API INDIVIDUAL CERTIFICATION PROGRAM
BODY OF KNOWLEDGE FOUNDATION COURSE

WHAT YOU WILL LEARN:

Delegates attending the programme will:

- Gain an understanding of pressure vessel, piping and AST Design
- Learn how to recognise deterioration and failure modes applicable to pressure vessels
- Learn how to use the relevant API & ASME codes
- Understand how to apply the several inspection methods as required by the API & ASME codes
- Understand how to apply API RP 579 "Fitness For Service" and API RP 580 "Risk Based Inspection"
- Be shown how to develop a learning regimen to empower them to successfully pass the API ICP examinations

WHO SHOULD ATTEND:

- Inspection engineers and supervisors
- Maintenance and production engineers and supervisors who are personally responsible for the reliable design, operation, maintenance and repair of pressure vessels, piping and tankage
- Individuals who are responsible for evaluating the mechanical integrity of in-service pressure vessels, piping and tankage in process plant applications
- Managers who are responsible for implementing a static plant maintenance program and desire an understanding of applicable evaluation procedures

The Workshop

This practical, applications-oriented course covers knowledge common to all factors in the API ICP examinations for pressure vessels, pipelines and piping systems and atmospheric storage tanks. The knowledge covered includes ASME boiler & pressure vessel code sections V and IX, API 'Risk Based Inspection' recommended practice (RP) 580, API RP 577 welding and metallurgy, API RP 571 damage mechanisms as well as the new API/ASME joint 'Fitness for Service' standard.

As well as preparing the delegates for supplementary exams 571 and 580, upon completion of this course, delegates will also have a foundation for further development and successful completion of the following API ICP courses:

- API 510 Pressure Vessels Inspection
- API 570 Inspection of Pipelines & Piping
- API 653 Inspection of Above ground Storage Tanks.

Practical Sessions

During the practical sessions you will be carrying out calculations based on API & ASME codes so that you become familiar with code requirements.

What to Bring

Delegates should bring along a laptop preloaded with a spreadsheet programme such as MS-Excel. At the very least you will need a calculator.

We also advise each delegate to bring the necessary publications for each of the exams with them for quick reference and notes. API offers "exam packs" for each exam (please visit www.techstreet.com)

Publications referenced in the ICP examinations:

API Publications	510	570	653
510	✘		
570		✘	
571	✘	✘	✘
572	✘		
574		✘	
575			✘
576	✘		
577	✘	✘	✘
650			✘
651			✘
652			✘
653			✘
ASME Publications			
B&PVC Section V	✘	✘	✘
B&PVC Section VIII	✘		
B&PVC Section IX	✘	✘	✘
B16.5		✘	
B31.3		✘	

The Program

API RP 571 - DAMAGE MECHANISMS

- Overview
- Mechanical & metallurgical failure mechanisms
- Uniform or loss of thickness
- High temperature corrosion
- Environment assisted cracking
- Refining industry damage mechanisms

NDE TECHNIQUES AND WELDING (1/2 DAY)

- ASME V
  - NDE techniques
  - NDE procedures & documentation
- ASME IX
  - welding data
  - WPS, PQR, WPQ.
- APIRP577
  - welding NDE
  - welding metallurgy

API RP 580

- Structure of the standard

RISK-BASED DECISION-MAKING FUNDAMENTALS AND TOOLS

- Risk assessment - probability of failure, consequences of failure
- Risk management - avoidance, mitigation
- Risk communication.

UNDERSTANDING AND MANAGING RISK

- Principles risk assessment
- Risk assessment elements
- Qualitative, semi-quantitative, and quantitative assessment

API RISK-BASED INSPECTION METHODOLOGY

- API RP 580
- API BRD 581 - Various levels of RBI analyses

API BRD 581

- Overview of the document
- RBI approach based on APIRP580

THE RBI COOKBOOK

- Determination of probability of failure
- Consequence analysis

INSPECTION PLANNING

- The definitive API risk matrix
- Pressure vessels & piping
- Atmospheric storage tanks
- Pressure relief devices

FITNESS FOR SERVICE API 579-1/ ASME FFS-1

- Overview & structure of the standard

METALLURGICAL ISSUES

- Brittle fracture
- Creep

CORROSION ISSUES

- General & localized corrosion
- Pitting
- H2S attack

PHYSICAL DAMAGE

- Cracks
- Distortions & misalignment
- Fire damage
- Dents & gauges