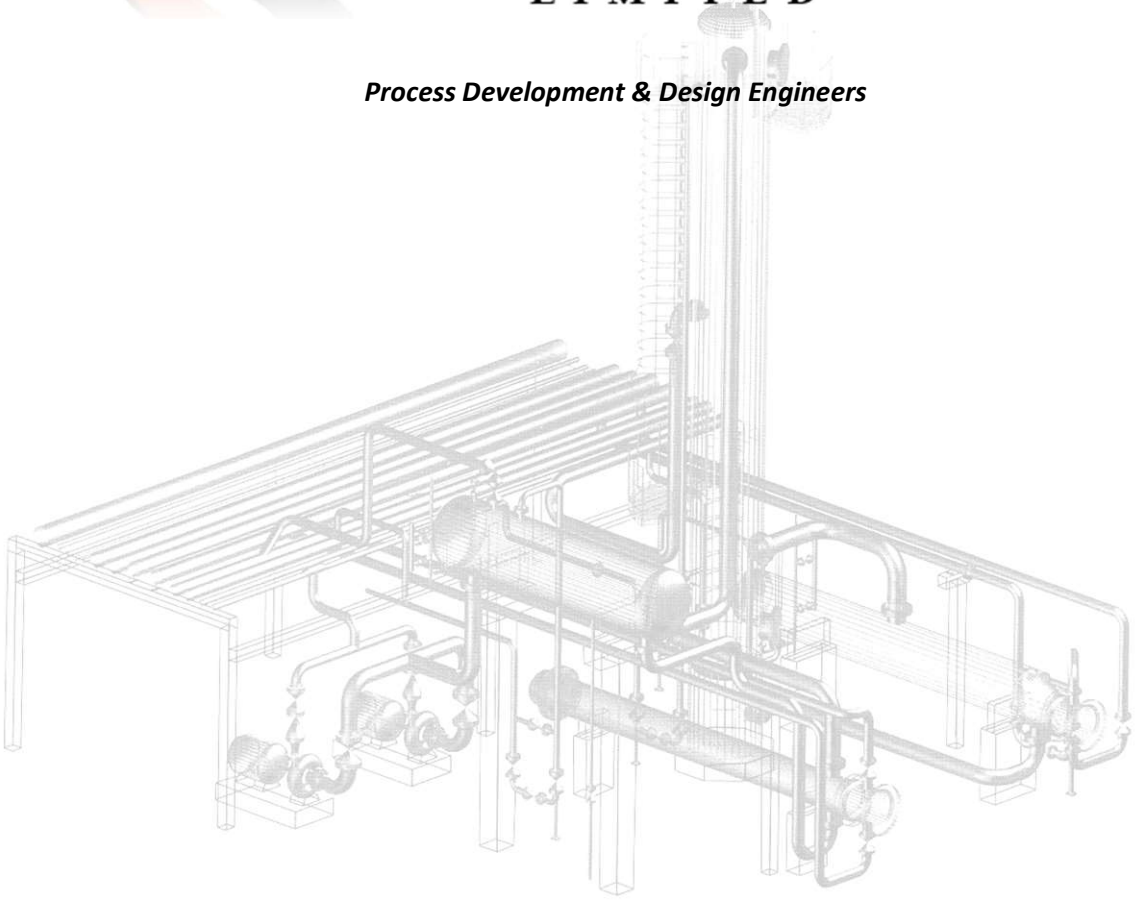
MAINPROPS LIMITED

Process Development & Design Engineers



Training Course Outlines

COMPANY PROFILE

ABOUT US

Mainprops Technology Limited is a Nigerian owned company, established with a vision to offer innovative engineering designs, proactive consultation & training services in Process Engineering, Process Piping Engineering & Design, Process Automation, Instrumentation and Control, Engineering Procurement and Project Management for the Process, Oil & Gas and Petrochemical Industries.

Our services cut across the fields of process and piping design, engineering, procurement, construction, operations and the maintenance of facilities onshore and offshore. We also provide Engineering Training and manpower development in Process Engineering, Piping Engineering, Instrumentation, Automation and Control.

RC No.: **1018175**
TIN: **12728539-0001**

VISION

To become a leading Provider of Piping Engineering Design and consulting services by keeping up with innovations in the progressively evolving Process, Oil & Gas and Petrochemical industries in Nigeria.

MISSION

To provide quality and dynamic engineering services and training to our valued clients. Quality to us means services engineered to meet each customer's peculiar need, performance according to specifications and a timely delivery of goods and services within the project specified budget. And by so doing become a global Engineering service provider in the Process, Oil & Gas and Petrochemical Industries.

To accomplish our mission, we utilize only proven engineering systems and innovative technologies to provide custom made solutions with our focus majorly on the customer's satisfaction.

OUR CORE VALUES

Our Values are **EPIC –** Paying close attention to

Excellence
Progressiveness
Integrity
Customer Satisfaction

STRATEGY

Our business strategy is focused on providing cutting-edge engineering services and client-based solutions. We strategically align with innovative technologies and rely on viable partnerships in order to deliver tailor-made solutions for the peculiar business needs of our valuable customers.

PIPE STRESS ANALYSIS & CAESAR II – ASME B31.3

Program Description

This course is aimed at exposing the participants to the calculations that address the stresses that piping systems are subjected to. It covers the types of loads on the systems and stresses caused by the loads, methods of resolving these stresses, layout solutions, flexibility analysis, support span calculations and the use of industry standard software for piping stress analysis.

COURSE OUTLINE

Introduction

- Objectives & Definition of Stress Analysis
- Critical Line List
- Information Required for Stress Analysis
- Piping Loads – Static & Dynamic
- Static & Dynamic Analysis
- Forces, Moment & Stress Calculations.
- Requirements of ASME B 31.3 Code – Sustained Loads, Thermal Expansion & Occasional Loads.
- Classification of Loads
- Solutions for Piping Loads.

Pipe Span Calculations

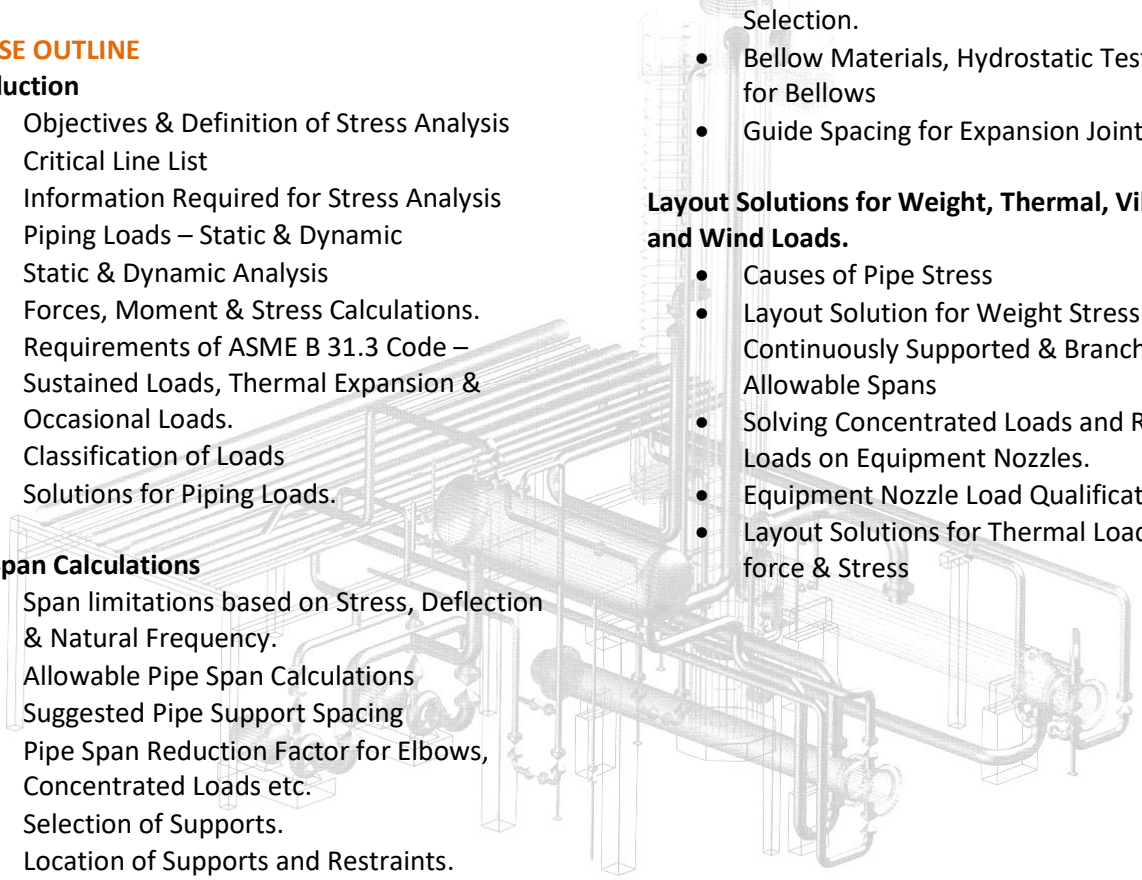
- Span limitations based on Stress, Deflection & Natural Frequency.
- Allowable Pipe Span Calculations
- Suggested Pipe Support Spacing
- Pipe Span Reduction Factor for Elbows, Concentrated Loads etc.
- Selection of Supports.
- Location of Supports and Restraints.

Flexibility Analysis – Expansion Loops & Expansion Joints

- Concept of Thermal Expansion.
- Providing Flexibility in Piping
- Minimum Leg Required to Absorb Thermal Expansion
- Types of Expansion Loops
- Expansion Loop Sizing for Hot Piping
- Expansion Joints – Types, Application & Selection.
- Bellow Materials, Hydrostatic Test Pressure for Bellows
- Guide Spacing for Expansion Joints.

Layout Solutions for Weight, Thermal, Vibration and Wind Loads.

- Causes of Pipe Stress
- Layout Solution for Weight Stress – Continuously Supported & Branch Pipe Allowable Spans
- Solving Concentrated Loads and Reducing Loads on Equipment Nozzles.
- Equipment Nozzle Load Qualifications.
- Layout Solutions for Thermal Load using force & Stress



CAESAR II – Pipe Stress Analysis Software

COURSE OUTLINE

- Introduction to CAESAR II
  Definitions, Work Space/Interphase, Tool bars, Menu options
- Piping Input Spreadsheet.

Modeling of Piping Isometrics

- Bends, Reducers, Tees, Valves, Flanges, and Loops etc.
- Modeling supports and restraints
- Performing Static Analysis
- Modifying Load Cases
- Hanger Selection
- Set up of Wind Load Cases.
- Set up of SUS, OPE, EXP, HYD, HGR, & OCC loads.
- Load Case Editor
- Viewing Reports
- Practical Examples – Input, Analysis & Redesign

What You Should Bring

Participants should bring a Laptop computer, a scientific calculator, sketch pad, pen and a note book.

N/B Laptops will be provided for those who do not have, it is however preferred that participants come with theirs as assignment on CAD software will require practice at home for perfection.

What You Will Learn

Calculations addressing Stresses (manually and using software) pertaining to piping systems in Chemical plant, Petroleum refinery, Gas Processing plant, Petrochemical, Pharmaceutical, Textile, Paper, Semiconductor & Cryogenic Plants in line with the requirements of ASME B 31.3

Who Should Attend

- Mechanical/ Chemical/Petroleum Engineers
- Technicians
- Draftsmen

Materials- *(Your Take Home)*

Training Manuals, Software (fully installed on your system), eBooks, Charts & Tables and we Guarantee Knowledge transfer.

Duration: Required minimum duration – 4 days full time

Course Fee: Contact us for an invoice

Training Features

- Instructor lead hands-on training
- Assessment quiz and certificate at completion.
- Conducive training environment
- Excellent Material will be Provided
- Industry Leading Software (CAESAR II) used in Training
- Individual Attention

We look forward to welcoming you on one of our training sessions….

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