

**NWIS TRAINING, INC.**

**16380 Hwy 290 W**

**Burton, Texas 77835**

**(979) 289-9000**

**[www.NationalWelding.com](http://www.NationalWelding.com)**

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## **HISTORY**

The motivation and the beginning for this welding inspection training program goes back to John's days as the Sr. Welding Engineer for the Trans-Alaska pipeline and his daily responsibility to assess the quality of welding on the 800 mile pipeline. He was constantly traveling to each of the seven pipeline spreads working simultaneously to complete the project. Approximately 400 welding inspectors were involved in this huge effort monitoring the welding on each spread from the pipe gang to the firing line to repairs and tie-ins. The majorities of the inspectors had excellent backgrounds and were making the right calls regarding weld quality. However, some of the inspection calls indicated a few of the inspectors did not have a complete understanding of the construction specifications and national codes used on the project. Some of the calls made were, in fact, not helpful to the inspection program. One such example occurred when John was on Spread One and he opened an electrode holding oven on the Right-of-Way. Water poured out of the bottom of the oven which was supposed to hold the low hydrogen electrodes only, (in this case E8018-C3), for welding the vertical support members (VSM'S) which support the above ground portion of the pipeline. When the foreman was questioned about this situation, his response was, "Don't blame me John, it was your inspector that told me to put all electrodes in the oven, cellulosic and low hydrogen electrodes." The foreman was told by his construction project superintendent to follow the welding inspector's direction and did so against his better judgment.

Obviously, the inspector misread John's telex of instructions for proper LH electrode storage or simply did not know the difference between cellulosic and low hydrogen electrodes. This is one example of many which John encountered during his on-site inspection visits to each spread during the two-year construction project. The net result of these occurrences was that John felt that if he ever left the safety of ARCO/Alyeska employment he would like to start a school for training welding inspectors on the codes and standards and what are the acceptable welding practices which would assure quality welding. As the project continued for two years, John found many other examples which were not helpful and even required unnecessary work such as cutting out a weld due simply to "weld spatter" not because of an actual "arc-burn". The welding foremen throughout the project would contact John when they felt some inspector "calls" or directives were uncalled for. Not all, but some of the foremen

concerns were legitimate and needed correction. This was very unfortunate and would not have happened with proper inspector training. In the “arc-burn” issue, the inspector later admitted he had never seen an actual “arc-burn” and thought the spatter was in fact, the actual “arc-burn”. These findings, mis-calls and issues were resolved on the ROW and John never brought these to anyone’s attention back in the Anchorage office. They bothered him but he considered the issues closed and resolved although he did not forget them.

When John was asked to move to the ARCO Refinery Division in Los Angeles after five years total on the Alyeska project, and with the project complete, the above occurrences’ were motivating factors which led him to start the welding inspection training school and his consulting services business.

After leaving ARCO in 1977 John started the National Welding Inspection School and the Welding Inspector Training Program. John began teaching all of the codes and standards pertaining to pipeline construction and added his experiences on the Alyeska Pipeline.

As the number of attendees continued to grow over the 34 years and as the number of companies accepting this program and its technical contents grew, it was suggested by the attending companies that the “Certificate of Attendance” be changed to “Certificate of Pipeline Welding Inspector” to meet the needs for assuring “qualified” personnel be used for monitoring their pipeline welding construction activity. Many companies have elected to use this program to meet the DOT requirements for trained and qualified personnel.

Because of the specific pipeline training program curriculum, the experience of the instructor, the longevity of the program through the years, many companies have accepted this program as a reliable and credible means to train their inspectors for assuring the quality of welding on their own pipeline welding activity.

Because of the company requests, the “CPWI” certificate was born. The acceptance of this certificate and program is a company option. Most of the major companies, after reviewing the curriculum, the experience of the instructor, and the fact that the school conducts training for the DOT state and federal inspectors, consider this program an acceptable means for the training of their inspectors for “Pipeline Welding Inspection”.

Today, NWIS Training, Inc. is recognized by many of the major oil and gas companies throughout the country for providing the training of their individuals as a pipeline welding inspector “CPWI”.

Again, the recognition of this certificate course is a company option and the school and its staff will continue to work extremely hard to merit their acceptance of this course for preparing their individuals for pipeline welding inspection activity. Adding experienced pipeline staff personnel and building a completely new facility for “Hands-On” training, in addition to the formal classroom training, is planned for 2013. NWIS Training, Inc. will strive to continue to be the best school for “Pipeline Welding Inspectors”.

## **APPROVALS**

NWIS Training, Inc.: Approved and Regulated by the Texas Workforce Commission, Career Schools and Colleges, Austin, Texas.

## **FACILITIES AND EQUIPMENT**

NWIS Training, Inc. facility was completed and opened the doors in the beginning of 2013. This 15,000 + square foot facility features a state of the art classroom with 3 projector screens, 5 flat screen TVs, surround sound, live video streaming for live TV presentations and various other capabilities. Our classroom is large enough to seat 115 students per class. The shop area is equipped to provide hands on demonstrations such as locating weld defects, tensile testing, amps and volt measurements, measuring ultrasonic thickness, film interpretation, dent measurement, measuring the magnetic field with the Gaussmeter and measuring diameter of pipe ends. Several Miller Electric welding machines are set up to provide demonstrations and hands on experience of various welding techniques. Our facility has a Metallurgical Lab equipped with the latest microscopes and etching equipment used in weld procedures and welder qualifications. Also located near the building is a 16" O.D. 400' pipeline used for identifying weld defects. A 10x20x8 concrete burst chamber equipped with live feed cameras is used to demonstrate the yield strength of different pipe wall thicknesses and defects under pressure. Also available are two 6" O.D. buried pipelines used for Hydrostatic Testing and demonstrating the use of pigs. This facility really is one of a kind, from the classroom to the rustic decor. Mr. Wormeli took great pride in designing a "Top Gun Facility" where people could feel at home while gaining the knowledge needed to enhance their future in the Oil & Gas Industry.

**OFFICERS of NWIS Training, Inc.:**

**Shan Conway.....President/Owner**

**Dwight Conway..... Vice President/Owner**

Shan and Dwight Conway have over 60 years combined experience in the oil and gas industry and carry degrees from South Plains College. After several years of field experience with several different service companies, the 2 brothers started Flo-Tech Testing, Inc. in 1997 acting officers of President and Vice President. In 2011 they sold their company consisting of 6 offices and 175 employees to Schlumberger Technologies. Shan resumed a roll of North American Manager and Dwight resumed the roll of North American Safety Director for Schlumberger until 2015. They helped set the new standards of Well Testing Safety for Schlumberger throughout North America during their tenure at Schlumberger. In June of 2015 Shan and Dwight purchased National Welding Inspection School where they have been working hand and hand daily with the instructors and employees on setting the highest standard of pipeline practices in the industry.

## **KEY STAFF**

### **Leslie N. Wittu.....Director**

Leslie Wittu received a Bachelor’s Degree in Business Administration with a major in accounting from Sam Houston State University. She worked as a business consultant for several companies and worked with John Wormeli as a third party consultant and accountant before coming on board full time to help Mr. Wormeli and National Welding Inspection School. With one on one training from Mr. Wormeli, Leslie learned all the aspects of Pipeline Welding Inspection and began assisting Mr. Wormeli with maintaining and updating his curriculum and manuals and overseeing the course instruction. Leslie works closely with all the instructor’s at NWIS Training, Inc. from helping write the curriculum to designing the course presentations. Leslie also serves on the Welding Advisory Board for Blinn College. This board meets regarding the curriculum for Blinn’s Associate Welding Degree.

### **Mark Hodgson.....Training Director/Instructor**

Mark Hodgson started with Pacific Gas & Electric Company as a welder’s helper in 1986 and progressed through the ranks to journeyman welder. During his apprenticeship he was very interested in inspection and steered his career path in that direction. A turn of events eventually developed into a mentorship by the Level III that worked at Napa Pipe at the time, giving Mark considerable knowledge of NDE practices in the pipeline industry. Mark became an inspector after running jobs and welding and furthered his study of the codes and standards by which the industry operates. Mark returned to a construction supervisor when an opening became available, but an unfortunate incident developed shortly after, placing Mark back into being one of the critical leads over the Pipeline Safety Enhancement Program. This lead position offered Mark the opportunity to meet John Wormeli and they developed a strong relationship and once again, Mark was under another mentor. After a brief time in working with Mark, John knew he had found the person he wanted to continue what he had started in 1977 and asked Mark to begin teaching the CPWI+ course. Mark’s background includes all phases of transmission pipeline construction including hot



and cold tie in methods, gas gathering systems and steel and polyethylene distribution systems. Mark also has extensive knowledge in code compliance in regards to DOT Part 192 and 195, Design and Construction standards ASME B31.8 and B31.4, as well as the interpretation and development of welding procedures under API 1104.

**Ken Clemmer.....Instructor**

Ken works full time for P & L Testing, LLC as their Safety and Training Director and also assists NWIS Training, Inc. as an instructor for their Hydrostatic Test Inspection course. Ken received his bachelor’s degree and MBA from Letourneau University where Mr. Wormeli also received his degree. Ken got his start in the industry working as a pipefitter in Beaumont, TX in area refineries. His work history ranges from being an apprentice to running testing crews to being a general foreman. Ken also owned a fabrication shop for some time. Ken moved to Giddings, TX 3 years ago to begin his career at P & L Testing, LLC testing pipelines and most recently Safety and Training Director.

**Olivier Jouffron.....Instructor**

Olivier works full time for Serimax, LLC as a Welding Engineer with emphasis in NDE and Automatic Welding and also assists NWIS Training, Inc. as the lead instructor for their Pipeline Autoweld Inspection course. Olivier received a Bachelor’s Degree in Civil Engineering and a Master’s Degree in Welding Engineering in France. He has several years’ experience in engineering and Autoweld processes.

**Raymond Navarro, Jr. ....INSTRUCTOR**

Raymond worked several years hand in hand with John Wormeli and learned the aspects of welding inspection and testing coupons for welders. He teaches the hands on portion for amps, volts and travel speed during the CPWI+V course, as well as Imperfection vs Defective as defined in API 1104.

**Travis Sachtleben.....INSTRUCTOR**

Travis is a welder knowledgeable in many different welding processes. He has over 15 years of welding experience. He instructs in the welding booths during the CPWI+ course.

**Joseph Dixon.....INSTRUCTOR**

Joseph works full time for BRL NDT Services in San Antonio, TX. He is a “Certified Welding Inspector” as well as a Level II NDT Technician and has many years of experience in this field.

**Shan Conway.....INSTRUCTOR**

Shan Conway has over 33 years in the oil and gas industry and with a Petroleum Education degree from South Plains College. During his 33 year career in the industry he has worked for Clayton Williams Energy –pumper 3 years, Chesapeake Energy-lease operator 3 years, Candor Resources-Production Foreman 2yrs, Schlumberger Technologies-Field Engineer 4 years, Owner President Flo-Tech Testing Inc., 16 yrs. sold to Schlumberger. Schlumberger Production Testing U.S. operations manager 4 yrs. During his career he has developed years of field experience plus 20 years of management and ownership experience. As owner and manager, Shan was involved in design, maintenance, and development of equipment and building a successful company from the ground up. He, with his business partner, was in charge of 5 offices and 170 employees during his 16 years as owner of Flo-Tech Testing at the time of the sale of Flo-Tech to Schlumberger. As owner of Flo-Tech Testing, Shan worked hand in hand the pipeline companies moving production of oil and gas through the pipelines on a daily basis.

## **TUITION AND FEES**

<b>Course</b>	<b>Tuition</b>	<b>Registration</b>	<b>Total</b>
<b>CPWI+V (Pipeline Welding Inspection)</b>	<b>\$1700</b>	<b>\$100</b>	<b>\$1800</b>
<b>CHTI (Hydrostatic Testing Inspection)</b>	<b>\$1550</b>	<b>\$100</b>	<b>\$1650</b>
<b>CAFI (Advanced Field Inspection)</b>	<b>\$1400</b>	<b>\$100</b>	<b>\$1500</b>
<b>CPAI (Pipeline Autoweld Inspection)</b>	<b>\$1700</b>	<b>\$100</b>	<b>\$1800</b>
<b>API 1169 Prep</b>	<b>\$1150</b>	<b>\$100</b>	<b>\$1250</b>
<b>AWS "CWI" Prep (Part A)</b>	<b>\$800</b>	<b>\$100</b>	<b>\$900</b>
<b>AWS "CWI" Prep (Part B)</b>	<b>\$500</b>	<b>\$100</b>	<b>\$600</b>
<b>AWS "CWI" Prep (Part C)</b>	<b>\$400</b>	<b>\$100</b>	<b>\$500</b>
<b>CPWI Re-certification Test</b>			<b>\$865</b>

**You may reschedule for a different class date at any time, but a \$25 Reschedule Fee will be applied each time.**

## **PAYMENT METHODS**

Tuition should be paid prior to course date. We accept all major credit cards and checks. Credit/Debit card payments may be made when registering on our website at [www.NationalWelding.com](http://www.NationalWelding.com) or calling the office. Checks are to be made payable to NWIS Training, Inc.

We also accept Chapter 31 VA Benefits. Our facility code is 25139543.

## **ENROLLMENT PERIODS**

Registration is open until the selected course date or the course is full. Registration will open once the course is listed on our website at [www.NationalWelding.com](http://www.NationalWelding.com). Classes are usually listed 3 – 4 months prior to course date.

## **COURSE DATES**

Please check our website at [www.NationalWelding.com](http://www.NationalWelding.com) for new course dates and schedules.

## **HOLIDAYS OBSERVED**

New Year's Day, Good Friday, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Christmas Eve, Christmas Day

## **DAILY CLASS SCHEDULE**

The course will begin at 8:00 AM. 10 Minute breaks will be given every other hour (top of the hour) throughout the day. Lunch will be from 12:00 – 1:00 with lunch provided by the school. Class will end by 4:00 each day.

8:00am	9:50am	Class	2hrs
9:50am	10:00am	Break	
10:00am	11:50am	Class	2hrs
11:50am	1:00pm	Lunch	
1:00pm	2:50pm	class	2hrs
2:50pm	3:00pm	Break	
3:00pm	4:00pm	Class	1hrs

## **OFFICE HOURS**

Office hours are from 8:00 AM to 4:00 PM Monday through Thursday and 8:00 AM to 12:00 PM on Fridays.

## **ADMISSION/ENROLLMENT POLICIES**

MINIMUM AGE: 18

Working Knowledge of the Pipeline Industry or Welding

## **REFUND POLICIES**

1. Refund computations will be based on the period of enrollment computed on basis of course time (clock hours).
2. The effective date of termination for refund purposes will be the earliest of the following:
  - (a) the last date of attendance; or
  - (b) the date of receipt of written notice from the student.
3. If tuition and fees are collected in advance of entrance, and the student does not enter school, \$100 shall be retained by the school.
4. If the student fails to enter the seminar, withdraws, or is discontinued at any time before completion of the seminar, the student will be refunded the pro rata portion of tuition, fees and other charges that the number of class hours remaining in the seminar after the effective date of termination bears to the total number of class hours in the seminar.
5. A full refund of all tuition and fees is due and refundable in each of the following cases:
  - (a) An enrollee is not accepted by the school;
  - (b) If the course of instruction is discontinued by the school and this prevents the student from completing the course; or
  - (c) If the student's enrollment was procured as a result of any misrepresentation in advertising, promotional materials of the school, or representations by the owner or representatives of the school.

*A full or partial refund may also be due in other circumstances of course deficiencies or violations of requirements for career schools and colleges.*

6. REFUND POLICY FOR STUDENTS CALLED TO ACTIVE MILITARY SERVICE.

A student of the school or college who withdraws from the school or college as a result of the student being called to active duty in a military service of the United State or the Texas National Guard may elect one of the following options for each course in which the student is enrolled:

- (a) if tuition and fees are collected in advance of the withdrawal, a pro rata refund of any tuition, fees, or other charges paid by the student for the course and cancellation of any unpaid tuition, fees or other charges owed by the student for the portion of the course the student does not complete following withdrawal;
- (b) a grade of incomplete with the designation “withdrawn-military” for the courses in the program, other than courses for which the student has previously received a grade on the student’s transcript, and the right to re-enroll in the course, or a substantially equivalent course if that course is no longer available, not later than the first anniversary of the date the student is discharged from the active military duty without payment of additional tuition, fees or other charges for the course other than previously unpaid balance of the original tuition, fees and charges for books for the course; or
- (c) the assignment of an appropriate final grade or credit for the courses in the program, but only if the instructor or instructors of the course determine that the student has:
  - (1) satisfactorily completed at least 90 percent of the required coursework for the course; and
  - (2) demonstrated sufficient mastery of the course material to receive credit for completing the course.

7. Refunds will be totally consummated within 60 days after the effective date of termination.



**SEMINAR COURSES**  
**OFFERED**

**Course cost:** \$1800

**Overview of Course:**

A welding inspection course for Pipeline Construction and In-Service

Welding leading to a Pipeline Welding Inspector's certificate

**Contact Hours:**

32 contact hours (20 hours lecture, 6 hours lab, 6 hours exam)

**Performance Objectives:**

To properly identify defects in pipeline welding

Familiarize with codes and standards pertaining to new and in-service pipeline welding construction

Know how to use various pipeline welding inspection tools (UT Thickness Gauge, Volt Amp Meter, PI Tape)

Know the proper use of Tensile and Bend machine

Identify procedures in welder qualification and procedure qualification

**Prerequisites:**

Minimum Age of 18

Working knowledge of the Pipeline Industry or Welding

**Required Textbooks:**

None

**Instructional Methods:**

Lecture

Overhead Projector

Hands on Instruction

**Maximum Student: Instructor Ratio:**

30:1

**Materials and Media References:**

API 1104, DOT 192, DOT 195

**Daily Content Outline:**

Day 1 – Introduction, Requirements of an Inspector (2hrs), API 1104 (5hrs)

Day 2 – API 1104 Appendix B(3hrs), DOT 192(1hr), DOT 195(1hr), Weld Defects (2hrs), Visual Inspection

Day 3 – Welder Qualifications (1hr), Elements of Inspection (3hrs), Welding Processes (1hr), Electrodes, Inspection Equipment, Formulas, Radiographic Film Interpretation (1hr)

Day 4 – Hands on Instruction (6hrs)

Day 5 – CPWI+V Test (6hrs)

**Basis of Grades:**

CPWI+V Open Book Test and Visual Inspection Test            100%

Must score at least 75%

A welding inspection course for Pipeline Construction and In-Service welding leading to a Pipeline Welding Inspector's certificate, (CPWI+V™).

Welding Inspection for Transmission and Distribution Pipelines "Hands-On" (CPWI+V)™ originated by Mr. John Wormeli who had over 40 years of welding engineering and non-destructive testing experience on pipelines, pressure vessels and piping systems. John graduated from LeTourneau, Longview, Texas, with a Bachelor of Science degree in Welding Engineering. He worked for ACF Industries for 5 years and Atlantic Richfield for 13 years, prior to forming the National Welding Inspection School and his consulting business.

This course is now taught by Mr. Mark Hodgson who has many years of experience in the industry. Mr. Hodgson had the chance to meet Mr. John Wormeli while working on a project for Pacific Gas & Electric. The team consisting of Mr. Hodgson and Mr. Wormeli were developing updated welding procedures for Pacific Gas & Electric. Little did Mark know, Mr. Wormeli was interviewing Mark to continue what he had started in 1977 and asked Mark to begin teaching the CPWI+V course. Mark is now sharing his considerable knowledge and experience by conducting this CPWI+V course.

This course presents the codes and standards used in the construction of pipelines and distribution systems in the oil and gas industry. Successful completion of this course leads to a Certificate for Pipeline Welding Inspection (CPWI+V) from NWIS Training, Inc. Successful completion includes a passing score of 75% or greater on the 120 question open-book examination and a Visual Inspection Practical Exam. A calculator will be required for this course.

NO video or audio recording devices are allowed during our "Hands-On" CPWI+V™ course without the expressed written consent of NWIS Training, Inc. Thank you for your cooperation.

### **Course Curriculum**

The latest editions (listed in the Code of Federal Regulations) of the following codes and standards presented in the course are listed:

API 1104, Welding of Pipelines and Related Facilities

Appendix B, API 1104, In-Service Welding

API 5L, Specification for Line Pipe

DOT Part 192, Transportation of Natural and Other Gas by Pipeline

DOT Part 195, Transportation of Hazardous Liquids by Pipeline

Specifications for Electrodes and Filler Metals

Additional topics presented in this course include:

Preparation of Welding Procedures

Welder Qualification

Visual Welding Inspection

Pipe Inspection

Weld Joint Designs

Preheat Considerations

Electrode Selection

Weld Passes and effect on Properties

Removal of Arc Burns

Weld Repair Techniques

Weld Toughness (CVN Testing)

Weld and Heat-Affected Zone Hardness

Formulas for Welding Inspection

Weld Defects and Causes

Effect of Magnetism on Weld Quality

Measurement of Welding Parameters

## **COURSE SCHEDULE**

The first day begins with an introduction and scope of the 4 ½ day course. Definitions of pipeline terminology and mechanical testing activities are presented. A detailed presentation of API 1104 including welding procedure development, welder qualification, visual inspection criteria and related topics are covered this first full day.

The second day continues with API 1104. In-Service Welding is presented in depth to assure all attendees are aware of the need for safe and proper procedures when welding on loaded, pressurized pipelines. The details of Appendix B, API 1104, including the proper method for welding procedure development and welder qualification are discussed.

Covered on the third day is the "Inspection of Pipe" using API 5L as the foundation for the acceptance criteria. Inspection items which will be covered for the welding inspector are the dimensional tolerances and the inspection tools used to determine compliance to the pipe manufacturing tolerances.

The effect of magnetism on pipe ends in relation to welding of the root pass will be covered and shown on PowerPoint slides and weld cross-sections. The carbon equivalent of the pipe is discussed in the context of potential hardness and possible cracking. Preheat requirements are discussed in the event the carbon equivalent is higher than industry accepted values.

In the first 2 days, welding electrode selection and the electrode classification system is presented to provide the attendees with the reasons for selecting the electrodes and/or filler metals for the procedure which will assure the deposited weld metal strength meets or exceeds the strength requirements of the pipe material. Other properties such as impact strength (CVN testing) and the very important hardness values of the weld and HAZ are discussed for both new construction and In-Service welds.

Weld Defects and Related cross-sections are presented on the second day also to assist in learning the specific pipeline weld defects and causes for these defects.

The third and fourth day will be a "Hands-On" learning experience in the shop. Everything learned and discussed in the classroom the previous three days will be used by the attendee in the open shop. The attendee will be required to measure

and inspect various pipe welds and diameters along with actual welding with each of the welding processes in the welding booths. A list of just a few of the items which must be completed by each attendee is presented below. It is expected that the entire day will be necessary to complete the "Hands-On" training part.

Note: An instructional aid form will be issued to each attendee to be completed for each of the following activities.

1) Inspect 12 pipe welds requiring a report on Pipe Size, Wall Thickness to determine Visual Defect/s (if any) on O.D. and I.D. The measurement tools including a Dial Caliper and tape measure will be furnished at each pipe sample location within the shop.

2) Measure the 18" pipe to determine the precise diameter at the pipe end using a "PI" (Diameter) tape. The "PI" tape will be provided at the pipe location in the shop.

3) Measure the Wall Thickness of the 18" Pipe to three decimal places at four locations at the marked end using the Ultrasonic Thickness Gage. The UT Gage will be provided.

4) Measure the Gauss Level (magnetic field strength) on the designated pipe using the F.W. Bell Gaussmeter. Determine the gauss level at 12, 3, 6 and 9 O' clock positions. The gaussmeter will be provided.

5) Measure the Amperage and Voltage during welding in the test booth using the Fluke Amp/Volt meters. Record the welding parameters on the form provided. These meters will be provided.

6) Calculate the travel Speed in Inches per Minute (IPM) of the welding in the test booth. A tape measure, stop watch, and calculator will be provided.

7) Calculate the Heat Input (in Joules per Inch) for the welding being done in the test booth. A calculator, ammeter, voltmeter, tape measure and stop watch will be provided.

8) Measure the Tensile specimens for width and thickness and calculate the area of each of four specimens. The specimens, the dial caliper and the caliper will be furnished.

9) Conduct a Tensile Test and calculate the Ultimate Tensile Strength of the specimen and, based on the given Pipe Grade (X42,X52,X60,X70), determine if the specimen is acceptable or if it failed according to API 1104. The specimen will be marked for the test. The calculator will be furnished.

10) Conduct a Bend Test, either one Root Bend or one Face Bend, and one Nick Break Test and determine their acceptance or failure in accordance with API 1104.

The "CPWI+V" open-book test will be administered in the classroom beginning at 7:00 am. The test will be graded and a certificate, a laminated card, and letter of attendance, with a unique registration number, is issued to all attendees who have passed the exam. A score of 75% is required for passing.

**Upon Completion of this course, you will receive a CPWI+V Certificate stating your passing and completion of this course. This certificate is good for 3 years. After 3 years, you may renew your certificate by completing a renewal test. (CPWI+V Recertification)**



# **CHTI Hydrostatic Testing Inspection Course**

**Course Cost: \$1650**

## **Overview of Course:**

A course designed to teach inspectors how to properly conduct a Hydrostatic Test on pipelines and at pipeline related facilities in a safe and accurate manner.

## **Contact Hours:**

14 hours (8 hours lecture, 4 hours lab, 2 hours exam)

## **Performance Objectives:**

Understand the importance of a hydrostatic test

Know how to correctly read pressure charts and various types of pressure recording methods

Identify safety concerns and proper techniques in conducting a hydrostatic test

Know the steps for planning, engineering and permitting of the hydrostatic test

## **Prerequisites:**

Minimum Age of 18

Working knowledge of the Pipeline Industry or Welding

## **Required Textbooks:**

None

**Instructional Methods:**

Lecture

Overhead Projector

Hands on Instruction

**Maximum Student: Instructor Ratio:**

30:1

**Materials and Media References:**

DOT 192

**Daily Content Outline:**

Day 1 – Introduction, Planning and Permitting, Hydro Testing Specification

Day 2 – Inspector Formulas, Hands – On Field Test, Pipe Burst Testing Field Activity Review, CHTI Test

**Basis of Grades:**

CHTI Open Book Test            100%

Must score at least 70%

The purpose of this 2 Day course is to train the inspector on all aspects of conducting the "Test" in a safe and accurate manner. Learning the safety concerns and procedures which must be followed are presented in the classroom. How to read the pressure charts and the various types of pressure recording methods will be discussed in the classroom and demonstrated in the field on a pipeline system. The pressure recording charts will be discussed and explained so the inspector will be able to interpret the charts and determine if a "Good Test" was achieved.

The first day will involve classroom discussion from the beginning of the planning process to pressure calculations to calculating water requirements to discharge water.

The second day will involve meeting in the field and observe the actual hydrostatic testing of a pipeline. Instructors will conduct "Hands-on" training and demonstrate the procedure to be followed and important sequences which will guarantee a safe and successful "Test."

(Note: Be sure to wear appropriate footwear and clothing for the ROW).

Upon completion of a successful "Hydrostatic Test", A second test will be conducted which will involve "Bursting a Test Pipe" by increasing the pressure on the pipe to above its' yield strength and then determining where the failure occurred. Some of the fracture points will be ground into the pipe, some will be arc burns and other fracture locations will be added as considered appropriate. The test pipe will be in a below ground "Burst Chamber" surrounded by TV cameras with LED Lights for filming the pressure test and fracture. Another camera will record the pressure gage and this will be incorporated into a film of the entire event for each class.

An examination will be given the afternoon of the second day regarding all of the information learned in the field and as well as class discussions. The test will be open book and consist of 30 questions. A score of 70 is required for passing.

A certificate, laminated card and letter will be issued to each attendee who successfully passes the exam. You will receive a certificate for "Hydrostatic Testing Inspector" which is verification that the individual has attended the Hydrostatic Testing Inspection Course at NWIS Training, Inc. and is capable of inspecting over and witnessing Hydrostatic Testing for pipelines.

# **CAFI** **Advanced Field Inspection Course**

**Course Cost: \$1500**

## **Overview of Course:**

A course designed to obtain in depth knowledge of pipeline welding inspection and the newest technology on survey and mapping and traceability of pipe.

## **Subject Hours:**

14 hours (8 hours lecture, 4 hours lab, 2 hours exam)

## **Performance Objectives:**

Understand how to read & interpret welding procedures

Understand how to read alignment sheets and understand survey numbering systems

Know how to correctly develop and qualify welding procedures and the destructive testing requirements according to API 1104

Learn how to use mobile data collectors to provide pipe and weld traceability

## **Prerequisites:**

**CPWI+ Certificate is required to take this course**

## **Required Textbooks:**

None

**Instructional Methods:**

Lecture

Overhead Projector

Hands on Instruction

**Maximum Student: Instructor Ratio:**

30:1

**Materials and Media References:**

API 1104, DOT 192, DOT 195, C.A.T.S.

**Daily Content Outline:**

Day 1 – Introduction, Welding Procedure Development

Day 2 – Survey and Mapping, CATS pipeline traceability, CAFI Test

**Basis of Grades:**

CAFI Open Book Test            100%

Must score at least 70%

NWIS Training, Inc. will conduct a 2 day Advanced Field Inspection Course (CAFI) which is an extension of their CPWI+ for Transmission and Distribution pipeline systems. A CPWI+ Certificate is a required prerequisite of this course.

The "Advanced" course will provide instruction on developing welding procedures, reading and interpreting welding procedures, so the attendee can fill out the procedure forms meeting all DOT and API 1104 requirements. Field/Shop pipeline welding will be done and the attendee will be required to verify that the approved procedure is being followed or if the welding is being done without adherence to the procedure.

Attendees will also be taught how to use mobile data collectors to provide pipe and weld traceability. You will learn how to create a pup for engineered cuts in the field and to maintain the pipe traceability through the use of generating a new bar code. In addition, you will learn how to record all of the information, such as pipe manufactures' heat numbers, weld numbers, GPS location of each weld, date of weld, etc., the pipeline owner is required to maintain for the life of the pipeline, through hands-on work on our field pipeline. Mobile data collection is an important part of this course and is the way some present and most future pipelines will be documented. Upon completion of the training you will be certified as a Project Consulting Service CATS® field technician.

The explanation on state-of-the-art surveying and mapping will be presented so the attendee will learn how to read alignment sheets and understand the survey numbering system. Field experience will be gained by reading the survey stakes on our own pipeline section. The attendee will learn how the identification of Drag Sections are handled by the survey crews for the final placement in the line.

It is expected that this course will prepare the new, as well as, the experienced inspector with additional knowledge on welding procedures, scanning techniques and surveying/mapping techniques needed to perform their duties in a more competent manner.

On the second day a 50 question open-book exam will be given in the classroom. A score of 70 is required for passing the course.

**A prerequisite for this Advanced Field Inspection course is that the attendee must have attended and passed the CPWI+ course which discusses all of the pipeline codes and standards.**

**Course Cost: \$1800**

**Overview of Course:**

A course designed to obtain in depth knowledge of automatic pipeline welding inspection

**Subject Hours:**

25 hours (12 hours lecture, 10 hours lab, 3 hours exam)

**Performance Objectives:**

Understand the features of Automatic Welding

Obtain an insight on pipe end preparations and parameter control

Effectively notice typical weld defects

Understand weld acceptance criteria and troubleshooting techniques

**Prerequisites:**

Minimum Age of 18

Working knowledge of the Pipeline Industry or Welding

**Required Textbooks:**

None

**Instructional Methods:**

Lecture

Overhead Projector

Hands on Instruction

**Maximum Student: Instructor Ratio:**

30:1

**Materials and Media References:**

API 1104, DOT 192, DOT 195

**Daily Content Outline:**

Day 1 – Introduction, Practical safety aspect, History and reasons for automatic welding systems, Overview of systems

Day 2 – Preparation of pipe ends, Demonstrations of actual equipment, Bevel inspection and measurements

Day 3 – Typical weld defects, Testing methods, Troubleshooting, Test

**Basis of Grades:**

CPAI Open Book Test            100%

Must score at least 70%



## **INTRODUCTION**

The *Pipeline Autoweld Inspection (CPAI™)* course explains the backgrounds and features of Automatic Welding for landlines and offshore pipelines and provides inspectors with an insight in pipe end preparations, parameter control, typical weld defects, weld acceptance criteria and field trouble shooting.

The course provides a blend of theoretical backgrounds, demonstrations of automatic welding methods, pipe end preparations and practical exercises providing the participants with the various aspects occurring in the field.

The lead instructors for this course have many years of automatic welding experience on land and lay barges between them.

Course participants will have access to the wealth of combined experience and know-how from working with automatic welding systems on pipeline projects around the world.

A basic understanding of welding and inspection is strongly recommended for this course. A simple calculator will be required for this course.

## **COURSE CURRICULUM**

The 3 ½ day course is presented from the course manual and switch to demonstrations, videos and hands-on inspection exercises to help create an interactive learning environment.

Each of the 3 course days will focus on particular aspects of automatic welding such as origin, safety, different systems in the market, their typical use and features, pipe end preparation, weld parameter monitoring, weld defects and causes as well as some troubleshooting techniques.

Successful completion of this course leads to a Certificate of Pipeline Autoweld Inspection from the NWIS Training, Inc..

Individuals completing the course will have knowledge of basic automatic welding problems in the field and how to capture these through rational problem solving.

### **FIRST DAY**

After general housekeeping rules and introduction of the facilities and instructors, Day 1 starts with the practical safety aspect, to then discuss the history and reasons why automatic welding systems are used on pipelines. Hereafter, the course provides an overview of pipeline welding systems, shown on video and demonstrations of one of these systems using different processes including parameter programming and read-out.

### **SECOND DAY**

The importance of the correct preparation of pipe ends and bevels is emphasized and how manufacturing of the line pipe can impact the pipe end preparation and welding results. This will be followed by a demonstration of actual equipment, show samples of bevels and counter bore methods and finally, hands-on exercises in bevel inspection and measurement.

### **THIRD DAY**

The final instruction day provides an insight in the types and causes of common weld defects and the severity of these defects in weld failure. Hereafter, the types and limitations of Non Destructive Testing methods are reviewed including their capability and limitations of detecting the defects in automatic weld configuration. Finally, this day will discuss how Trouble Shooting of welding defects can be systematically approached, followed by some exercises where the course material of the past 3 days has to be utilized to reason through the possible causes of weld defects.

### **EXAMINATION DAY**

The morning of the last day will consist of an open-book test consisting of 90 multiple choice questions from the class manual, the practical exercises and the demonstrations. The purpose of the test is to confirm the ability of the course participants to perform inspection of automatic welding operations and systems. The test will be graded and upon successful completion, the "CPAI" certificate is issued.

## **API 1169 Prep**

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**Course Cost: \$1250**

### **Overview of Course:**

A Preparatory course developed that will provide students with the knowledge necessary to take the API 1169 Certification Exam. This course covers in depth the Body of Knowledge set by API for the Exam.

### **Contact Hours:**

32 hours lecture

### **Performance Objectives:**

Familiarize with codes and standards pertaining to pipeline welding inspection

Familiarize with Recommended Practices and Specifications pertaining to pipeline welding inspection

Know how to navigate various CFRs and other federal regulations covered on the API 1169 Exam

### **Prerequisites:**

Must meet API's exam candidate requirements.

**INSPECTION EXPERIENCE**

<b>Experience Required</b>	<b>Years of Experience</b>	<b>Plus Education</b>
<b>PIPELINE INSPECTION</b> Experience acquired in areas such as Utility inspection, Pressure/Leak Testing, Welding Inspection, Coating Inspection, Safety Inspection	3 years	Any or no education
	2 years	BS or 2-year degree in a technical discipline, engineering or technology <b>OR</b> 2 years of military service in a technical role
<b>GENERAL OIL &amp; GAS INSPECTION</b> Experience acquired in areas such as: Equipment Inspection, NDT, In-service Inspection, Visual Inspection, Welding Inspection, Pressure/Leak Testing, Inspection of Aboveground Storage Tanks, Piping or Pressure Vessels, Manufacturing/Source Inspection	3 years	BS or 2-year degree in a technical discipline, engineering or technology <b>OR</b> 2 years of military service in a technical role
	4 years	High School, GED or no education

**NON-INSPECTION PIPELINE EXPERIENCE**

<b>Experience Required</b>	<b>Years of Experience</b>	<b>Plus Education</b>
Experience acquired in areas such as: Pipeline Construction, Pipeline Surveyor, Pipeline Operation, Welding, Fitting, Coating, Operation of Heavy Equipment, Pipeline Safety Supervisor	4 years	BS or 2-year degree in a technical discipline, engineering or technology <b>OR</b> 2 years of military service in a technical role
	5 years	High School, GED or no education

**GENERAL OIL & GAS INDUSTRY EXPERIENCE**

Experience Required	Years of Experience	Plus Education	Plus Certification
Experience acquired at any petrochemical facility, such as refinery or petrochemical plants.  Experience may relate to: Operation, Construction and repair of petrochemical equipment.	Total of 4 years which includes <u>at least 1 year</u> of Pipeline Specific experience	Any or no education	Any certification from any of the following: <ul style="list-style-type: none"> <li>• AWS, CWB</li> <li>• NACE (Level II or greater)</li> <li>• API</li> <li>• ASNT (Level II or greater)</li> </ul>
	6 years	Any or no education	Any certification from any of the following: <ul style="list-style-type: none"> <li>• AWS, CWB</li> <li>• NACE (Level II or greater)</li> <li>• API</li> <li>• ASNT (Level II or greater)</li> </ul>

**OTHER HEAVY INDUSTRY EXPERIENCE**

Experience Required	Years of Experience	Plus Education	Plus Certification
Experience acquired in industries or areas such as: Road Building, Civil Construction, Mining, Logging, Heavy Equipment Operating, Blasting	5 years	BS or 2-year degree in a technical discipline, engineering or technology	N/A
	8 years	Any or no education	Any certification from any of the following: <ul style="list-style-type: none"> <li>• AWS, CWB</li> <li>• NACE (Level II or greater)</li> <li>• API</li> <li>• ASNT (Level II or greater)</li> </ul>

**Required Textbooks:**

Study Material will be provided for use during the course

**Instructional Methods:**

Lecture

Overhead Projector

**Maximum Student: Instructor Ratio:**

30:1

**Materials and Media References:**

All Materials as listed on API 1169 Exam Publication Effectivity Sheet. Please refer to API's website for a detailed list of reference material.

**Daily Content Outline:**

Day 1 – Introduction (30 min), Fundamentals and Vocabulary (30 min), API 1104 (7hrs)

Day 2 – API Spec Q1 (1hr), ANSI Z49.1 (1hr), CEPA Guidelines (6hrs)

Day 3 – CGA Best Practices (1hr), INGAA Guidelines(1hr), Various Federal Codes (6hrs)

Day 4 – API 1169 (4hrs), API 1110 (4hrs)

**Basis of Grades:**

API administers the exam at a Prometric Testing Facility. You must register with API for your exam. Please refer to API's website for all testing information.

**Course Cost: \$900**

**Overview of Course:**

A Preparatory Course developed that will provide students with the knowledge necessary to take the AWS “CWI” Certification Exam. This course covers in depth the Body of Knowledge set by AWS for the Exam.

**Contact Hours:**

32 hours lecture

**Performance Objectives:**

Gain proficiency with Welding Inspection Technology

**Prerequisites:**

Must meet AWS (American Welding Society) “CWI” exam candidate requirements.

**MINIMUM EDUCATION**

Bachelor or higher degree in welding engineering or welding technology - (4) years maximum substitution

Associate or higher degree in welding or non-welding related engineering technology, engineering, or a physical science - (3) years maximum substitution

**MINIMUM WORK EXPERIENCE**

Minimum of (1) years welding based work experience

Minimum of (2) years welding based work experience

Engineering/Technical courses that can be applied to Bachelor or higher degree in Welding - (2) years maximum substitution	Minimum of (3) years welding based work experience
Trade/Vocational courses - (1) year maximum substitution for successfully completed courses	Minimum of (4) years welding based work experience
High school diploma or approved high school equivalency diploma	Minimum of (5) years welding based work experience
8th grade level of schooling	Minimum of (9) years welding based work experience
Less than 8th grade	Minimum of (12) years welding based work experience

**Required Textbooks:**

API 1104 (current edition listed in Code of Federal Regulations)

All other study material will be provided for use during the course

**Instructional Methods:**

Lecture

Overhead Projector

Hands on Instruction

**Maximum Student: Instructor Ratio:**

30:1

**Materials and Media References:**

Welding Inspection Technology



### **Daily Content Outline:**

Day 1 – Introduction, Safe Practices, Metal Joining and Cutting Processes (8hrs)

Day 2 – Terminology and Weld Joint Geometry and Welding Symbols, Documents Governing Welding Inspection and Qualification (8hrs)

Day 3 – Metal Properties and Destructive Testing, Metric Practices, Welding Metallurgy (8hrs)

Day 4 – Evaluation of Weld and Base Metal Discontinuities, VT and Other NDE Methods and Symbols (8hrs)

### **Basis of Grades:**

AWS administers the exam at our facility on the Saturday following the course. You must register with AWS for your exam. Please refer to AWS's website for all testing information.

# **AWS “ CWI” Prep      Part B – Visual Inspection Workshop**

**Course Cost: \$600**

## **Overview of Course:**

A Preparatory Course developed that will provide students with the knowledge necessary to take the AWS “CWI” Certification Exam. This course covers in depth the Body of Knowledge set by AWS for the Exam.

## **Contact Hours:**

16 hours Lecture and Hands-on Instruction

## **Performance Objectives:**

Gain proficiency with Book of Specifications and tools required to measure models and apply code.

## **Prerequisites:**

Must meet AWS (American Welding Society) “CWI” exam candidate requirements.

### **MINIMUM EDUCATION**

Bachelor or higher degree in welding engineering or welding technology - (4) years maximum substitution

Associate or higher degree in welding or non-welding related engineering technology, engineering, or a physical science - (3) years maximum substitution

### **MINIMUM WORK EXPERIENCE**

Minimum of (1) years welding based work experience

Minimum of (2) years welding based work experience

Engineering/Technical courses that can be applied to Bachelor or higher degree in Welding - (2) years maximum substitution	Minimum of (3) years welding based work experience
Trade/Vocational courses - (1) year maximum substitution for successfully completed courses	Minimum of (4) years welding based work experience
High school diploma or approved high school equivalency diploma	Minimum of (5) years welding based work experience
8th grade level of schooling	Minimum of (9) years welding based work experience
Less than 8th grade	Minimum of (12) years welding based work experience

**Required Textbooks:**

AWS Book of Specifications (provided by NWIS for use during course)

**Instructional Methods:**

Lecture

Overhead Projector

Hands on Instruction

**Maximum Student: Instructor Ratio:**

30:1

### **Materials and Media References:**

AWS Book of Specifications

### **Daily Content Outline:**

Day 1 – AWS Book of Specifications Review (8 hrs)

Day 2 – Hands-On Learning with Models (8 hrs)

### **Basis of Grades:**

AWS administers the exam at our facility on the Saturday following the course. You must register with AWS for your exam. Please refer to AWS's website for all testing information.

**Course Cost: \$500**

**Overview of Course:**

A Preparatory Course developed that will provide students with the knowledge necessary to take the AWS “CWI” Certification Exam. This course covers in depth the Body of Knowledge set by AWS for the Exam.

**Contact Hours:**

16 hours Lecture

**Performance Objectives:**

Gain proficiency with API 1104, Welding Pipelines and Related Facilities and learn how to navigate.

**Prerequisites:**

Must meet AWS (American Welding Society) “CWI” exam candidate requirements.

**MINIMUM EDUCATION**

Bachelor or higher degree in welding engineering or welding technology - (4) years maximum substitution

Associate or higher degree in welding or non-welding related engineering technology, engineering, or a physical science - (3) years maximum substitution

**MINIMUM WORK EXPERIENCE**

Minimum of (1) years welding based work experience

Minimum of (2) years welding based work experience

Engineering/Technical courses that can be applied to Bachelor or higher degree in Welding - (2) years maximum substitution	Minimum of (3) years welding based work experience
Trade/Vocational courses - (1) year maximum substitution for successfully completed courses	Minimum of (4) years welding based work experience
High school diploma or approved high school equivalency diploma	Minimum of (5) years welding based work experience
8th grade level of schooling	Minimum of (9) years welding based work experience
Less than 8th grade	Minimum of (12) years welding based work experience

**Required Textbooks:**

API 1104 (current edition listed in Code of Federal Regulations)

All other study material will be provided for use during the course

**Instructional Methods:**

Lecture

Overhead Projector

**Maximum Student: Instructor Ratio:**

30:1

**Materials and Media References:**

API 1104, Welding of Pipelines and Related Facilities (current edition listed in Code of Federal Regulations)

**Daily Content Outline:**

Day 1 – API 1104, Chapters 1-5 (8 hrs)

Day 2 – API 1104, Chapters 6-13 (8 hrs)

**Basis of Grades:**

AWS administers the exam at our facility on the Saturday following the course. You must register with AWS for your exam. Please refer to AWS's website for all testing information.

## **GRADING SYSTEM**

A passing grade of 75 or above is required to receive a certificate for CPWI+V seminar.

A passing grade of 70 or above is required to receive a certificate for CHTI, CAFI & CPAI seminars

If a student is unsuccessful, they may schedule to retake the exam for a \$500 fee. If the student is still unsuccessful in achieving a passing score, they will be required to retake the course to obtain their certificate.

## **ATTENDANCE POLICY**

Each student is expected to be in attendance for each day of instruction and on testing day. Any leave of absence for medical, work or personal issues must be approved by the instructor and director.

## **GRIEVANCES/COMPLAINTS**

**Please send complaints to:**

Texas Workforce Commission  
Career Schools and Colleges, Room 226T  
101 East 15<sup>th</sup> Street  
Austin, Texas 78778-0001  
Phone: (512) 936-3100  
[www.texasworkforce.org/careerschools](http://www.texasworkforce.org/careerschools)



## **TRUE AND CORRECT STATEMENT**

I hereby certify that the statements and information in this catalog are true and correct to the best of my knowledge and belief.

A handwritten signature in black ink, appearing to read "Leslie Wittu". The signature is written in a cursive style with a large initial "L".

Leslie Wittu  
**DIRECTOR**  
**NWIS Training, Inc.**