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## MMCMP

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# GENERAL REQUIREMENTS FOR THE QUALIFICATION AND ASSESSMENT OF MARINE MACHINERY CONDITION MONITORING PERSONNEL

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## Introduction

This industry standard is a 'privately subscribed standard (PSS)' written and driven by marine personnel in the global marine industry, which includes classification societies, ship owners, ship operators, marine consultants, condition monitoring testing personnel and marine training centres, institutes and colleges. This standard is intended to apply to personnel testing machinery on all classification of ships, from small craft to small ships (<10,000 gross tonnes) up to large ships (≥ 10,000 gross tonnes), and is tailored to suit the needs of the marine industry.

The marine industry has high standards of engineering competence, but personnel may lack adequate training in, and/or understanding of condition monitoring (CM) techniques and the diagnostics of accumulated data.

This industry PSS standard specifies a qualification for Marine Machinery Condition Monitoring Personnel (MMCMP), providing a three-category classification of competence for general, advanced and specialist levels, respectively. The competencies are specified in Appendix A while this document provides the general requirements for the qualification of marine personnel to this industry standard.

In general, conformity assessment to this industry PSS standard may be awarded by certification from a 3<sup>rd</sup> party certifying body conforming to ISO/IEC 17024, or awarded by declaration from a 2<sup>nd</sup> party assessing body conforming to ISO/IEC 17050, providing the condition monitoring technical components of this qualification conform to the relevant technical parts of ISO18436 or other specification documents defined in clause 6.2. If the qualification is to be awarded by an independent third party certification body, then that body shall conform to ISO/IEC 17024 and demonstrate its compliance. These bodies are collectively regarded as 'qualifying bodies'.

The training modules specified in Appendix A may be provided by any training body that conforms to the training requirements outlined in Annex A of that document. Annex C within Appendix A is an informative list of approved training providers recommended by the committee producing this industry standard.

This industry PSS standard provides the general requirements and specifications for the qualification and associated prerequisite competencies for each classification, together with guidance on any additional examination and/or training that may be required. When all prerequisite competencies have been acquired and documentary evidence provided to the qualifying body, then a MMCM qualification will be awarded indicating conformity to this industry standard.

The intent of this marine industry sector is to make this PSS available to all qualifying bodies in all global regions, to consider for adoption and adaption to their regional qualification of maritime personnel. Adoption of this PSS across regions will harmonise and standardise the qualification and certification of marine CM personnel who evaluate the condition and worthiness of ships at sea. This harmonisation will occur when all regional bodies adopting this PSS specify the same portfolio of required qualifications and competencies for each level defined in Appendix A of this document. With harmonisation all certificated personnel will have a transferable qualification accepted across regional boundaries in the maritime sector.

This PSS also accommodates the assessment format for learning outcomes that are specified by the UK Merchant Navy Training Board.

This document and its appendix are adopted by BINDT as the UK marine industries elected qualifying and certifying body.

## 1. Scope

- 1.1. This document describes a system for the qualification of personnel involved in marine machinery condition monitoring.
- 1.2. The scope will include condition monitoring methods and analysis of data from multiple methods, marine technology and terminology and health and safety in a marine environment at the appropriate level.
- 1.3. The qualification and certification of personnel in this programme is based on a specified portfolio of qualifications and competencies defined in Appendix A of this document.

## 2. References

The most recent version published applies, if not specified.

ISO/IEC 17024.	Conformity assessment. General requirements for bodies operating certification of persons
ISO/IEC 17050-1:	Conformity assessment. Supplier's declaration of conformity. Part 1. General requirements.
ISO 18436.	Condition monitoring and diagnostics of machines. Requirements for qualification and assessment of personnel. Part 1- certifying bodies; part 2- vibration monitoring; part 3- training bodies; part 4- field lubricant analyst; part 5- laboratory lubricant analyst; part 6- acoustic emission and part 7- thermography (for AE, VA, IRT and LM methods at levels 1, 2 and 3)
IAEA-TECDOC-628/Rev.1:	Training guidelines in non destructive testing techniques (for AE, VA, IRT methods at level 1 only)
EN473:	Non-destructive testing. Qualification and certification of NDT personnel: General principles (for AE and IRT methods at level 1 only)
ISO 9712:	Non-destructive testing: Qualification and certification of personnel (for AE, VA and IRT methods at level 1 only)
SNT-TC-1A:	Recommended practice- Personnel qualification and certification in non destructive testing (for AE, VA and IRT at level 1 only)
CMGEN:	General requirements for qualification and PCN certification of condition monitoring and diagnostics personnel, and associated appendices (App A- acoustic emission; App B- thermography; App C- lubrication management; App D-vibration analysis) (for AE, VA, IRT and LM methods at levels 1, 2 and 3)
MNTB: 2006	MNTB National Occupational Standards
STCW-95	The International Maritime Organization [IMO] Standards for Training and Certification of Watchkeepers

## 3. Terms and Definitions.

For the purposes of this document, the terms and definitions within ISO18436, EN473, ISO17024 and CMGEN apply, with the added definitions provided for clarity:

- 3.1 Accredited Training Organisation (ATO) - competent organisation accredited by the certifying body to provide training of personnel in CM
- 3.2 Approved training body (marine institute or centre)- a competent training organisation approved to provide marine-based qualification courses that are prerequisite competencies leading to an award of qualification that conforms to this industry standard
- 3.3 Assessing body- a 2<sup>nd</sup> party qualifying body that issues declarations of conformity to a specified technical standard, where this body is defined in ISO/IEC 17050.
- 3.4 Certifying body- a 3<sup>rd</sup> party qualifying body that issues certificates of conformity to a specified technical standard, where this body is defined in ISO/IEC 17024.
- 3.5 Certification – an award issued by a 3<sup>rd</sup> party certifying body to demonstrate that the candidate conforms to this industry standard.
- 3.6 Competence - The demonstrated ability to apply knowledge and skills.

- 3.7 Declaration- an award issued by a 2<sup>nd</sup> party assessing body to demonstrate that the candidate conforms to this industry standard
- 3.8 PSS- Privately Subscribed Standard. A sector driven and subscribed standard that provides the technical solutions for that sector, before it is ratified by consensus by the overall international community (ISO). A PSS is an accepted form of standard approved by BSI, CEN/CENELEC and ISO/IEC. It may be adopted and approved by the national standards body and become a 'Publicly Available Specification PAS', then achieve international consensus approval (ISO/PAS) or develop to a full consensus standard (ISO or CEN).
- 3.9 Re-certification - The procedure for revalidation of a certificate through assessment or examination in a 3<sup>rd</sup> party certifying process.
- 3.10 Renewal - The procedure for revalidation of certification or declaration without examination.
- 3.11 Significant Interruption – A *significant interruption* means an absence from (or a change of) work activity which prevents the holder of the qualification from practicing the duties corresponding to his or her level for which qualification was issued, for (a) a continuous period in excess of one year or (b) two or more periods for a total time exceeding two years
- NOTE: Legal holidays, or periods of sickness or courses of less than thirty days are not taken into account when calculating the interruption.
- 3.12 Qualifying body- is a general term that applies to either a certifying body in a 3<sup>rd</sup> party certification process or an assessing body in a 2<sup>nd</sup> party declaration process, where 2<sup>nd</sup> and 3<sup>rd</sup> party processes are defined in ISO/IEC 17050.

#### 4. Abbreviations

The abbreviations used within this industry standard include:

MMCMP	Marine Machinery condition monitoring Personnel
CM	Condition Monitoring
AE	Acoustic Emission
VA	Vibration Analysis
IRT	Infrared Thermography
LM	Lubrication management (tribology [oil analysis] and lubricant management)
PSS	privately Subscribed Standard

#### 5 General principles

- 5.1 Duties and responsibilities
- 5.1.1 The employer:
- 5.1.1.1 confirms the validity of any personal information provided, including the declaration of education, training and experience required for the eligibility of the candidate;
- 5.1.1.2 cannot be directly involved in the qualification process;
- 5.1.1.3 is responsible for:
- issuing the operating authorisation;
  - verification of the continuity in the application of the test methods without significant interruption.
- 5.1.2 Candidates for qualification may be self employed or unemployed so long as they provide documentary evidence that experience has been gained under the supervision of suitably qualified personnel.
- 5.1.3 A self-employed candidate shall assume all of the responsibilities described for the employer.

- 5.2 Levels of certification available
  - 5.2.1 Level 1 [General-Marine Machinery Condition Monitoring: MMCM-Level 1 general]
  - 5.2.2 Level 2 [Advanced- Marine Machinery Condition Monitoring: MMCM-Level 2-advanced]
  - 5.2.3 Level 3 [Specialist- Marine Machinery Condition Monitoring: MMCM Level 3-Specialist]

## **6 Eligibility**

### **6.1 Eligibility for Qualification**

- 6.1.1 To be eligible for qualification that conforms to this industry PSS standard the candidate shall provide satisfactory documentary evidence of acquisition of each competency listed for the relevant level defined in Appendix A.
- 6.1.2 Qualifications from approved marine training bodies and other assessing bodies that conform to this industry standard are also accepted. If any competency is missing from a candidate's portfolio then additional training and qualification would be required.
- 6.1.3 Upon submission of documentary evidence of all required competencies to the qualifying body, with appropriate verification by an appointed examiner and with the payment of any required qualification fee to the qualifying body, the candidate shall be awarded a qualification indicating conformity to this industry standard.
- 6.1.4 The eligibility and requirements for training in any marine-based competency is defined in documents such as STCW-95 and any training body complying with this marine standard will be deemed as providing the required training for marine-based competencies.

### **6.2 Eligibility for Examination**

Training, conduct of examinations, grading of examinations, re-examination, renewal and recertification for the four approved condition monitoring technologies, vibration analysis (VA), acoustic emission (AE), lubrication management (LM) and infrared thermography (IRT) are specified in the ISO 18436 suite of standards, however, at level 1 only, qualification in these methods that conform to EN473, ISO9712, SNT-TC-1A or IAEA-628, where applicable, are accepted as meeting the level 1 testing competency module as defined in Annex A of Appendix A of this industry Standard. They are not accepted at levels 2 and 3 as they do not provide training in CM specific competencies that are specified in ISO18436.

## **7. Publication of Qualification Results**

The result notice and award (declaration or certificate) for this qualification will be sent to the candidate at the address given on the standard application form, normally within 21 working days of submission of all required documentary evidence of prerequisite competencies for the relevant level, to the qualifying body, provided all qualification fees have been paid.

## **8. Validity of Qualification**

The maximum period of validity of a MMCM award (certificate or declaration) is five years from the date of first issuance of the award.

The award of qualification shall be invalid:

- 8.1 if not signed by the holder;
- 8.2 at the option of the qualifying body after reviewing evidence of unethical behaviour defined by a specified code of ethics;

- 8.3 if a *significant interruption* takes place in the application of the competence for which the individual is qualified;
- 8.4 from the date of issue of notification of failure in any examination required for renewal or re-certification (or re-declaration).

## **9. Renewal and re-certification (or re-declaration)**

- 9.1 Five years after success in a MMCM qualification the holder may renew his award of qualification (certificate or declaration) for a further period of five years upon submission of satisfactory documentary evidence of continuity, without significant interruption, in the application of the relevant competence.
- 9.2 Applications for renewal or re-certification (or re-declaration) may be made at any time within the period of validity of the award but, to ensure continuity of the qualification, it is advisable to apply at least 56 days prior to expiry.
- 9.3 Applications for renewal or re-certification (or re-declaration) after the award of qualification has expired may be considered for up to one year after expiry, but such applications will be subject to payment of an additional non-refundable administration fee.
- 9.4 If the criteria for renewal and/or re-certification (or re-declaration) are not met, the qualifying body will immediately cancel the award of qualification. To regain the relevant award the individual will need to successfully complete the process for initial qualification.
- 9.5 Five years after renewal, in order to revalidate the award of qualification for a further five-year period, the holder will provide satisfactory documentary evidence of continuation training, satisfy the criteria for renewal, and achieve success in an abbreviated written examination provided by an approved marine training body covering selected competencies defined for the qualification.
- 9.6 Renewal and re-certification (or re-declaration) for CM testing qualifications at level 1 will be in accordance with procedures defined by the applicable standard (EN473, ISO18436, ISO9712) or specification of recommended practice (IAEA-628, SNT-TC-1A).
- 9.7 Renewal and re-certification (or re-declaration) for CM testing qualifications at levels 2 and 3 will be in accordance with procedures defined by ISO18436.

## **10. Complaints and Appeals**

- 10.1 Award holders must recognise that personal integrity and professional competence are the fundamental principles on which their activities are founded. Accordingly, it is a condition of the qualifying body that award holders shall comply with a code of ethics commensurate with those specified in EN473, ISO9712 and/or ISO18436. This undertaking is given at the time of submitting an application for qualification that conforms to this industry standard.
- 10.2 An aggrieved party in a dispute, which considers itself to have reasonable grounds for questioning the competency or ethical behaviour of an individual qualified in accordance with this industry standard, may petition the relevant qualifying body for cancellation of the award of qualification in question. Such a petition must be accompanied by all relevant facts and, if it is the view of the qualifying body that an adequate case has been presented, the award will be suspended and a full investigation of the circumstances under dispute will be initiated.
- 10.3 If the petition is substantiated to the satisfaction of the qualifying body's management process, then the award may be cancelled, or renewal or re-certification (or re-declaration) may be refused, for such period as may be decide.

- 10.4 The candidate or the employer, upon application in writing, may make appeals against cancellation of the award, failure to certify or declare, or failure to renew, to the awarding body, which may delegate the process of dealing with complaints and appeals to a properly constituted committee.

## 11. Qualification Records

- 11.1 The qualifying body will retain records relating to qualification of personnel for a minimum period of 11 years.
- 11.2 An updated database of qualified personnel, which includes (amongst other things) the name, unique identification number and scope of qualification held by each individual, is to be maintained by the Records Office of the Qualifying body.
- 11.3 Audit of specific individual qualification records, which are under the jurisdiction of the qualifying body, may be permitted at the discretion of the qualifying body, under certain circumstances.

## 12. Use and Misuse of Awards of Qualification

- 12.1 The issue of an award of qualification (certificate or declaration) indicates that the holder has demonstrated an acceptable level of competence commensurate with this industry standard. Holders or employers are not permitted to imply any further degree of competence on the basis of the award.
- 12.2 Certificate or declaration holders or their employers must not use or refer to these awards, the qualifying body's logo, nor must they knowingly allow them to be used or referred to by a third party, in a manner that may be considered fraudulent or to bring the qualification process into disrepute.
- 12.3 All qualified personnel are required to keep a register of complaints made against them within the scope of the competence in question. Failure to keep such a register or failure to enter valid complaints in it will be construed as a misuse of the certificate or declaration and appropriate penalties will be applied. The register of complaints must be made available to the relevant qualifying body on request.
- 12.4 The penalty for misuse of certification or declaration awards in all cases is invalidation of the award. If the misuse was in the public domain, publication of the transgression may also be undertaken. Any misuse that appears to be an infringement of the law will result in the matter being reported to the legal authorities in the country concerned.
- 12.5 Awards of Qualification are valuable documents, which should be kept in a safe place. Any suspicion of forgery or misrepresentation must be reported to the qualifying body. Loss or theft of such documents must be reported to the legal authorities in the country concerned and to the relevant qualifying body.
- 12.6 It is required that all award holders maintain records demonstrating continuity in the application of the competence for which they are qualified.
- 12.7 New employers presented with MMCM certification or declarations should satisfy themselves that the award holder has been employed without *significant interruption* on work for which the award was granted. It is strongly recommended that the employer request sight of the award holder's record of continuity and validity of the award by conferring with the relevant qualifying body, either directly or via their registered website.