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Prota Structure/Orion Course Outline

Course Duration

5 days, 10am – 2pm

Training Objectives

What are the Goals?

By the end of this training course, participants will be able to:

- Be familiar with The "Steel Structure" design
- Understand the loads applied on the steel structure in oil, gas and petrochemical plant
- Know the modern technique on the risk based inspection for maintenance plan
- Be familiar with the pipe rack design
- Know the design of the steel structure on machines
- Identify the use of composite section in strength and repair
- Steel Fabricator
- Construction Engineers

Daily Agenda

Day One: Introduction

Competency Description: As an engineer, you need to know the main element of steel structure design.

Key behaviours

- Understand the steps of design for steel structure
- Understand the different steel structure system
- Understand the codes and standards

Topics to be covered

- Pre-assessment
- The case for steel use in construction
- Structure system
- The comparison between different structure system
- Select and define step in steel structure projects
- Available steel grades and sections.
- Codes of practice for design, evolution from allowable stress to LRFD and limit state design.
- The loads effect on the industrial structures
- Preparing SOR and BOD
- Codes and standards

Day Two: Steel Member Design

Competency Description: As an engineer, you need to know the design of the main element of the steel structure.

Key behaviours

- Understand the behaviour of steel members
- Understand the rule of thumb steel section design

Topics to be covered

- Selection of structural systems

- Rigidly connected frames
- Plane trusses
- Space trusses
- Design of tension members
- Design of compression members.
- Design of beams
- Design of beam-columns

Day Three: Connection Design

Competency Description: As a structural engineer, you need to know the ways of defining the loads on the steel structure in industrial commerce and to know the connection design.

Key behaviours

- Understand the loads calculation for pipe rack
- Understand the types of connection
- Understand the overview the differences between the NDE methods

Topics to be covered

- Applied load on the pipe rack
- Design of the crane track girder
- Design of steel deck under vibrating machine
- Bolted connection designs
- Example of bolted connections
- Welded connection designs
- Example of welded connection

Day Four: Steel Construction and Maintenance

Competency Description: As a structural engineer, you need to know the ways of soil investigation and architectural work inspection.

Key behaviours

- Understand the construction steps
- Understand the ways of QC for steel structure
- Understand the design of anchor bolts
- Using FRP in hot climate

Topics to be covered

- Fabrication and erection of steel connection
- New methods for connecting steel to concrete
- Wind bracing design
- Anchor bolt design
- Dynamic analysis calculation for steel skid
- Using FRP in Steel Structure
- Fabrication and erection of FRP

Day Five: Architectural Work Inspection Guidelines

Competency Description: As an engineer, you need to know the composite section design and the relation between sustainable design and integrity management system.

Key behaviours

- Understand the design of composite section
- Understand the IMS for steel structure
- Understand the overview about the sustainable structure

Topics to be covered

- Design of composite beams
- Design of composite columns
- Design of composite slabs
- Preparation of fabrication and erection shop-drawings
- Specifying structural steel
- Maintenance plan by risk based inspection technique