PD645
BPV Code, Section IX: Welding, Brazing, and Fusing Qualifications

Day One

- Module 1: Welding Process Basics – basic features of some more commonly used welding processes
  - Overview
  - Oxyfuel Welding (OFW)
  - Shielded Metal-Arc Welding (SMAW)
  - Gas Metal-Arc Welding (GMAW)
  - Flux Cored-Arc Welding (FCAW)
  - Gas Tungsten-Arc Welding (GTAW)
  - Submerged-Arc Welding (SAW)
  - Plasma-Arc Welding (PAW)
  - Other Welding Processes

- Module 2: Metallurgy & Welding Metallurgy – basic metallurgy concepts and how they apply to welding
  - Introduction
  - Overview
  - Basic Steel Metallurgy
  - Hardenability
  - Stainless Steels
  - Other Alloy Systems
  - Basics of Mechanical Testing
  - Basics of Welding Metallurgy

Day Two

- Module 3: Code Basics – layout, scope & responsibilities
  - Background
  - Layout of Section IX
  - Part QW Article I Welding General Requirements
  - Part QW Article II Welding Procedure Qualifications
  - Part QW Article III Welding Performance Qualifications
  - Part QW Article IV Welding Data
  - Part QW Article V Standard Welding Procedure Specifications (SWPSs)
  - Part QB Brazing

- Module 4: WPS Qualification Variables for SMAW – the basic WPS qualification variables in Table QW-253
  - Introduction
  - Variables
  - QW-402 Joints
  - QW-403 Base Metals
  - QW-404 Filler Metals
  - QW-405 Positions
  - QW-406 Preheat
• Module 5: Notch Toughness & Supplementary Essential Variables – notch toughness & modification of a WPS using supplementary essential variables
  - Notch-Toughness
  - Supplementary Essential Variables
  - Qualification of a WPS With Notch Toughness

Day Three

• Module 6: Developing a WPS – information needed to generate a WPS that is code-compliant, economical for the fabricator and useful to the welder
  - Introduction
  - Essential Variables
  - Nonessential Variables
  - Client Requirements
  - Developing a WPS

• Module 7: Qualifying Welding Personnel – the essential variables for qualifying welders/welding operators in Article III
  - Introduction
  - Essential Variables
  - Manual And Semiautomatic Welding
  - Other Processes
  - Automatic Welding Processes
  - Machine Welding Processes
  - Generating A Welding Performance Qualification