PUNJAB BOARD OF TECHNICAL EDUCATION

21-A, Kashmir Block Allama Iqbal Town, Lahore

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SAY NO TO CORRUPTION

No: PBTE/R&D/2026/21 Dated: 28-01-2026

NOTIFICATION

In pursuance of the NAVTTC Notification No. (D.G) (SS&C)/2021-QD-1 dated 26.11.2025, it is notified that the newly developed curricula of the following short courses have been approved by National Vocational & Technical Training Commission (NAVTTC) for their implementation with immediate effect in all institutes affiliated with PBTE.

- Advance Health Safety, Environment & Fire Safety Officer (6-months Course)
- Heat Exchanger Maintenance Technician (6-Months Course)
- Quality Assurance & Quality Control Technician (3-Months Course)
- Fabrication Supervisor (3-Months Course)
- Pressure Vessel Maintenance Technician (3-Months Course)

Soft copy of the curricula of the said courses may be downloaded from the website of PBTE i.e. www.pbte.edu.pk/textbooks.html.

SECRETARY

CC to:

1- PS to Chairperson PBTE, Lahore.
2- PA to Secretary PBTE, Lahore.
3- PA to Controller of Examinations PBTE, Lahore.
4- PA to DG Academics TEVTA, Lahore.
5- PA to DG Operations TEVTA, Lahore.
6- The Principals concerned.
7- Deputy Controller of Examinations (Conduct) PBTE, Lahore
8- Deputy Controller of Examinations (Secrecy) PBTE, Lahore.
9- System Analyst PBTE, Lahore.
10-Assistant Controller of Examinations (Technical) PBTE, Lahore.
11-Assistant Controller of Examinations (Conduct) PBTE, Lahore.
12-Assistant Controller of Examinations (Secrecy) PBTE, Lahore.
13-Assistant Controller of Examinations (P&P-I) PBTE, Lahore.
14-Assistant Controller of Examinations (P&P-II) PBTE, Lahore.
15-Assistant Secretary (Recognition) PBTE, Lahore.
16-IPS PBTE, Lahore.
17-IOW PBTE, Lahore.
18-Web Administrator PBTE, Lahore to upload on website of PBTE.
19-Notification File.

PRESSURE VESSEL MAINTENANCE TECHNICIAN

03 Months Course





MANSOL TECHNICAL TRAINING SERVICES (PVT) LTD

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Training Objective

The prime objective of this course is to give Training of Pressure Vessel Maintenance to develop and enhance the skill level of the incumbent in this trade of oil and gas construction industry.

Semi-skilled and skilled worker produced by this training would help to reduce unemployment and poverty in the society. This curriculum is designed to train the Matric / Intermediate / DAE or above qualified persons who are facing a lot of problems to do the work as Pressure-Vessel-Maintenance-Technician in the field of oil and gas construction industry.

This training program will provide opportunity to those who want to equip themselves with such knowledge and skills which will be helpful for their employment after completing this training of 06 months and would enable them to start their own business with professional approach.

Further, this Curriculum is developed by considering the requirements of local and international market and need of the trade enabling the pass-outs to meet the job market to reduce the shortage of Semi-Skilled and Skilled workers in the area.

CURRICULUM SALIENTS:

Entry Level	Matric
Total Duration of Course	03-Months (12 Weeks)
Total Training Hours	240 hrs 4hrs / Day 20 hrs / week
Training Methodology	80 % Practical 20 % Theory
Instructional Media	Urdu / English

SKILL PROFICIENCY DETAILS

After completion of the course the trainee must be able to:

1. Observe all safety precautions during handling, fabrication, and maintenance of pressure vessels.
2. Use measuring, marking, and layout tools accurately for pressure vessel fabrication.
3. Perform proper cutting, grinding, and drilling operations on pressure vessel materials.
4. Identify different types of metals and materials used in pressure vessels and distinguish defects.
5. Operate power tools like cutting machines, drill machines, grinders, and beveling machines efficiently.
6. Mark nozzle openings, manholes, and flanges accurately as per pressure vessel drawings.
7. Use different types of fasteners (bolts, nuts, studs) in assembling vessel components.
8. Install gaskets, nozzles, and flanges following correct pressure vessel installation procedures.
9. Perform welding preparation activities such as edge preparation, fit-up, and tacking.
10. Tighten and loosen bolts on vessel flanges, inspection ports, and manways according to torque requirements.
11. Carry out internal and external inspection of pressure vessels for corrosion, cracks, or leaks.
12. Assemble and dismantle pressure vessel parts during fabrication, maintenance, and repair operations.
13. Follow fabrication, testing, and certification procedures according to relevant pressure vessel codes and standards.
14. Interpret fabrication drawings, isometric sketches, and material specifications related to pressure vessels.
15. Perform hydrostatic and pneumatic testing preparation activities under supervision.
16. Clean and prepare vessel surfaces for painting, lining, or coating applications.

KNOWLEDGE PROFICIENCY DETAILS

After completion the course the trainee would have gained knowledge about: -

1. Understand applicable safety precautions while working on pressure vessels using hand tools, power tools, and heavy equipment.
2. Explain the common types of materials (metals and alloys) used in pressure vessel fabrication and their properties.
3. Describe the use of marking and measuring tools essential for pressure vessel layout and assembly.
4. Understand different types of grinders, cutting tools, and gripping tools commonly used in pressure vessel fabrication.
5. Identify and discuss various types of fasteners, bolts, nuts, studs, and hardware used in pressure vessel construction.
6. Explain finishing techniques, including surface preparation, priming, and painting of pressure vessel surfaces.
7. Discuss the types of flanges, valves, fittings, and gaskets used in pressure vessels and the correct procedures for loosening and tightening them.
8. Explain the different types of pressure vessels (e.g., horizontal, vertical, reactors, separators) and their specific applications.
9. Understand the purpose and proper usage of hand tools, pneumatic tools, and power tools during pressure vessel work.
10. Describe common maintenance and repair procedures, including inspection, welding repairs, and corrosion prevention.
11. Discuss rigging activities, lifting techniques, and safe handling of heavy vessel components.
12. Understand the process and importance of hydro jetting for cleaning pressure vessels before inspection or service.
13. Explain different types of work permits required (hot work, confined space entry, lifting permits) during vessel operations.
14. Understand the basics of welding methods used in pressure vessel fabrication (SMAW, GTAW, MIG/MAG).
15. Describe the process and importance of Non-Destructive Testing (NDT) methods like ultrasonic, radiographic, and dye penetrant testing.

16. Explain hydrostatic and pneumatic testing procedures for pressure vessel quality assurance.
17. Discuss common causes of vessel failure, such as corrosion, overpressure, material fatigue, and poor maintenance practices.
18. Understand the basic standards and codes applicable to pressure vessels (ASME Section VIII, API standards, etc.).
19. Explain basic pressure vessel design parameters like internal pressure, temperature, thickness calculation, and allowable stress.
20. Discuss safety practices for confined space entry when working inside pressure vessels.

Scheme of Study

Pressure Vessel Maintenance Technician

(03-Months Course)

Sr. No	Main Topics	Theory Hrs.	Practical Hrs.	Total Hrs.
1	**Pressure Vessel Safety & Operations**	10	40	50
2	**ASME / API Code Awareness**	10	40	50
3	**Non-Destructive Test**	12	48	60
4	**Welding Procedures**	12	48	60
5	**Hydro / Pneumatic Testing**	13	52	65
6	**Risk Assessment & Emergency Drills**	13	52	65
7	**Shutdown Maintenance Planning**	10	40	50
	TOTAL	**80**	**320**	**400**

Detail of Course Contents

Pressure Vessel Maintenance Technician
(03-Months Course)

Sr. No	Main Topics	Theory Hrs.	Practical Hrs.	Total Hrs.
1.	**A- Pressure Vessel Safety and Operations** a. Personal Safety (PPE) b. PTW (Permit to Work) c. Work at Height d. Gas Testing e. Ventilation System f. Confined Space Activities g. Hazard identification & Control	10	40	50
2	**B- ASME / API Code Awareness** a. Codes / Standards / Basic Concepts b. Design & Fabrication Basics c. American Society of Mechanical Engineers (ASME) Standard for Pressure Vessels (BPVC) d. American Petroleum Institute (API) – 510 Standard for Pressure Vessel Inspection Code e. American Petroleum Institute (API) – 572 Standard for Pressure Vessel Inspection Code f. ASTM A285 g. Basics of Pressure Vessels	10	40	50
3	**C- Non-Destructive Test** a. Bend Test b. Hardness Test c. Ultrasonic Testing (UT) d. Magnetic Particle Testing (MT) e. Liquid Penetrant Testing (PT) f. Radiographic Testing (RT) g. Visual Inspection (VT)	12	48	60

4	**D- Welding Procedures** a. Forge Welding b. Friction Welding c. Resistance Welding d. Fusion Welding i. MMA (Manual Metal Arc Welding) ii. MIG/MAG (Metal Inert Gas / Metal Active Gas) iii. TIG (Tungsten Inert Gas Welding) iv. SAW (Sub-Merge Arc Welding) v. LBW (Laser Beam Welding) e. Welding Defects & Inspection	12	48	60
5	**E- Hydro / Pneumatic Testing** a. Hydro Test for PV Shell b. Pneumatic Test for PV Shell c. Nitrogen Leak & Pressure Testing	13	52	65
6	**F- Risk Assessment & Emergency Drills** a. Task Risk Assessment (TRA) b. Job Safety Analysis (JSA) c. Job Hazard Analysis (JHA) d. Fire Emergency Drill e. Gas Leak Emergency Drill	13	52	65
7	**G- Shutdown Maintenance Planning** a. Zero Energy b. Scaffolding c. Isolation d. Opening of Pressure Vessel e. Internal Cleaning of Pressure Vessel f. General Maintenance g. Final Inspection h. Box up i. Emergency Maintenance	10	40	50
	TOTAL	80	320	400

List of Practical's

Sr	Description
1	**Preparation and installation of Scaffolding on Pressure Vessel** Students will work in groups. Design and install scaffolding to provide safe access to the pressure vessel for inspection, maintenance, and repair activities.
2	**Isolation of Pressure Vessel** Students will work in groups. Implement isolation procedures to ensure the pressure vessel was safely disconnected from process lines and energy sources.
3	**Mian Way opening & closing (Box-up) Methods** Students will work in groups. Check pressure vessel is closed and secure after maintenance, with all openings sealed and systems restored to operational status and report findings.
4	**Internal Parts removal and cleaning with re-installation** Students will work in groups. Remove internal components of the pressure vessel for thorough cleaning and inspection, ensuring all parts are handled and stored safely.
5	**Corrosion identification and remedy** Students will work in groups. Implement corrective actions to address identified defects, including repairs, replacements, or modifications to restore vessel integrity and report findings.
6	**Maintenance Welding of Pressure Vessels** Students will work in groups. Perform maintenance welding on pressure vessels using approved procedures and qualified welders to repair defects or damage.
7	**Confined Space Entry / Exit of Pressure Vessel Shell** Students will work in groups. Check workers use proper personal protective equipment (PPE) and followed entry/exit protocols to minimize risks in the confined space.
8	**Internal Cleaning & Final Inspection of Inside Shell** Students will work in groups. Clean the internal surfaces of the pressure vessel shell to remove debris, scale, or contaminants, preparing it for inspection.
9	**Removal of Demister Pads, Cleaning & re-installation**

	Students will work in groups. Remove demister pads from the pressure vessel for cleaning and inspection, taking care to handle and store them properly.
10	**De-blinding & House Keeping** Students will work in groups. Maintain a clean and organized work area around the pressure vessel through effective housekeeping practices, minimizing hazards and improving safety.

List of Labs:

1. Mechanical Lab
2. Pressure Vessel (Proto-type Model) Lab

LIST OF MACHINERY, EQUIPMENT & TOOLS

For 25 Students

Name of trade	Pressure Vessel Maintenance Technician
Duration	03 Months

Sr. No.	Description	Qty
1	PLIER	5
2	WIRE CUTTER	5
3	COMBINATION SPANNER 27mm to 48mm	5
4	SOCKET SET 27mm to 48mm	5
5	MEASURING TAPE 5m	5
6	STEEL SCALE 300mm	5
7	TRI SQUARE 6” & 8” (5 each)	10
8	RING SPANNER 27mm to 48mm	5
9	OPEN END SPANNER 27mm to 48mm	5
10	PENCIL GRINDER	5
11	ANGLE GRINDER 4" (Electric & Noematic)	5
12	HAND SPIRIT LEVEL 12”	10
13	HAMMER BRASS 1kg	2
14	CENTER PUNCH	4
15	ADJUSTABLE WRENCH 12”	10
16	FLANGE SPLITTER	1
17	ROUND FILE	2
18	HALF ROUND FILE	2
19	FLAT FILE	2
20	SPUD OPEN SPANNER 27mm to 48mm	5
21	SPUD RING SPANNER 27mm to 48mm	5
22	STRIKING OPEN SPANNER 27mm to 48mm	5
23	STRIKING RING SPANNER 27mm to 48mm	5
24	TONG / CROW BAR 1m	2
25	CHAIN BLOCK 2 Ton	2
26	TORQUE WRENCH	2
27	CHAIN WRENCH	5
28	WIRE SLING 2m	2
29	SCRAPPER 4”	2
30	WIRE BRUSH	15
31	I BOLT ½” & 3/4 “	2
32	FINGER SAVER	15

33	HEAVY DUTY SCREW DRIVER	6
34	WELDING PLANT	4

LIST OF CONSUMEABLE MATERIALS FOR PRACTICALS

(For 06 Months Pressure Vessel Maintenance Technician)

Sr	Consumable Materials	Qty
1	ASBESTOS GASKET CLASS 24X150 RATING	4
2	BLIND SPADE 2x150	12
3	TEST SPADE 2x150	8
4	SPIRAL WOUND GASKET 2x150	30
5	EMERY PAPER 0 size	36
6	GRAPHITE TAPE 1/2“& ¾” – Rolls	4
7	WIRE BRUSH	10
8	BARICATION TAPE – Roll	2
9	COTTON WASTE – KG	20
10	WORK PERMIT – STATIONERY PAPER	30
11	COVERALL	25
12	SAFETY SHOES	25
13	SAFETY HELMET	25
14	SAFETY GOOGLE	25
15	WORKING GLOVES (COTTON) PAIR	100
16	MOLIKOT BOX	2
17	LIFTING BAG	2
18	FACE SHIELD	10
19	DIP TRAY	2
20	PAINT BRUSH 2”	6
21	SCRAPPER	10
22	CUP WIRE BRUSH 4” & 7” EACH	5

EMPLOYABILITY OF PASS-OUTS

After completion the course successfully, the students would be able to join as Pressure Vessel Maintenance Technician in construction industry and also, they would be capable to start their own business. The pass-out of this course may work in the following sectors / areas and positions as skilled professional:

1. Plant construction (Power houses, Fertilizer plants, Cement plants, and Oil & Gas plants).
2. To start their own business.
3. To work in specific field like maintenance / shutdown services.
4. To work as contractor / sub-contractor.

QUALIFICATION OF TEACHER / INSTRUCTOR

a) Instructor

Diploma (Mech) with 5 years' experience

OR

Bachelor (Mechanical) with 2-Years' experience

b) Demonstrator

Matric with 03-Years' experience in Construction Industry / Oil & Gas and the ability to use computers

REFERENCE BOOKS:

1. **PRESSURE VESSELS**
   Authors: Arpit Mistry & Abhishek Chavan 1st Edition 2002
2. **OFFSHORE EQUIPMENT**
   Author: Yutake Seo - January 13, 2019
3. **PRESSURE VESSEL HANDBOOK**
   Author: Euhene F Megyesy - 1995

Curriculum Development Committee (CDC)

1.	Mr. Ibrar Ali Rana	Instructor
2.	Mr. Saleem Akhtar Qureshi	Consultant Curriculum Development
3.	Mr. Amir Aziz	Consultant Curriculum Development
4.	Mr. Ali Khalique Khan	Consultant Curriculum Development