilities in the Health and Safety Executives Guidance note GS4 “Safety Requirements for Pressure Testing” and how to meet those requirements. A review of case studies is conducted to demonstrate where ‘things go wrong’ and how to prevent such incidents in the future. A significant emphasis will be placed on the ‘Test Supervisors’ roles and responsibility and the safe systems of work that must be in place. The safe system of work provides written instructions to test engineers and requires sufficient information to ensure correct: Within the boiler, piping and pressure vessel industry, safety relief valves are of most essential importance. Pressure relief valves are the last line of defense against catastrophic failure or even loss of life. The course covers safety valve types, codes & standards and designs, materials, specification and selection, sizing, installation & testing, preventive maintenance procedures, operation and troubleshooting. A number of different instructional methods are used throughout the course to allow interactive learning and to give practical examples from the manufacturing and service industry to enable the delegates to operate select, size, install, test and troubleshoot safety valves upon course completion.

## OBJECTIVE:-



- Familiarize participants with the functions and applications of safety relief valves, their types, designs and components.
- Enable appropriate safety valve sizing and selection for liquid, gas and vapor applications
- Train participants to install, inspect, test & troubleshoot a variety of safety valves.
- To increase the participant's awareness and understanding that the mechanical integrity of relief valves depends jointly on the proper design, operation, condition assessment, and maintenance of the equipment.
- To provide the participants with a clear understanding of the degradation mechanisms that relief valves could be subjected to over their operating life, how to identify them, predict and determine their impact, and what appropriate measures can be taken to prevent and control the resultant damage.
- To provide the participants with the knowledge and failure analysis skills they need to conduct damage and failure analysis so as to prevent similar failures from happening.
- To understand requirements of industry codes/standards and approval authorities.
- In-situ Testing Techniques - Onsite Testing of Safety Relief Valves.
- Emerging Technologies in Pressure Relieving Devices
- Use Valve Star / PRV size software for Safety Relief Valve Sizing & selection from Leser and CROSBY..

## **WHO SHOULD ATTEND :-**

- Engineers / Supervisors / Technicians from Maintenance Operations Department .
- Maintenance Service Department and Inspection & Materials Technology Section.
- Chemical, Process, Petroleum Engineers
- Design Engineers
- Piping Engineers
- Plant Engineers
- Plant operators
- Mechanics
- Safety inspectors.



- For all oil and gas industries

## **CONTENT OF THE PROGRAM: -**

### **INTRODUCTION -SAFETY RELIEF VALVES:-**

- History
- Pressure Relief Devices ( ReClosing, Non- ReClosing)
- Reclosing Pressure Relief Devices
- Pressure Relief Valves
- Safety Valves
- Relief Valves
- Safety Relief Valve
- Non Reclosing Pressure Relief Devices
- Rupture Disk
- Breaking Pin devices
- Buckling Pin devices
- Shear Pin devices
- Fusible Plug devices

### **OVERPRESSURE PROTECTION:-**

- Safety Relief Valves in a Process
- Causes of Overpressure (Blocked Discharge, Fire Case, Thermal Expansion
- Runaway Reaction, Tube Rupture in Heat Exchangers)
- Overpressure Protection Requirements

### **PRESSURE RELIEF VALVES - WORKING PRINCIPLE & COMPONENTS &**

### **SPECIFICATION:-**

- Conventional Pressure Relief Valves



- Pilot Operated Pressure Relief Valves
- Balanced Bellow Pressure Relief Valves
- Power & Temperature Actuated Pressure Relief Valves
- Relief Vs Safety Valve
- Components & Accessories of Relief Valves
- Specifying Pressure Relief Valves

## **SAFETY VALVES - WORKING PRINCIPLE & COMPONENTS, SPECIFICATION**

- Working Principle
- Classification ( Actuation, Lift, Seat Design, lever, bonnet )
- Major Components / Accessories
- Locations
- Specifying Safety Valves

## **CODES & STANDARDS:-**

- Overview operational requirements
- ASME & API codes and standards-clarifications
- National Board approval
- Main paragraph excerpts from ASME VIII
- BS EN ISO 9080
- ASTM D2837.

## **DESIGN FUNDAMENTALS**

- Materials of Construction
- Direct spring-operated Safety Relief Valves
- Introduction
- Functionality
- General design
- Design of main assemblies
- Design differences



- Types of spring-operated SRV`s
- Controlled safety pressure relief system (CSPRS)
- Pilot Operated Safety Relief Valves

## **SIZING & SELECTION:-**

- Introduction
- Gas and vapor sizing
- Steam sizing (sonic flow)
- Liquid sizing
- Combination devices
- Two phases or flashing flow
- Two phase liquid/ vapor flow
- Two phase system with flashing or non-condensable gas
- Sub cooled liquid flashing
- Two phase system with flashing and non-condensable gas

## **SAFETY RELIEF VALVE SELECTION:-**

- Seat tightness
- Blowdown
- Service temperature
- Weight and/ or height
- Back pressure
- Orifice size - sizing
- Two phase flow
- Type of fluid
- Reciprocating compressors
- Liquid
- Materials

## **INSTALLATION:-**



- Inlet and outlet piping
- Calculating piping losses
- Calculating outlet piping
- Location of installed SRVs
- Reaction forces and bracing
- Temperature transmission on installed SRVs
- Installation guidelines

### **MAINTENANCE:-**

- Determining maintenance frequency and cost
- Transportation and dirt
- Preinstallation handling and testing of the pressure relief valve
- Maintenance procedure ( Pretest, Disassembly, Repair, Assembly & Testing)

### **TROUBLESHOOTING:-**

- Seat leakage
- Chatter
- Premature opening
- Valve will not open
- Valve open above set pressure
- Valve does not reclose
- Bellows failure
- Springs



**The Scandinavian Academy for Training and Development employs modern methods in training and skills development, enhancing the efficiency of human resource development. We follow these practices:**

- **Theoretical Lectures:**

- We deliver knowledge through advanced presentations such as PowerPoint and visual materials, including videos and short films.

- **Scientific Assessment:**

- We evaluate trainees skills before and after the course to ensure their progress.

- **Brainstorming and Interaction:**

- We encourage active participation through brainstorming sessions and applying concepts through role play.

- **Practical Cases:**

- We provide practical cases that align with the scientific content and the participants specific needs.

- **Examinations:**

- Tests are conducted at the end of the program to assess knowledge retention.

- **Educational Materials:**

- We provide both printed and digital scientific and practical materials to participants.

- **Attendance and Final Result Reports:**

- We prepare detailed attendance reports for participants and offer a comprehensive program evaluation.

- **Professionals and Experts:**

- The programs scientific content is prepared by the best professors and trainers in various fields.

- **Professional Completion Certificate:**

- Participants receive a professional completion certificate issued by the Scandinavian Academy for Training and Development in the Kingdom of Sweden, with the option for international authentication.

- **Program Timings:**

- Training programs are held from 10:00 AM to 2:00 PM and include coffee break sessions during lectures.