Australian Government

PMASUP245 Break and make flanged joints using hand tools

Release: 1

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Modification History

Release 1. Supersedes and is equivalent to PMASUP245A Break and make flanged joints using hand tools

Application

This unit of competency covers the skills and knowledge required to break and make flanged pipe joints using hand tools.

This unit of competency does not apply where pneumatic, hydraulic or powered torqueing tools are required to be used.

This unit of competency applies to operators who are required to identify requirements for the work, ensure they are working within their skill level, confirm isolations are in place, apply procedures to break and make joints, undertake checks and inspections, complete records, and identify problems and take appropriate action.

This unit of competency applies to an individual working alone or as part of a team or group and working in liaison with other shift team members and the control room operator, as appropriate.

This unit of competency aligns to the technical information in *ASME PCC-1-2013 Guidelines for pressure boundary bolted flange joint assembly.*

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Pre-requisite Unit

Nil

Competency Field

Support

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.		Performance criteria describe the performance needed to demonstrate achievement of the element.	
1	**Plan and prepare for job**	1.1	Identify work requirements
		1.2	Inspect job site

		1.3	Confirm isolations have been completed to standard
		1.4	Confirm hazard controls
		1.5	Coordinate with appropriate personnel
		1.6	Select appropriate tools
		1.7	Check calibration and certification of tools in accordance with procedures
		1.8	Re-check that work requirements fit within skill level
		1.9	Complete required checklists and records
2	**Break flange in accordance with flange management procedure**	2.1	Implement hazard controls
		2.2	Prepare tools, drip trays, and so on, with appropriate care
		2.3	Connect any required drain lines
		2.4	Undo nuts in accordance with procedures
		2.5	Split flange and drain pipe as required
		2.6	Identify any skills escalation required
		2.7	Manage open pipe to ensure contents are not contaminated or damaged
		2.8	Complete checklists and records as required
3	**Inspect flange and components**	3.1	Inspect removed gasket for indications of flange problems
		3.2	Assess cold pull and refer to appropriate personnel if required
		3.3	Assess degree of misalignment and refer to appropriate personnel if required
		3.4	Clean and inspect flange surface both front and back
		3.5	Check studs and nuts

		3.6	Confirm compliance of components and refer to appropriate personnel as required
		3.7	Identify any problems and take action
4	**Make flange joint in accordance with flange management procedure**	4.1	Select appropriate gasket
		4.2	Check all components are to specification
		4.3	Apply lubricant as required
		4.4	Complete initial assembly of joint
		4.5	Insert blind, blank or spectacle/goggle blind as required
		4.6	Attach drain if required
		4.7	Re-check the gasket
		4.8	Re-check alignment
		4.9	Tighten using appropriate hand tools to procedure
		4.10	Use torque calibration charts as required
		4.11	Complete checklists and records as required
5	**Finish the job**	5.1	Make a final check of joint alignment
		5.2	Organise required checks
		5.3	Confirm joint integrity as required
		5.4	Complete checklists and records as required

Foundation Skills

This section describes those language, literacy, numeracy and employment skills that are essential to performance.

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.

Regulatory framework

The latest version of all legislation, regulations, industry codes of practice and Australian/international standards, or the version specified by the local regulatory authority, must be used, and include one or more of the following:

- legislative requirements, including work health and safety (WHS)
- industry codes of practice and guidelines
- environmental regulations and guidelines
- Australian and other standards
- licence and certification requirements

All operations to which this unit applies are subject to stringent health, safety and environment (HSE) requirements, which may be imposed through state/territory or federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and HSE requirements, the HSE requirements take precedence.

Procedures

All operations must be performed in accordance with relevant procedures.

Procedures are written, verbal, visual, computer-based or in some other form, include one or more of the following:

- emergency procedures
- work instructions
- standard operating procedures (SOPs)
- safe work method statements (SWMS)
- formulas/recipes
- batch sheets
- temporary instructions
- any similar instructions provided for the smooth running of the plant

Hazards

Hazards include one or more of the following:

- gases and liquids under pressure
- structural hazards
- equipment failures

- industrial (machinery, equipment and product)
- equipment or product mass
- plant services (steam, condensate and cooling water)
- limited head spaces or overhangs
- working at heights, in restricted or confined spaces, or in environments subjected to heat, dusts or vapours
- flammability and explosivity
- hazardous products and materials
- unauthorised personnel
- sharp edges, protrusions or obstructions
- slippery surfaces, spills or leaks
- extreme weather
- other hazards that might arise

Routine problems

Routine problems must be resolved by applying known solutions.

Routine problems are predictable and include one or more of the following:

- seal/gasket leaks
- pressure loss/low flow
- blockages/build-up/fouling
- erosion/wear
- ancillary equipment problems
- studs incorrectly tensioned
- worn threads
- misalignments
- cold pull
- isolation failure
- leak test failure

Known solutions are drawn from one or more of the following:

- procedures
- training
- remembered experience

Non-routine problems must be reported according to according to relevant procedures.

Action

Action in response to problems includes the following:

- determining problems needing action
- accessing and applying relevant technical and plant data
- applying appropriate problem solving techniques to determine possible fault causes
- rectifying problem using appropriate solution within area of responsibility
- following through items initiated until final resolution has occurred
- reporting problems outside area of responsibility/ability to resolve to designated person

Action also requires one or more of the following:

- replacing existing components with new components
- carrying out minor maintenance within operator's skill level
- identifying and reporting problems outside operator's competence
- identifying and controlling hazards related to flange joints

Work requirements

Work requirements include one or more of the following:

- flange and gasket specifications
- stud and nut specification
- process line and process materials
- parts and equipment required
- local detectors requiring isolation
- required skill level
- conflicting work

Work requirements come from briefings, handovers, and work orders and include one or more of the following

- compliance documentation
- product specifications
- nature and scope of tasks
- achievement targets
- operational conditions
- lighting conditions
- plant or equipment defects
- hazards and potential hazards
- coordination requirements or issues

Job site

Inspecting job site includes identifying one or more of the following:

- location
- authorisations required
- access and egress needs
- hazards
- recent work undertaken on joint
- flange type (matches specification)

Implementing hazard controls

Implementing hazard controls includes one or more of the following:

- selection and use of appropriate personal protective equipment (PPE)
- obtaining appropriate authorisations
- checking required isolations
- controlling other work in area
- controlling access to area
- using gas tester
- verifying and confirming isolation
- safe flange breaking procedure (line of fire)

Inspecting components

Inspecting flange components includes one or more of the following:

- asbestos in gaskets
- signs of damage, defects or deterioration in all components
- cleanliness and correct surface roughness of mating surfaces
- alignment

Refer to appendices of *ASME PCC-1-2013 Guidelines for pressure boundary bolted flange joint assembly*, for technical details.

Components

Components include the following:

- studs
- nuts
- washers
- gaskets
- other components as appropriate to the job/work environment

Checking studs and nuts

Checking studs and nuts includes one or more of: the following

- integrity of studs and nuts

- fit of nut to stud
- need for new studs and nuts
- conformance

Initial assembly of joint

Initial assembly of joint includes one or more of the following:

- aligning joint
- inserting studs
- assembling nuts to studs
- inserting and aligning gasket

Blinds

Blinds include one or more of the following:

- blinds
- blanks
- spectacle/goggle blinds

Appropriate personnel

Appropriate personnel will be someone with the required skills, knowledge and/or authority to deal with the matter, including one or both of the following:

- a supervisor
- an engineer

Checklists and records

Checklists and records may include one or more of the following:

- paper or electronic-based
- verbal/radio reports
- reporting items found which require action

Unit Mapping Information

Release 1. Supersedes and is equivalent to PMASUP245A Break and make flanged joints using hand tools

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=9fc2cf53-e570-4e9f-ad6a-b228ffdb6875