Versa-Tech Training
Engineering, Consulting, Expert Witness

Basic Pipe Fitting

Two Day to Four Day Course Type: Lecture/Lab (Hands-On)

Day One

I. Introductions

a. Attendees and Instructor introductions

b. Purpose of training - to provide the maintenance mechanic the information to safely complete the repair procedures on fuel gas, steam, condensate, stock, air, hydraulic, fire, city and mill water piping systems.

c. Provide an outline of goals to be accomplished during the training session

d. Complete a retest to establish a level of knowledge (to be given to the instructor)

e. General discussion of the Plant systems - what are they and purposes

II. Safety

a. Provide an overview of basic safety requirements in accordance with Company policy and OSHA Requirements (During this time show a comedy safety film ... talks about company policy and introduce some applicable codes)

III. Introduction to threading pipe

a. List of the tools required. (We will show a couple of films on the proper use of threading tools)

b. Discussion of the type of pipe to use

1. **Application (steam, water, etc.) for the types of pipe**
2. **Code requirements for application. listing changes in various codes vs. the old way**
3. **Proper threading compounds and the proper procedure for use**

IV. "Hands-On Section

a. Demo on the proper use of the tools - part of this to be completed by the students. We will also restate the safety considerations during this procedure

b. Break into groups of 2. Then we will fabricate pipe projects as per the drawings furnished by the instructor. These projects will be tested for leakage (using either air or water)

Day Two

I. Plumbing Fixtures

a. Discussion of the types of fixtures uses and repair issues

1. Faucets - types and special tools
2. Flush devices - manual and auto
3. Urinals
4. Toilets

I. Manual Valves

a. Discussion of manual valves - types encountered, where to use, when to replace, how rated, how to install, how to repair. We will discuss both threaded and flanged.

1. gate
2. globe
3. ball
4. lubricated plug cock
5. needle

III. Flanges

a. Discussion of types and sizes of flanges

b. Materials used and applications

c. Methods of Preparation

d. Types of gaskets

1. where and what to use
2. surface preparation
3. how to install
4. how to replace
5. how and when to cut gaskets

e. Bolts and fasteners

1. picking the proper size and type for the application

IV. "Hands On" Section

a. fabricate project using cutting, threading and flanges - include installing valves with proper gaskets

b. repairing valves and testing

c. cutting gaskets from stock

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Day Three

I. Steam Systems

a. A discussion of boiler and steam piping codes and practical application (several stories of death and destruction)

b. Thermodynamics and the steam cycle - what is a BTU and how is it dangerous

c. Steam system and the equipment it operates

d. Steam traps -

1. application
2. testing
3. repair

e. Pressure and temperature control stations

1. application
2. testing
3. repair

II. Fire Protection Systems

a. A discussion of emergency repair and procedure with fire protection systems

b. use of Grinnell fittings

(There will be 3 video tapes shown this morning)

III. "Hands On" Section

a. Plant tour using infrared testing equipment for the testing of steam traps and reducing stations

b. Steam trap repair - disassemble, inspect and install new parts

c. Repair temperature and pressure control stations. Disassemble on the bench and reassemble.

d. Installation of repair of Grinnell fittings

Day Four

I. Tubing - application and practices

a. Uses and application of tubing

1. instrument air systems
2. plumbing
3. hydraulic

b. Types of tubing

1. application
2. pressure rating
3. temperature rating

c. Fabrication procedures

1. bending
2. compression fittings
3. flared fittings
4. chemical bonding

II. Hoses

a. Uses of

1. hydraulic
2. water
3. steam

b. Fabrication procedures

1. fittings - proper use and tools
2. assembly and disassembly (including safety precautions)

III. "Hands On" Section

a. Fabricate project from drawing that has copper sweat fittings, dielectric fittings, flexible hose connections and PVC pipe

b. fabricate drain piping using PVC drain piping material

c. evaluation of test