

## SYLLABUS OF ASME VIII DIV 1 COURSE

Time allocations : 3 Days (Offline – Morning Class)  
Trainer (tentative) : TBA  
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### PARTICIPANTS QUALIFICATIONS

This course is applicable to all personnel working in the oil and gas, and petrochemical industry, and who are involved in the design, procurement, engineering construction, operation, maintenance, and inspection of in-service pressure vessel systems and related facilities.

### COURSE DESCRIPTION

This course focuses on learning to become familiar with the layout and contents of the ASME VIII Division 1 Code.

The main emphasis of this program is on promoting safety and maintaining optimal performance through the use of participants specialized in pressure vessels system. It provides the oil and gas, and petrochemical industry with the assurance that pressure vessel participants trained under this in-house training program have the required knowledge and experience for the job in the field.

ASME VIII Division 1 is divided into 4 sections (Introduction, Part UG, Part UW, Part UCS) and 4 appendices and relevant figures & tables. Even when taken together, these are not sufficient to specify fully a methodology for ASME VIII Division 1.

### COURSE PURPOSE

Generally, this course is essential for pressure vessels participant. The main aim of this course is to provide the participants to obtain the technical standards in ASME VIII Division 1 Code.

### COURSE LEARNING OUTCOMES

Course Materials	Learning Outcomes
ASME VIII Div 1	<p>By the end of learning this topic, the participant should be able to understand the content and application of ASME VIII DIV 1 that describes the Rules for Construction of Pressure Vessels.</p> <p><u>Introduction:</u></p> <p>Participants should understand:</p> <ol style="list-style-type: none"><li>The scope of the Code Stamps (U, UM, UV &amp; UD)</li><li>The requirements of user's design requirements</li><li>Type of manufacturer's data reports</li><li>Units measurements</li></ol> <p><u>Joint Efficiencies</u></p> <p>Participant must be able to determine the joint efficiency "E" of a vessel weld. Participant should be able to determine:</p> <ol style="list-style-type: none"><li>Weld joint categories (ASME BPVC Section VIII, UW-3)</li></ol>

ASME VIII Div 1	<p>b) Type of radiography (full, spot, or none) performed basis the nameplate markings (RT-1, RT-2, etc.) (UW-11)</p> <p>c) Joint efficiency by reading Table UW-12</p> <p>d) Joint efficiency for seamless heads and vessels sections per UW-12(d)</p> <p>e) Joint efficiency for welded pipe and tubing per UW-12(e)</p> <p><u>Static Head</u></p> <p>Participant must be able to compensate for the pressure resulting from static head. All static head will be based upon a Specific Gravity of 1.0. The participant should be able to:</p> <p>a) List the static head/pressure conversion factor (0.433 psi/ft)</p> <p>b) Know the difference between vessel MAWP and vessel part MAWP (ASME BPVC Section VIII, UG-98)</p> <p>c) Calculate static head pressure on any vessel part</p> <p>d) Calculate total pressure (MAWP + static head) on any vessel part</p> <p>e) Calculate maximum vessel MAWP given vessel parts MAWP and elevations</p> <p><u>Internal Pressure</u></p> <p>Participant should be able to determine:</p> <p>a) The required thickness of a cylindrical shell based on circumferential stress given a pressure (UG-27(c)(1))</p> <p>b) The required thickness of a spherical shell based on circumferential stress given a pressure (UG-27(d))</p> <p>c) The vessel part MAWP for a cylindrical shell based on circumferential stress given a metal thickness (UG-27(c)(1))</p> <p>d) The required thickness of a head (ellipsoidal, and hemispherical) given a pressure (UG-32(c), and (e))</p> <p>e) The vessel part MAWP for a head (ellipsoidal, and hemispherical) given a metal thickness (UG-32(c), and (e))</p> <p>f) Whether a head (ellipsoidal or hemispherical) meets Code requirements given both pressure and metal thickness (UG 32(c) and (e))</p> <p><u>External Pressure</u></p> <p>Participant should be knowledgeable of the rules for design of shells and tubes under external pressure (UG-28). The participant will not be required to perform external pressure calculations.</p> <p><u>Pressure Testing</u></p> <p>Participant should be able to:</p> <p>a) Calculate a test pressure compensating for temperature. (UG-99 and UG-100)</p> <p>b) Be familiar with the precautions associated with hydrostatic and pneumatic testing, such as minimum test temperatures, protection against overpressure etc</p> <p>c) Be familiar with all steps in a hydrotest procedure (UG-99 and UG-100)</p> <p>d) Be familiar with all steps in a pneumatic test procedure (UG-100 and UG-102)</p> <p><u>Impact Testing</u></p> <p>a) The inspector should understand impact testing requirements and impact testing procedure (UG-84)</p> <p>b) The inspector should be able to determine the minimum metal temperature of a material which is exempt from impact testing (UG-20(f), UCS-66, UCS-68(c))</p>
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ASME VIII Div 1	<p><u>Weld Size for Attachment Welds at Openings</u></p> <p>Participant must be able to determine if weld sizes meet Code requirements. The participant should be able to:</p> <ol style="list-style-type: none"> <li>Convert a fillet weld throat dimension to leg dimension or vice versa, using conversion factor (0.7)</li> <li>Determine the required size of welds at opening (UW-16)</li> </ol> <p><u>General Welding Requirements</u></p> <p>Participant should be familiar with and understand the general rules for welding in ASME BPVC Section VIII, Div. 1, parts UW such as:</p> <ol style="list-style-type: none"> <li>Typical joints and definitions</li> <li>Weld sizes</li> <li>Restrictions on joints</li> <li>Maximum allowable reinforcement</li> <li>Inspection requirements</li> <li>Heat treatment</li> </ol> <p><u>Requirement of Carbon Steel and Low Alloy PV</u></p> <p>The Participant should understand the requirements of Carbon Steel &amp; Low Alloy Pressure Vessels. Such as:</p> <ol style="list-style-type: none"> <li>PV listed materials</li> <li>Welded joints</li> <li>Impact tests</li> <li>Heat treatments</li> </ol> <p><u>General nondestructive examination requirements</u></p> <p>Participants should be familiar with and understand the general rules for NDE (UG, UW, UCS, Appendices 4, 6, 8, and 12)</p> <p>Participants should understand requirements of Appendix 47 and Appendix W (Manufacturer's Data Reports)</p>
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## COURSE REGULATIONS

- All participants must know and understand the procedure of joining the course
- All participants have to come at the latest 5 minutes before the class starts
- All participants must bring the updated course material during the class
- All participants must know the syllabus and time schedule as the study guidance
- The participants have to join the class minimum 80% of total hour of the course
- If the participants need assistance, or any information related to the course program, they should ask the staffs of Ladwer Institute
- If the participants do not understand the course material, the participants may ask the instructor during the class or out the class
- All participants have to finish the quiz/ exams to complete the Ladwer Institute's Certificate
- All participants have to complete the participants' feedback form to give opinions, suggestions, and complaint to develop our course
- The certificate will be given to participants maximum 7 days after the class finishes

### COURSE FORMAT (Offline - Morning Class)

Day	08.00 AM – 10.00 AM	10.00 AM – 10.15 AM	10.15 AM – 12.00 PM	12.00 PM – 13.00 PM	13.00 PM – 15.30 PM	15.30 PM – 15.45 PM	15.45 PM – 17.00 PM	15.45 PM – 17.30 PM
1	Introduction, ASME VIII DIV 1	<b>Coffee Break</b>	ASME VIII DIV 1	<b>Lunch Break</b>	ASME VIII DIV 1	<b>Coffee Break</b>	ASME VIII DIV 1	
2	ASME VIII DIV 1		ASME VIII DIV 1		ASME VIII DIV 1		ASME VIII DIV 1	
3	ASME VIII DIV 1		ASME VIII DIV 1		ASME VIII DIV 1		ASME VIII DIV 1	

### REFERENCES

1. American Society of Mechanical Engineers (ASME), Boiler and Pressure Vessel Code, 2023 Edition, Section VIII, Rules for Construction of Pressure Vessels, Division 1; Introduction (U), UG, UW, UCS, Appendices 1-4, 6, 8, 12