FACT SHEET (SELF-GUIDED)

Thickness, external pressure and buried pipeline calculation

Fundamental course Introduction to Flexibility Analysis and Support Design

Who Should Attend?

This course is intended for **graduates (or soon to be), designers, freelancers, technicians and engineers** involved in: calculation, design, selection, manufacturing, safety, quality and maintenance of systems and equipment in industrial processes.

Previous knowledge of this subject is not required to attend to the course.

Training Objectives

The main objective of this course is to **transfer to participants the theoretical and practical skills required in projects**, obtained from experience and sound engineering practices.

What to Expect?

Master the process of calculating thicknesses and selecting commercial thicknesses available in the market.

Get familiar with the calculation and design process for pipes subjected to external pressure (vacuum).

Understand the method of design and calculation of Buried Pipes, and in turn, identify the keys for a correct installation.

Course Duration

30 hs, to be completed in 21 days. The Virtual Campus will be open for 6 months (flexibility).

Methodology

Self-guided, Hands-On Course

Available 24/7, Self-paced course

“Learn by doing” concept

Non-scheduled sessions

Instructor available during the entire course

Included in the course

Study Notes

Summary Videos

Conceptual Questions

Case Studies based in real designs

Design & calculation sheets

Contents

Thickness Calculation

Stresses in cylindrical shells

Thin walled cylinders

Thickness calculation procedure

ASME B31.1 Formulae: Power Piping

ASME B31.3 Formulae: Process Piping

ASME B31.4 Formulae: Pipeline Transportation

ASME B31.8 Formulae: Gas Transport

Commercial thickness selection

Proposed Case Studies

- *Allowable stress selection*
- *Selection of pipe coefficients*
- *Thickness calculation*
- *Commercial thickness selection*

External Pressure Design

Applicable Codes

Failure Mechanisms

Moment of Inertia of the System

Support Lines

System verification

Wall thickness and Stiffening rings

Best Practices

Proposed Case Studies

- *Thickness verification against external pressure*
- *Distance between support lines*
- *Design of Stiffening Rings: Case Study*
- *Pipe + Rings Verification: Case Study*

Buried Piping Design

Introduction

Design Codes

Terrain Importance

Design Considerations

Loads Definition

Stress Verification

Failure Modes

Installation

Proposed Case Studies

- *Vertical Loads of the terrain*
- *Superficial Live Loads*
- *Ovalization and Induced Stress*
- *Stress due to flotation*

Instructor

Senior Mechanical Engineer and Master in Business Administration (MBA). **More than 20 years of experience in design, calculation and fabrication of pressure vessels, heat exchangers, storage tanks, piping systems and structures in general.**

Duties of the above-mentioned positions cover the entire cycle of an equipment, **from the very conception, drawings, design and calculation, technical specifications, technical requisitions, vendor drawings, to the manufacturing phase and installation assistance**. Among the developed projects, clients such as SHELL, EXXON, REPSOL, CHEVRON, GALP, CEPSA, TUPRAS and SAUDI ARAMCO can be found.

Vast experience providing specific training sessions in both classroom and online approaches. More than 75 training courses carried out in different institutions and in-company, courses oriented to graduates, designers, engineers and experienced professionals.

Tailored Training

The most effective training is one that satisfies the needs of each company's business focus and deliverables. **We adapt our training programs to each specific requirement, offering bespoke solutions for each need.** The result, 100% tailored programs, developed to maximize the time investment and deliver tangible and intangible returns to the work teams.

After assessment phase, a tailored training plan is designed jointly with the client. This plan is specifically tailored to meet the client's needs, focusing on effectively enhancing the capabilities of the work team. **We provide practical, dynamic and hands-on training,** making available the best instructors in each subject.

Arveng Training

Arveng Training has developed effective and practical courses for the needs of today's industrial challenges by delivering specific and high-quality engineering training courses utilizing all three approaches: classroom, on-line and tailored training. We are proud to have imparted more than 100 classroom courses, 200 online courses and over 15 in-company sessions. Our training activities has benefited over 1,500 professionals. Our greatest pride is in the letters of recommendation we receive from so many of our customers in this area.

We consider the time of our students as the most valuable. For this reason, all our courses have been designed with the main objective of quickly the professional skills of the participants, through our expert instructors in different disciplines. **We stimulate creativity, innovation and initiative to make the participants inquisitive to bring good engineering practices and lessons learned to the field that benefits their employers in the long term.**

Our Company

Arveng Training & Engineering SL is a leading company providing Training and Engineering services based in Madrid, Spain. Our mission and vision are to be a leading training and engineering services company. We are a team of highly motivated, talented high qualified professionals with more than 20 years of experience. Our main goal is to provide our clients, the best training and engineering services and to exceed their expectations in all their spheres of industrial activity, through our renowned services which are based on efficient, innovative, cost-effective and transparent principles.

Established in July 2010, mainly oriented to the industrial sector, from the very beginning Arveng has always worked with closeness, responsibility and commitment in the different areas of activity.