

# HOT-TAPPING OF PIPELINES PRACTICES & PROCEDURES



**Why:** Performing welding operations onto operating pipelines for maintenance purposes or to attach branch connections is very dangerous. These operations require proper procedures, welder qualifications, and must address safety issues successfully. Published documentation and recommended practices and procedures regarding in-service welding, commonly referred to as hot-tapping or hot-tap welding, are continually being updated and pipeline engineers are constantly faced with problem solving in this arena. This course describes the concerns, design, implementation, inspection, and testing of in-service welds.

In addition to the lecture portion of the training course, this course is designed to enable participants to successfully run Hot Tap® weld cooling rate prediction software and interpret the results. The software is designed to support the development and/or selection of qualified in-service welding procedures intended for use on operating pipelines. The PRCI Hot Tap® software is applicable to pipelines that contain a variety of different pressurized gases or liquids. The first portion of the course provides participants with a clear understanding of the factors that contribute to burnthrough or cracking and serves as the foundation for understanding how Hot Tap® can be used as a significant component of a company's welding technology program. The second part of the course teaches participants the details of how to use and interpret the results of the program. In addition, participants will learn the highlights of various technical resources that supplement the Hot Tap® program to provide a more comprehensive body of technical information pertaining to welding onto operating pipelines.

This course will address in-service welding onto gas and liquid pipelines under both typical and non-typical conditions, with particular emphasis on regulation/compliance review, recommended practices and case studies. The course will also cover current research done by Edison Welding Institute (EWI), GTI (formerly GRI), the Pipeline Research Council International, Inc. (PRCI) and other organizations. The Hot Tap – Practices & Procedures Course is structured for all pipeline personnel and provides an understanding of the theory and practices regarding in-service welding but most importantly how to solve non typical in-service welding problems under various conditions.

## Documentation & Course Materials:

All delegates will receive a detailed set of lecture notes, providing an invaluable reference document. In addition a CD with the lecture notes and an evaluation version of the PRCI Hot Tap Cooling Rate® model software will be included.

## Who Should Attend:

- Welders
- Engineers, technicians, and service professionals involved with construction, maintenance, inspection, and repair of liquids, gas, and products pipelines.
- Project managers with oversight for third party engineering or maintenance.
- Project and facility managers concerned with system integrity and maintenance.

**Where:** 11 Dividend Street  
Mansfield Q 4122  
Australia  
9k from the centre of Brisbane

**When:** One and a half day training course  
September 13 - 8:15 A.M. - 5:00 P.M.  
September 14 - 8:15 A.M.-12:00 P.M.

**Price:** \$2,100.00AUD per person

## Instructor:

Matt Boring, P.E.  
Senior Engineer  
Arc Welding Team – Pipeline Specialist

Mr. Boring works as a Senior Engineer at the Edison Welding Institute in the area of pipeline welding including in-service welding. He is a member of the API 1104 Subcommittee on In-service Welding as well as a member of the ASME Post-Construction Subcommittee on Repair and Testing.

## Hot Tap of Pipelines - Practices & Procedures Training Course Agenda/Outline

### Day 1, Start: 8:15AM

1. Introduction
2. Burnthrough
  - 2.1. Factors influencing burnthrough
  - 2.2. Determining burnthrough risk
  - 2.3. Recent research

### Break

3. Hydrogen cracking
  - 3.1. Failures attributed hydrogen cracking
  - 3.2. Factors influencing hydrogen cracking
  - 3.3. Hydrogen cracking mitigation



Lunch ~11:30

- 4. In-service welding applications
  - 4.1 Full-encirclement repair sleeves
  - 4.2 Hot-tap branch connections
  - 4.3 Weld metal deposition

Break

- 5. Quality control
  - 5.1 Pre-weld inspection
  - 5.2 Heat input monitoring
  - 5.3 Non-destructive testing methods
  - 5.4 Confirmation coupons
- 6. What the applicable codes and standards say about in-service welding
  - 6.1 API 1104 Appendix B
  - 6.2 ASME B31.4 and B31.8
  - 6.3 ASME PCC-2
  - 6.4 CSA Z662

End of Day 1

### Day 2, Start: 8:15AM

- 7. Developing an in-service welding program
    - 7.1. Procedure options
    - 7.2. Procedure selection guidelines
  - 8. Practical aspects of in-service welding
    - 8.1. Concern mitigation
    - 8.2. Welder and procedure qualification
    - 8.3. Field guidance
    - 8.4. Other in-service welding concerns
- Break
- 9. Lessons to be learned from past in-service welding incidents and general rules of thumb
    - 9.1. Reported incidents
    - 9.2. Previously unreported incidents
    - 9.3. Five general rules of thumb
  - 10. The Role of Hot Tap® in developing and selecting welding procedures for use on pressurized pipes
    - 10.1. Setting the starting point for qualification of new procedures
    - 10.2. Interpolating between qualified procedures
    - 10.3. Doing "what-if" scenarios and sensitivity analyses

Lunch

- 11. Running the Hot Tap® software
  - 11.1. Operating the Hot Tap® model
  - 11.2. Interpreting the Hot Tap® software results
  - 11.3. Case studies
  - 11.4. Sources of error and conservatism
  - 11.5. Hot Tap® software version 5.0 introduction

END Scheduled for 12:00 P.M.

The schedule is subject to change.  
It is encouraged for the class participants to bring in-service welding applications specific to their company.



**Please complete the attached form  
and fax to TTI at 713-630-0560**

**Course Cost: \$2100AUD per student**

**Course Date: September 13 & 14, 2010**

**Name** \_\_\_\_\_

**Company** \_\_\_\_\_

**Address** \_\_\_\_\_

**Address** \_\_\_\_\_

**City, State, ZIP** \_\_\_\_\_

**Country** \_\_\_\_\_

**Phone/Mobile** \_\_\_\_\_

**Fax** \_\_\_\_\_

**E-mail** \_\_\_\_\_

**Payment by Credit Card**

**Circle One: VISA MasterCard AMEX**

**CC Number** \_\_\_\_\_

**Expiration Date** \_\_\_\_\_

**Signature\*** \_\_\_\_\_

**\* By signing above I commit to paying the course fee when invoiced**

**Terms and Conditions:** Terms and conditions: One registration is required per person. Upon receipt of your above registration, an invoice will be generated for payment. Payment is due 30 days from receipt of invoice. Due to the nature of this training abroad Technical Toolboxes cannot issue refunds on registrations for the Hot Tap class in Australia. You may however substitute personnel.

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