



Field Pressure Testing

TRAINING METHODOLOGY

This interactive training workshop includes the following training methodologies :

- ◆ Lectures
- ◆ Video
- ◆ Discussion of case histories and hands on calculations

While a generic approach will be followed specific reference to pertinent sections of AS2885 will be made throughout

WHO SHOULD ATTEND

The course is intended for engineers, maintenance technicians and inspectors responsible for the integrity, inspection, maintenance and repair of pipelines and piping systems. The fitness-for-service and integrity techniques are based on quantitative analysis, please bring a calculator.

TO REGISTER CALL NOW!

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COURSE INTRODUCTION

- A brief History of hydrotesting
- Comparison of Code requirements in various jurisdictions for Hydrotesting
- The Purposes of Hydrotesting – Strength and Leak tightness
- Some Side benefits of Hydrotesting - warm prestressing etc.
- AS 2885 .5 Field Test Pressure requirements
- Safety Considerations during testing – Hazard Assessment
- The choice of working fluids permitted by the Standard
- When Pneumatic Testing is advantageous
- Issues with Pneumatic Testing , establishing duration times for leak tightness equivalency



Field Pressure Testing

Test Header Design

- Safety in Pressure Testing
- Methods of Energy release for various test fluids and safeguards necessary for end cap (test head design)
- Requirement for test Head design to be compliant with Section 1 of AS 2885
- Conditions for Waiver of formal design requirement
- Materials selection for test headers
- Name plate requirements when intended for re use
- Design loads and temperatures to be considered
- NDT and Quality Assurance of Welding
- Need for separate proof testing of headers at pressure exceeding maximum line test pressure prior to use
- Location of test equipment and creation of exclusion zone
- Determination of wall thickness
- Combined stress considerations of bending and hoop stresses.
- Determination of the effect, if any, of saddle supports.
- Allowable stresses for listed materials
- Consideration of Branch connections ,nozzles etc.

Test Section

- Designing for the test
- Determination of the suitable test pressures in accordance with the type of test (Type 1 , 2 or 3)
- Checking the suitability of flanges and appurtenances to withstand the test pressure in the section
- Determining the length of the test section
- Preparing for the test -Test Plan
 - Sourcing the Working fluid
 - Environmental considerations during pumping and filling
 - Permitting for water acquisition and disposal
 - Use of Biocides
 - Filling and Dewatering
 - Accessing the line,
 - Contingency planning in the event of a rupture
 - Test equipment and Its installation
 - Provision of pressure relief valves
- The use of the P –V method of monitoring the test
 - Determining the test volumes , squeeze volumes ,effects of temperature air entrainment
 - Worked examples



Field Pressure Testing

Basis of Strength Test

- Establishing the adequacy, or strength of the pipe for its defined purpose
- The value of mill testing
- Types 1,2 and 3 tests
- Determining test pressure factors
- Test hold periods and significance, or otherwise, of small leaks on the test outcome
- Adding small stroke volumes to maintain pressure
- The value of high level testing
- Pressurising ,thermal stabilising , testing
- Establishing the end point
- In service testing to remove critical defects

Strength Test Analysis

- For type 3 strain limited tests determine the amount of plastic strain in each test section and its location
- Verify that coatings are not damaged as a consequence of plastic straining of the pipe section
- Re -Assess section test lengths to ensure excessive plastic straining does not occur
- Consider the likelihood of bulging of the test section

Leak Test Analysis

- Leak test requirements
- Pressure levels , hold times for Leak teting
- Acceptable Leak detection methods
- The seven categories of Leaks
- Dealing with Measurement Uncertainty
- Criteria for leak acceptance
- Above and below ground pipe testing
- Combined Leak and strength tests

Calculations

- Hands on Practice in preparing and making sundry test calculations for a number of test sections.
- Stored energy, effects of air entrainment ,effects of temperature change on Volumes etc;
- As per Appendices” C” and “D” of AS 2885.5

Compiling Test Results

- The need for records retention (consequence of poor records retention the expensive PG&E retest program in California)
- Test Reporting requirements for compliance
- Dates and results of tests and witness sign off
- Relevant test certificates, equipment validation
- Mill test pressures etc.
- Test fluid medium