Piping Design and Engineering

Huitt Co. Consulting

P O Box 31154, Des Peres, MO 63131

Organized and presented by the W. M. Huitt Co.

MODULE V
PIPING DESIGN FOR INDUSTRIAL FACILITIES

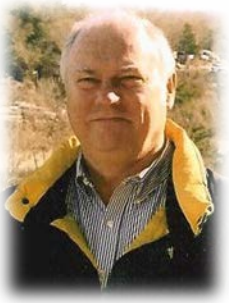
An Online Process Piping Design Course

Based, in part on the ASME B31.3 Process Piping Code

This is an online – on demand video course

There will be a 90 day access period from the time the course is purchased.

Course Instructor:



William M. (Bill) Huitt
Owner
W. M. Huitt Co.

54 years of active experience in the design, engineering, and construction of process piping systems across multiple chemical process industries.

Author of:

Several articles on Piping Design, Fabrication, Spec Writing, Fittings, Design for Hazardous Piping Service, and much more.
Book titled “Bioprocessing Piping and Equipment Design – A Companion Guide for the ASME BPE Standard”

Member of:

ASME B31.3 Section Committee
ASME B31.3 Subgroup on High Purity Piping
ASME BPE Subcommittee on Certification – Secretary
ASME BPE Subcommittee on Material Joining
ASME BPE Subcommittee on Metallic Materials
ASME Board on Conformity Assessment
BPE Certification – Vice Chair
ISPE Co-author of ISPE Water and Steam Systems – Baseline Guide Chapter 10 Rouge and Stainless Steel
API Co-author of API RP-2611

Testimonials

“Bill Huitt has long been the expert amongst experts when it comes to piping systems and their design.”
Earl Lamson Sr. Engineering Project Manager at Eli Lilly & Co.

“Bill has done a superb job in educating me [on] the details of reviewing 2-D drawings. He is an expert in piping design. “
Nasir Ahmed Principal Engineer at Amgen

“Bill has great insight in determining what is needed to make a piping project successful and then making it happen.”
Jeff Bradley Engineering Consultant at Eli Lilly and Company

“Bill is extremely knowledgeable in his field of piping and materials. He is a wonderful person to work with and I highly recommend him.”
John Calvert Sr. Process Engineer, Independent Consultant

“Bill is well-organized in all of his activities and consistently exceeds expectations.”
Ken Kimbrel Vice President at Ultraclean Electropolish, Inc.

DISCLAIMER

W. M. Huitt is an independent training instructor. The interpretation of any codes, standards, or regulations within this course is that of W. M. Huitt and not that of ASME.

As a result of attending this course, attendees will learn:
The purpose and intent of piping design
The basic elements of ASME B31.3
How to interpret the piping Code
How to determine the flange rating for a piping system
How to select material for a piping system
Specifications necessary for a project
And so much more, as described in the syllabus

This training course has been thoroughly researched and carefully structured to provide practical and exclusive training applicable to all attendees.
Benefits include:
- Thorough and customized programs to address current market concerns
- Illustrations of real life case studies
- Comprehensive course documentation
- On demand study

Course Overview

This 10 plus hour course will provide the piping designer and engineer with the broad, but specific information they need to perform their job more efficiently and effectively. It will provide a better understanding of regulatory compliance, system ratings, and leak testing requirements. The attendee will gain information they need in order to better understand pipe specifications, the piping design process, and its various elements in the preparation and execution of a project.

These 10 plus hours will be delivered in three Sessions. Each Session will be divided further into subject matter Parts. Providing somewhat convenient increments for a momentary pause or a lengthy break.

Session 1 sets the stage by introducing the student to the history of codes and standards, how to interpret codes and learn how they are developed to avoid conflicting rules.

Session 2 steps through the ASME B31.3 Process Piping code Chapter by Chapter explaining key points of each Chapter. It then touches on code boundaries and project planning.

Session 3 pulls it all together to step the student through developing pipe material specifications, flange ratings, various design elements, welding, fabrication, examination, inspection, testing, installation, leak test, and turnover documentation.

Who Should Attend

This course is useful to the CAD operator with very little experience in piping design to the experienced piping designer who needs to gain more knowledge with Code application and specification development. This course benefits plant maintenance personnel who work on piping systems, and is also of benefit to mechanical, process, and utility engineers who need to gain more detailed knowledge with the various aspects of piping component selection and piping system design.

Why You Should Attend

This course is based in large part on requirements of the ASME B31.3 Process Piping Code. But having said that, the course goes beyond the relevance of the piping code requirements to discuss and explain the design and engineering requirements not covered in the code. The code, as is stated in its introduction, "…is not a design guide." While the code is very explicit in providing rules for designing, constructing, and testing safe piping systems it does not explain or elaborate on how such systems should be designed, fabricated, or installed. This 10 plus hour course will show you how to comply with both regulation and pragmatic design. This course also drives home the fact that chemical processing facilities are inherently dangerous operating facilities. Throughout the discussion it instills the fact that the design and engineering process should do its utmost in providing, above all, safe operating facilities.

Course Syllabus (PDH's = 10)

Each of the three Sessions will begin with the unfolding of a real life industrial accident. Following the telling of each catastrophic event will be an analysis as to what might have been done to prevent the accident from happening.
At the end of each Session there will be an exam that will be filled out by the student and submitted to help them determine if subject matter may have been overlooked. If so, there should be ample time review that part of the course.

Session 1
Understanding Codes & Standards

PART 1 – Preventable Accidents
PART 2 – History and Purpose of Industry Codes
PART 3 – Industry Codes & Standards
PART 4 – American National Standards
PART 5 – ANS Developers
PART 6 – Subtle but Meaningful Words
PART 7 – What's In a Definition
PART 8 – Manual Valves
PART 9 – Pipe & Fittings
PART 10 – Insulation

Session 2
ASME B31.3 Chapter by Chapter/Applying Multiple Codes

PART 1 – Preventable Accidents
PART 2 – ASME B31.3 an Introduction
PART 3 – ASME B31.3 Chapter by Chapter
- Chapter I Scope and Definitions
- Chapter II Pressure Design of Piping Components
- Chapter III Materials
- Chapter IV Standards for Piping Components
- Chapter V Fabrication Assembly, and Erection
- Chapter VI Inspection, Examination, and Testing
- Chapter VII Nonmetallic Piping and Piping Lined with Nonmetals
- Chapter VIII Piping for Category M Fluid Service
- Chapter IX High Pressure Piping
- Chapter X High Purity Piping
- Appendices

PART 4 – Actual Incidents – Presented and Explained
PART 5 – Sample Problems and Their Solutions
PART 6 – Codes and Boundaries
PART 7 – Planning Ahead

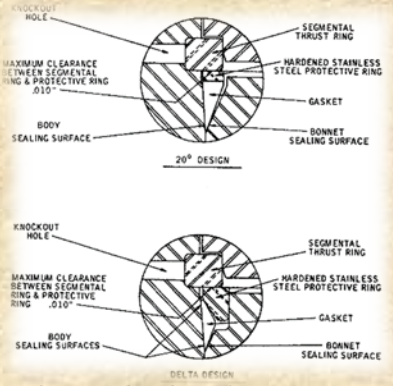
Session 3
From Piping Specifications to Turnover

PART 1 – Preventable Accidents
PART 2 – Developing Piping Specifications
PART 3 – Valve Selection
PART 4 – Pipe Flange Classification
PART 5 – Piping Design Elements
PART 6 – Sloping Pipelines
PART 7 – Fabrication of Metallic Pipe
PART 8 – Welding
PART 9 – Examination – Inspection – Testing
PART 10 – Pipe Installation
PART 11 – Leak Testing
PART 12 – Turnover Documentation
PART 13 – The Final Pre-Step

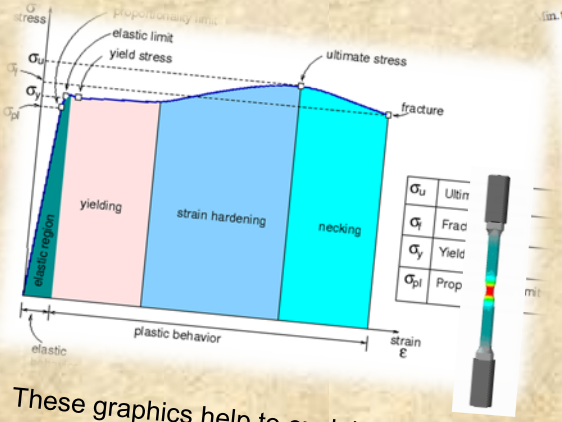
EXAMPLES OF CONTENT THAT APPEARS IN THE COURSE

Discussion will be held on a catastrophic event caused by a propane line that was abandoned in place a decade earlier. What was the cause?

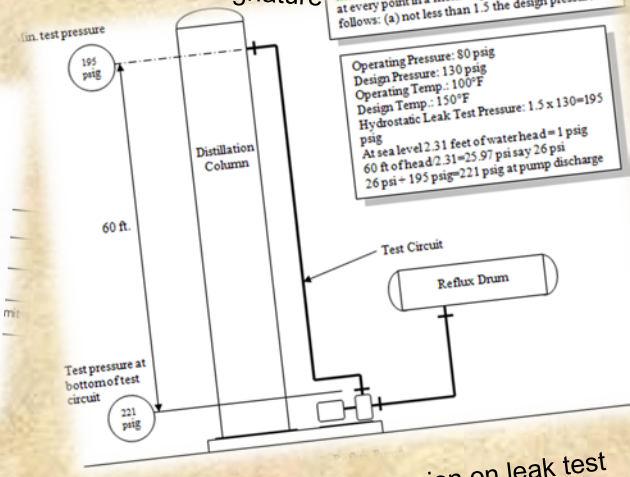
When referring to a heat of material this is what is being referred to. Each batch of steel, like the one shown here, carries its own individual chemical signature



The mechanics of a "Pressure Seal" valve are discussed

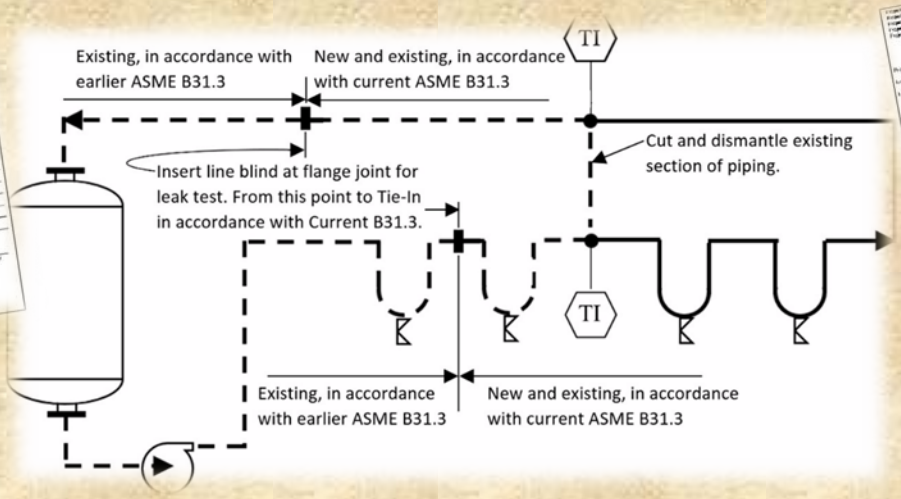


These graphics help to explain some of the aspects of strengths of materials.



This graphic is part of a discussion on leak test pressures. How they are determined and applied.

Hydrostatic Leak Test Form



Pneumatic Leak Test Form

One of the graphics used in explaining the code rules, both implied and stated, that apply to existing piping when performing modifications or making Tie-Ins.

Online access to the course will be made available to the student for a 90 day period. Extending the learning period beyond that diminishes the learning experience. However, if an extended period is needed for unexpected circumstances it can be provided.

COURSE INSTRUCTOR

W. M. (Bill) Huitt has been involved in industrial piping design, engineering and construction since 1965. Positions have included design engineer, piping design instructor, project engineer, project supervisor, piping department supervisor, engineering manager, and president of W. M. Huitt Co. a piping consulting firm founded in 1987. His experience covers both the engineering and construction fields and crosses industry lines to include petroleum refining, chemical, petrochemical, pharmaceutical, bioprocessing, pulp & paper, nuclear power, biofuel, and coal gasification. He has written numerous specifications, guidelines, papers, and magazine articles on the topic of piping design and engineering. Bill is a past member of ISPE (International Society of Pharmaceutical Engineers) where he was a member of the Task Group on ISPE Water and Steam Systems – Baseline Guide Chapter 10 Rouge and Stainless Steel and CSI (Construction Specifications Institute). He is a current member of ASME (American Society of Mechanical Engineers). He is a member of the B31.3 Section Committee and Subgroup H on High Purity Piping, a member of three ASME-BPE subcommittees and several Task Groups, ASME Board on Conformity Assessment for BPE Certification where he serves as Vice Chair, a member of the API (American Petroleum Institute) Task Group for RP-2611, he serves additionally on two corporate specification review boards, and was on the Advisory Board for ChemInnovations 2010 and 2011 a multi-industry Conference & Exposition.

Memberships Held:

ASME Board on Conformity Assessment BPE Certification – Past Vice Chair
ASME B31.3 Section Committee
ASME B31.3 Subgroup H on High Purity Piping – Chair
ASME BPE Subcommittee MM on Metallic Materials
ASME BPE Subcommittee MJ on Material Joining
ASME BPE Subcommittee CR on Certification – Vice Chair
ASME BPE Subcommittee GR on General Requirements
ISPE Co-author of Baseline Guide on Chapter 10 Rouge and Stainless Steel
CSI
API Co-author of RP-2611 Terminal Piping Inspection

(Note: ASME (American Society of Mechanical Engineers), ISPE (International Society of Pharmaceutical Engineers), CSI (Construction Specification Institute), and API (American Petroleum Institute)

Listing of a Few Clients:

Monsanto Chemical Company
Abengoa Bioenergy
Eli Lilly and Company
MBI Biotechnology Research
TSSA (Technical Standards & Safety Authority) Ontario
UNI Malaysia
Mindtribe Engineering
Abbott Labs
BASF
Leak Tight Analysis
Petrojam, Ltd. (Jamaican Petroleum)
SNC Lavalin
Heavy Oil Solutions
Proton Online (Now NEL Hydrogen)

PRICING FOR THE 10 PLUS HOUR COURSE:

1 to 4 students: $1800.00 each
5 to 9 students: $1700.00 each
10 to 14 students: $1600.00 each
15 or more students: $1500.00 each
Register by going to:
http://www.wmhuittco.com/onlinepipingcourses/registratio.html

ABOUT THIS COURSE:

The 10 plus hours of this online course contains the same essential information as you would get from a 3-day classroom course. When you remove the break times, lunch times, study times and lengthy face to face discussion time, a 3-day classroom course boils down to 10.5 hours of instruction.