

## ASME SECTION IX WELDING & BRAZING QUALIFICATIONS

### OBJECTIVE:

The objective of this course is to provide participants with an understanding of the rules of ASME Section IX in controlling the welding qualifications for pressure containing components and the bases for these rules. There will be references, as appropriate, to how these rules apply to the design and fabrication requirements of the construction codes. Emphasis will be given to the importance of using engineering judgment in the application of the welding procedures and welder performance qualifications during the construction of pressure containing components. The course will also cover the bases for the rules by discussing how materials may be affected by the welding processes. Welding processes and their implementation and control will be discussed. Slides and videos will be shown to emphasize the discussion points. The course will also provide ample opportunity to discuss issues raised by the participants. An overview of the Canadian requirements for welding qualifications will be presented and explaining how Section IX is a legal requirement in Canada.

### CONTENTS: A two-day course consisting of the following:

DAY 1:	DAY 2:
<ul style="list-style-type: none"> <li>• Introduction to ASME Section IX               <ul style="list-style-type: none"> <li>- Organization</li> <li>- Special Processes</li> <li>- Purpose of Control of Welding</li> <li>- Qualification</li> <li>- Design Assumption</li> </ul> </li> <li>• Impact of Provincial Laws</li> <li>• Metallurgy of Steels               <ul style="list-style-type: none"> <li>- Structure</li> <li>- Alloying</li> <li>- Hardenability</li> <li>- Effect of Welding</li> <li>- Residual Stresses</li> </ul> </li> <li>• Welding Processes               <ul style="list-style-type: none"> <li>- Discussion of Process Characteristics</li> </ul> </li> <li>• Section IX Variables               <ul style="list-style-type: none"> <li>- Essential Variables</li> <li>- Nonessential Variables</li> <li>- Supplementary Essential Variables</li> </ul> </li> <li>• Material Groups               <ul style="list-style-type: none"> <li>- P Numbers</li> <li>- F Numbers</li> <li>- A Numbers</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Section IX Welding Documents               <ul style="list-style-type: none"> <li>- Welding Procedure Specification (WPS)</li> <li>- Procedure Qualification Record (PQR)</li> <li>- Welder Performance Qualification Record (WPO)</li> <li>- Welding Operator Performance Qualification Record (WOPO)</li> </ul> </li> <li>• Welding Procedure Qualification               <ul style="list-style-type: none"> <li>- Making a Plan</li> <li>- Selecting a Base Material</li> <li>- Select Filler Metal</li> <li>- Making the Weld and Recording Variables</li> <li>- Testing</li> </ul> </li> <li>• Writing the WPS               <ul style="list-style-type: none"> <li>- Standard Forms</li> <li>- Variations in Style</li> </ul> </li> <li>• Performance Qualification Testing               <ul style="list-style-type: none"> <li>- Making a Plan</li> <li>- Selecting Base Metals</li> <li>- Selecting the Filler Metal</li> <li>- Making the Weld and Recording Variables</li> <li>- Testing</li> </ul> </li> <li>• Maintaining Qualification               <ul style="list-style-type: none"> <li>- Periodic Usage (Continuity)</li> <li>- Revoking Qualification for Reason</li> </ul> </li> </ul>

### WHO SHOULD ATTEND?

This course is excellent training for persons whose work activity requires them to interact with the ASME Section IX Welding & Brazing Qualification Code. It is targeted at the personnel that have responsibilities for meeting the fabrication requirements of the Code and of meeting the design specifications while actually building the piping systems. Inspection personnel and designers and engineers responsible for the design of the piping systems would also find this course to be very useful. This is true for any people involved in the above work in the fossil or the nuclear power industry as well as those that are working on industrial or institutional systems involving pressure retaining components. It will enhance their

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understanding of what is behind the various requirements and enable them to conform more readily to these requirements. The course will be useful to the many disciplines that are required to understand and implement Code requirements. These disciplines include construction managers, designers, engineers, fabrication supervisors, inspectors, and maintenance personnel.

#### EXPECTATIONS:

Course participants with adequate experience will have attained the following information at the end of the course:

1. An understanding of the ASME Section IX rules concerning welding procedure and performance qualification.
2. An understanding of the bases for these rules.
3. A basic knowledge of how the properties of steels are affected as a result of welding.
4. A basic knowledge of how the special process of welding is qualified and controlled.
5. An understanding of an approach to welding procedure qualification.
6. An understanding of an approach to welder performance qualification.