Institute of Materials, Malaysia

IMM Mechanical Joint Integrity Certification Scheme

Mechanical Joint Integrity (MJI) for Flange Bolted Connections

Code: MJI-FL

This certification scheme is designed to equip workers with knowledge concerning typical flange/clamp bolted connections, covering supplementary health, safety and environment, fundamental theoretical knowledge, assembly and reinstatement, post assembly checking/testing, and periodic inspection.
It covers both theoretical knowledge and hands-on skills relevant to LOPC prevention and repair in flanged bolted connections. It provides the theoretical basis and practical competencies required by a worker to sit for assessment so as to be a certified competent technician in Mechanical Joint Integrity (MJI) for Flange Bolted Connections.

Who should apply

This scheme is for those who have to execute installation, assembly and dis-assembly, maintenance and repair, operations, works supervision and inspection of flange/clamp bolted connections, such as:

- Frontline flange assemblers (for pressure vessels, process equipment, plant piping and pipeline)
- Fitters/Riggers
- Site Team Leaders
- Quality and Inspection personnel
- Construction superintendent
- Construction supervisors

Objectives

The objective of this certification program is to assess and certify workers on their knowledge and hands-on skills/competency concerning flange/clamp bolted connections, which covers supplementary health, safety and environment, fundamental theoretical knowledge, dis-assembly, inspection, assembly and reinstatement, post assembly checking/testing, and periodic inspection.

Exam topics

Supplementary health, safety and environmental knowledge when carrying out the works
Grounding knowledge required to carry out the works, covering flanges, gaskets, bolts, torqueing, inspection aspects, testing aspects, manual torque wrench hydraulic torque wrench, clamp connector
Hands-on skills in using a manual torque wrench and hydraulic torque wrench:

- Preparation and set-up of the works
- Reading and interpreting P&ID and isometric drawings
- Preparing a simple workpack if there is no workpack provided for the works
- Reading and selecting correct torque value from a torque table
- Disassembly
- Inspection of the tools, flanges, bolts, gaskets, lubricants used
- Assembly
- Post-assembly inspection and testing
- Periodic inspection

Exam format

The exam/assessment consist of the following format:

(a) Examination paper – to complete answering the 25 to 35 multi-choice questions within 45 minutes
(b) Practical (hands-on) assessment 1 – using a manual torque wrench, including inspection, set-up, using torque table, checking the validity of the calibration certificate, setting the wrench, actual disassembly, assembly, post-assembly inspection and testing.
(c) Practical (hands-on) assessment 2 – using a pneumatic-powered hydraulic torque wrench, including inspection, set-up, using torque table, checking the validity of the calibration certificate, setting the wrench, actual disassembly, assembly, post-assembly inspection and testing.
(d) Practical (hands-on) assessment 3 – using a clamp connector (e.g. Grayloc), including inspection, set-up, referring to the manufacturer's instructions, setting the wrench, actual disassembly, assembly, post-assembly inspection and testing.

Exam duration

1 day

Candidate's criteria

This certification is for those who have to execute installation, assembly and dis-assembly, maintenance and repair, operations and inspection of flange/clamp bolted connections, such as:

- Frontline flange assemblers for pipeline, pipework and process equipment, pressure vessels, towers, rotating machinery
- Fitters/Riggers for piping or pipeline
- Mechanical Technicians
- Maintenance and Construction Team Leaders, Supervisors
- Quality Inspection personnel

Minimum candidate criteria:

- Minimum 5 years working experience at site (offshore or for onshore plant/construction site)
- Have used manual torque wrench or supervised workers using manual torque wrench and hydraulic torque wrench for flange bolted connections
- Fit-for work for offshore or for onshore plant/construction site
- Able to read and understand in English

Pre-requisite training

There is no mandatory pre-requisite training for this certification program.

However, the candidate is strongly encouraged to also attend the 3-day MJI-FL training as the training prepares and provide comprehensive guidance and practice to the candidate in depth for the examination and hands-on practical assessments on flange bolted connections, manual and hydraulic torque wrenches as well as clamp/hub connectors.

Criteria for competency

Successful in all of the following 4 parts:

(a) Examination paper – achieve minimum 60% mark, paper to be marked by the assessor
(b) Practical (hands-on) assessment 1 – Passed as competent by the assessor
(c) Practical (hands-on) assessment 2 – Passed as competent by the assessor
(d) Practical (hands-on) assessment 3 – Passed as competent by the assessor

Certificate awarded

IMM Certified Technician in Mechanical Joint Integrity (MJI) for Flange Bolted Connections

Validity period of certificate

5 years

Information on re-certification

Upon expiry of the 5-year certification, candidate can renew his/her certification for another 3 years by sitting for an examination paper and not required to undergo a practical hands-on examination provided he/she can prove to IMM that he/she has been handling hands-on the manual torque wrench as well as the hydraulic torque wrench (testify by project manager or human resource/training/ learning manager of the candidate) for at least 1,000 workhours in the last 5 years.

At the end of the 3 years additional certification, the candidate is required to go through the full exam/assessment, as follows;

(a) Examination paper – achieve minimum 60% mark
(b) Practical (hands-on) assessment 1 – Passed as competent
(c) Practical (hands-on) assessment 2 – Passed as competent
(d) Practical (hands-on) assessment 3 – Passed as competent