INSTITUTE OF MATERIALS, MALAYSIA

MECHANICAL JOINT INTEGRITY

COMPETENCY CERTIFICATION SCHEME

27 July 2022

Approved by Examination and Certification Panel

1. INTRODUCTION

This brochure serves as a guide for obtaining the Institute of Materials, Malaysia (IMM) mechanical joint integrity assessment and certification. It is designed to satisfy the requirements of the oil and gas exploration and production (EP) industry, energy, marine, manufacturing and other industries for formally assessed and certified vibration practitioner in accordance to Oil and Gas industry standards.

This certification program is designed to equip workers with grounding knowledge of leak repairs pertaining to valves/small bore piping (SBP) and tubing, causes of LOPC in valves, small bore piping and tubing, identification of leaks, planning of repair works, hands-on skills in executing the repairs, post-repair activities, 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 Small-bore Piping, Tubing and Valves and Flange Bolted Connections

There are two categories of MJI certification:

- Certified Technician in Mechanical Joint Integrity for Small-bore Piping, Tubing and Valves
- Certified Technician in Mechanical Joint Integrity for Flange Bolted Connections

<u>Reference standards (reference used shall refer to the latest published document):</u>

- TBA

2. WHO SHOULD ATTEND

i. Certified Technician in Mechanical Joint Integrity for Small-bore Piping, Tubing and Valves
   - Those who are in the key roles of installation, assembly and dis-assembly, maintenance and repair, operations and inspection of valves, packing, tubing, compression fittings, small-bore piping and threaded connections, such as:
     - Instrument supervisors/team leads
     - Valve technicians
     - Mechanical technicians
     - Maintenance technicians (mechanical/instrument discipline)
     - Instrument specialists/engineers

- Operations (multi-skilled) technicians
- Well services personnel dealing with wellhead control panels, chokes and valves

ii. Certified Technician in Mechanical Joint Integrity for Flange Bolted Connections
   - 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 pipeline, pipework and process equipment, pressure vessels, towers, rotating machinery
     - Fitters/riggers
     - Mechanical technicians
     - Site team leaders
     - Quality and inspection personnel
     - Maintenance and construction team leaders, supervisors

3. EXAMINATION AND ASSESSMENT

The candidate will be assessed by IMM on their competency as follows:

Certified Technician in Mechanical Joint Integrity for Small-bore Piping, Tubing and Valves

A 1-day examination will be conducted and consist of the following format:

(a) Examination paper – to complete answering the 35 multiple choice questions within 45 minutes
(b) Practical (hands-on) assessment 1 – Valve packing replacement; consisting of dis-assembly of a valve bonnet, replace the valve packing, re-assembly of the valve bonnet onto valve body, including valve and pipework inspection, set-up, post-assembly inspection and testing using compressed air to check for packing leaks, and re-tightening of packing (if required to stop the packing leak).
(c) Practical (hands-on) assessment 2 – Tube measurement, cutting and bending (3/8" or 10mm OD);
   i. Using a tube bender, cutter, gap inspection gauge and fitting wrenches, the activity consists of correctly bending and cutting a tube as per given tube drawing, installing a 3/8" or 10mm tube union or 3/8" or 10mm NPT connector.
   ii. Removing and re-installing a pressure gauge from/into a ½ NPT process connection

The candidate must pass in all the following 3 parts:
(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

Certified Technician in Mechanical Joint Integrity for Flange Bolted Connections

A 1-day examination will be conducted and consist of the following format:

(a) Examination paper – to complete answering the 35 multiple choice questions within 45 minutes
(b) Practical (hands-on) assessment 1 – using a manual torque wrench, including inspection, set-up, using torquentable, 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.

The candidate must pass in all the following 4 parts:
(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

The assessment program includes a two-hour pre-assessment briefing covering a quick 'run through' of all the topics to be covered in the assessment, the examination format, the duration allocated and followed by the examination.

Assessment schedule

TBA

The above assessments may be held at an Authorised Testing Centre (ATC) or immediately following the related training course conducted by Associate Training Partner (ATP)/Authorised Training Centre (ATB).

4. LANGUAGE

The lectures and assessments will be conducted in English or Bahasa Malaysia or local dialects (where possible).

5. CERTIFICATE OF COMPETENCY AWARDED

The certificate awarded for each category are as follows:

- IMM Certified Technician in Mechanical Joint Integrity (MJI) for Small-bore Piping, Tubing and Valves
- IMM Certified Technician in Mechanical Joint Integrity (MJI) for Flange Bolted Connections

6. VALIDITY OF CERTIFICATION

5 years; qualified candidate must register as an IMM member for the certification period of 5 years.

7. CANDIDATE'S CRITERIA

Certified Technician in Mechanical Joint Integrity for Small-bore Piping, Tubing and Valves

Candidate should have

- Minimum academic qualification - SPM or equivalent* OR
- Minimum 5 years working experience at site (offshore or onshore plant/construction site) in the instrument and process control discipline, hook-up and construction, and maintenance works using tube benders, cutters and gap inspection gauge AND
- Able to read and understand in English

Certified Technician in Mechanical Joint Integrity for Flange Bolted Connections

Candidate should have

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

*Candidate fulfils the minimum academic qualification without working experience at site (offshore or onshore plant/construction) is considered as candidate without experience.

Candidate without experience is required to attend IMM approved/recognized training courses which prepares and provides comprehensive guidance and practice aligned to the topics covered in the examination.

Candidate with experience is encouraged to attend IMM approved/recognized training courses.

8. RESIT OF EXAMINATION

A candidate who had failed in one or more of the examination parts can apply to re-sit for the failed component(s) of the examination within a year from the date of the last examination. The candidate shall have to pay the full examination fee for the re-sit and without the need to attend any pre-requisite training course.

9. RE-CERTIFICATION

All certified IMM MJI Technicians can apply for re-certification before the expiry of their certification period.

Certified Technician in Mechanical Joint Integrity for Small-bore Piping, Tubing and Valves

6 months prior to the expiry of certification (at the end of the 5th year of certification), the candidate can apply for re-certification for another 3 years by

- sitting for an examination paper;
- providing proof to IMM that he/she has been handling or using tube benders, cutters and gap inspection gauge, as well as hooking up tubing/impulse lines and installing field instruments (testify by project manager or human resource/training/ learning manager of the candidate) for at least 1,000 workhours in the last 5 years*; and
- accumulating sufficient Continuing Professional Development (CPD) points**.

Prior to the expiry of the 3-year re-certification (at the end of the 8th year of certification), the candidate can continue to be certified for a further 3-year period by

- going through the full examination (written paper and practical hands-on); and
- accumulating sufficient CPD points**.

Certified Technician in Mechanical Joint Integrity for Flange Bolted Connections

6 months prior to the expiry of certification (at the end of the 5th year of certification), the candidate can apply for re-certification for another 3 years by

- sitting for an examination paper;
- providing proof 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*; and

- accumulating sufficient Continuing Professional Development (CPD) points**.

Prior to the expiry of the 3-year re-certification (at the end of the 8th year of certification), the candidate can continue to be certified for a further 3-year period by

- going through the full examination (written paper and practical hands-on); and
- accumulating sufficient CPD points**.

The candidate must re-sit the certification examination if he/she has been out of the profession for more than 18 months continuously during the 3-year certification or re-certification period.

** If the candidate failed to provide proof, he/she will be required to undergo a practical hands-on examination.*

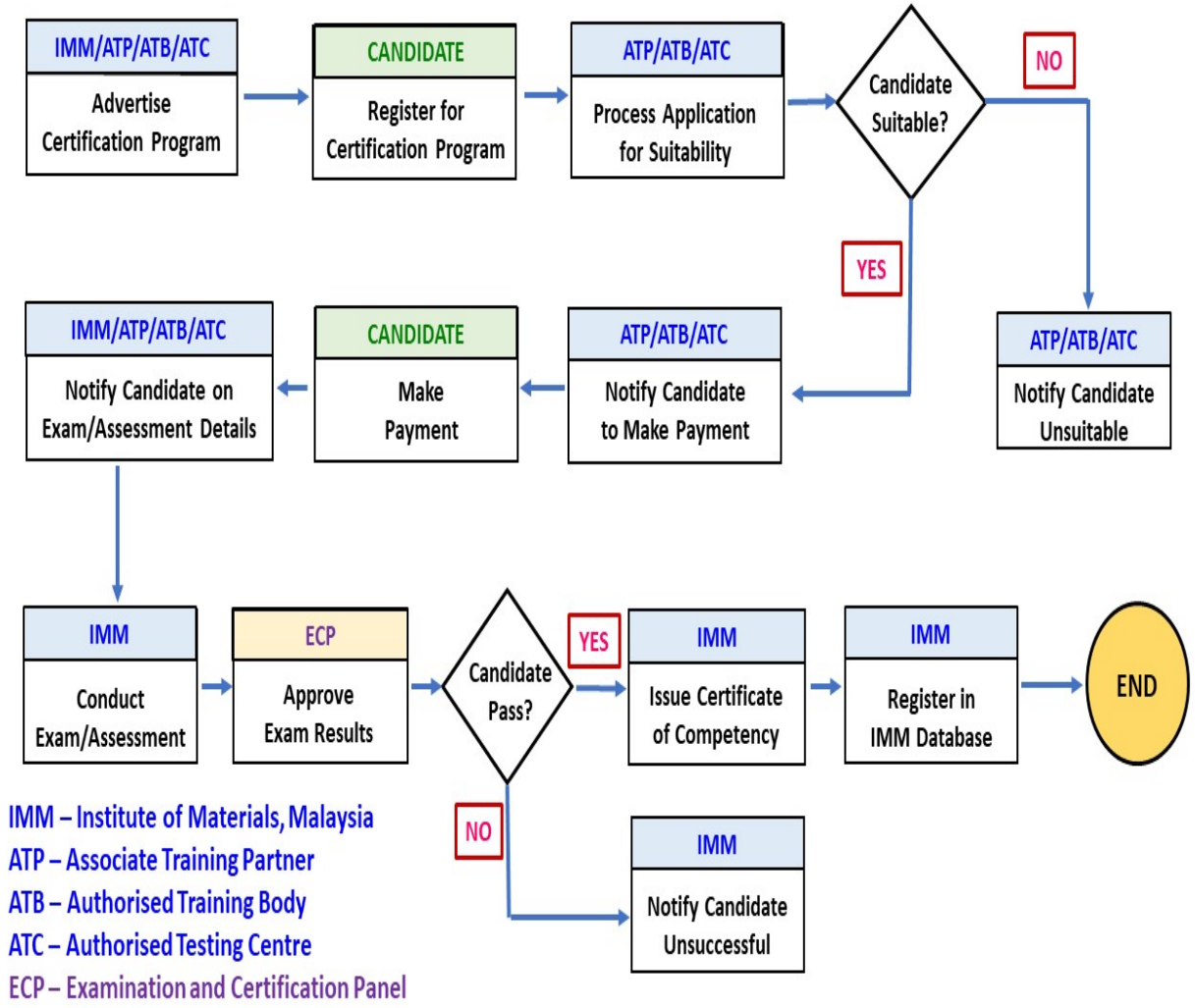
*** The minimum number of CPD points to be accumulated over a 5-year period shall be 100 points with an annual requirement of at least 10 points.*

10. TRAINING

Although this assessment program is intended for only experienced technician, the candidate is strongly encouraged to attend IMM approved/recognized training courses of 3 more days to refresh themselves before attending the examination program by IMM. The IMM approved training courses are conducted by IMM certified trainers through IMM Authorised Training Body (ATB) or Associate Training Partner (ATP). Nevertheless, a prior training program for experienced technician is not compulsory.

The **theory examination and practical assessment** will be conducted by IMM certified trainers/examiners through IMM ATP(s), ATB(s) or ATC(s) throughout Malaysia. Each session will be limited to 20 candidates.

11. FLOW CHART FOR THE CERTIFICATION PROCESS



Note: more details on ATB(s), ATP(s) and ATC(s) can be extracted from IMM website, https://www.iomm.org.my.

12. EXAMINATION TOPICS

The topics for assessment in terms of the knowledge and skills needed by candidate include the following:

Certified Technician in Mechanical Joint Integrity for Small-bore Piping, Tubing and Valves

Supplementary health, safety and environmental knowledge when carrying out the works
Grounding knowledge required to carry out the works, covering;

- Valve types and components, valve packing body-bonnet flange, packing

replacement, inspection and testing
- Small-bore piping, threaded connection, vibration impact, spool replacement, inspection and testing
- Tubing types, compression fittings, measure and bending, tube cutting, assembly and dis-assembly, tubing
- supports, re-make a tube fitting, inspection and repair.
- 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/hook-up drawings
- Preparing a simple work pack if there is no work pack provided for the works
- Planning the works, collecting and storage of materials, correct tools
- Disassembly of valve and packing replacement, small-bore piping, tubing and fittings
- Assembly of the valves, packing, tubing, fittings, small-bore piping and threaded connections
- Post-assembly inspection and testing, and periodic inspection of valves, packing, tubing, fittings, small-bore piping and threaded connections

Certified Technician in Mechanical Joint Integrity for Flange Bolted Connections

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 work pack if there is no work pack 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 and post-assembly inspection and testing
- Periodic inspection

INSTITUTE OF MATERIALS, MALAYSIA

REGISTRATION FORM FOR CERTIFICATION EXAMINATION

* PLEASE COMPLETE THE FORM USING CAPITAL LETTERS

DATE OF APPLICATION : _____

CERTIFICATION SCHEME

SCHEME TITLE : _____ SCHEME CODE : _____

PARTICULARS OF CANDIDATE

PERSONAL INFORMATION

FULL NAME : _____

TITLE : _____ NRIC/PASSPORT NO. : _____

DATE OF BIRTH : _____ AGE : _____

CORRESPONDENCE ADDRESS : _____

_____

MOBILE PHONE NO. : _____ HOUSE PHONE NO. : _____

EMAIL ADDRESS : _____

ACADEMIC QUALIFICATIONS

(Please provide complete information on your education background; additional sheet may be used if needed.)

QUALIFICATION	INSTITUTION	FIELD OF STUDY	GRADUATION YEAR

INFORMATION RELATING TO CURRENT IMM CERTIFICATION (IF ANY)

CERTIFICATION SCHEME : _____

COMPETENCY CERTIFICATE NO. : _____

CURRENT JOB INFORMATION

NAME OF COMPANY : _____

DESIGNATION/POSITION : _____

ADDRESS OF COMPANY : _____

_____

OFFICE PHONE NO. : _____ WORK EMAIL : _____

_____ _____

WORKING EXPERENCE

(Please provide complete information on the employment records in the related field; additional sheet may be used if needed.)

NAME OF COMPANY	POSITION	DURATION	JOB DESCRIPTION

FOR CANDIDATES WITH SPECIAL NEEDS

Do you require any assistance to accommodate your special needs during the examination session?

☐ Yes Please specify the required assistance and reason for the request:

_____

_____

☐ No

IMM MEMBERSHIP APPLICATION

MEMBERSHIP GRADE : ☐ Ordinary ☐ Others (Please specify): _____

SUBSCRIPTION PERIOD : ☐ 5 years ☐ Others (Please specify): _____ years
☐ Current member (Please specify IMM membership no.): _____

Note: Membership subscription will cover period of certification.

SUBMISSION OF SUPPORTING DOCUMENTS

☐ Copy of Identity Card/Passport

☐ Latest curriculum vitae (CV)

☐ Copy of certificate of highest academic qualification

☐ Copy of relevant competency certificate (if any)

☐ Copy of certificate of attendance to any relevant training course(s)

☐ Proof of payment

☐ Original letter from physician/relevant authority (for candidates with special needs)

☐ Others

Please specify : (1) _____

(2) _____

DECLARATION BY CANDIDATE

I, the undersigned, hereby:

☐ declare that, to the best of my knowledge, the information provided on this form is correct and complete and that all documents appended to this form for the submission of my application are genuine and the actual copy of the original documents;

☐ give my permission for my personal data to be processed by the Institute of Materials, Malaysia for personnel, administration and/or management purposes in accordance to the Personal Data Protection Act 2010 (Act 709) under the Laws of Malaysia and for my contact details to be made available to the public if required to due to legal matters upon a formal request by legal personnel;

☐ consent that the Institute of Materials, Malaysia may disclose any information obtained during the certification process, or from sources other than the applicant, candidate or certified person, to an unauthorized party for the purpose deemed necessary by the Institute of Materials, Malaysia and where the law requires such information to be disclosed;

☐ agree and understand that the Institute of Materials, Malaysia does not need to provide prior notification to me when there is a request or inquiry made about the status of my certification;

☐ agree to comply with the certification requirements and to supply any supplementary documents or further information required based on the request made by personnel of the Institute of Materials, Malaysia for assessment purposes; and

☐ understand that the remitted fee is non-refundable if I withdraw after my application has been accepted.

SIGNATURE :

FULL NAME : _____

NRIC/PASSPORT NO. : _____ DATE : _____

FOR OFFICE USE

SUITABILITY CHECKLIST

☐ Highest academic qualification

☐ Work experience in related field

☐ IMM's competency certification or equivalent

☐ Attended training or revision course(s)

DECISION ON SUITABILITY

☐ YES ☐ NO (Please specify:) _____

Examination Date : _____

Examination Venue : _____

Reviewed by (on behalf of ECP), Approved by (on behalf of ECP),

Name : _____ Name : _____

Date : _____ Date : _____

IMM Certification Number : _____

IMM Membership Number : _____

INSTITUTE OF MATERIALS, MALAYSIA

CONTINUING PROFESSIONAL DEVELOPMENT REPORT

NAME: …… YEAR:……

IMM MEMBERSHIP NO:…… CERTIFICATION NO:……

IMM CERTIFICATION:……..

CONTINUING PROFESSIONAL DEVELOPMENT (CPD) LOG
(Supporting documents to be submitted wherever applicable)

Date or Period	Professional Development Activity Code & Description	Role	No. of Activity Hours	Weightage	No. of CPD Points
				TOTAL	

Professional Development Activity Code	Professional Development Activity Scope	Weightage Factor
A	Attend Online or Physical Training Courses/Workshops/Working Sub-Committee Activity on Development of Examinations and/or Training Courses	4
B	Online or Physical Course Trainer/Facilitator/Examiner/Conference Presenter	3
C	Attend Online or Physical Seminar/Conference/Webinar	2
D	Paper Author Main Author (max 30 hours/year) Co-author (max 10 hours/year)	2
E	Attend Online or Physical Committee Meeting	1

CPD Points per year : **10 points minimum**.
CPD Points per 5 year for re-certification : **100 points**.

Year						Total CPD Points
CPD Points						

I hereby declare that the information and particulars provided by me in this form is true and correct.

…… ……..

(Signature) (Date)