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## CP08-CM ISSUE 4 DATED 1<sup>ST</sup> January 2022

### APPROVAL OF CONDITION MONITORING TRAINING ORGANISATIONS

#### IMPLEMENTATION DATE: 1<sup>st</sup> January 2022

##### Foreword

This document details the process and requirements for the validation of courses and BINDT approval of training organisations providing training in the field of Condition Monitoring. This document was formerly known as the "Approval of Condition Monitoring Training Organisations" Document but is now designated CP08-CM (Approval of Condition Monitoring Training Organisations).

**BINDT has allowed a transition period of 6 months to conform to this document and you will be audited against these requirements at your next audit, unless your audit is dated before the implementation date. You may choose to be audited against this version early, in which case you shall advise your appointed assessor when audit dates are arranged.**

Any enquiries should be forwarded to the BINDT ATO administration department at:

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## **Definitions**

**Approved Training Organisation:** A commercial provider of Condition Monitoring training for personnel, whether they be seeking PCN certification or not, that has submitted its courses to BINDT for validation and has successfully undergone assessment to confirm conformance with the requirements detailed within this document.

**Counselling:** Extra tuition or advice delivered to a student with the aim of improving knowledge, skills or understanding

**Curriculum:** A documented description of the skills, performances, attitudes, and values students are expected to learn from participation in the validated training course. It includes statements of desired pupil outcomes, descriptions of materials, and the planned sequence that will be used to help pupils attain the outcomes.

**Formal Qualification Examination:** An examination administered, following the successful completion of training, in accordance with the requirements of a Certification Body (e.g. PCN or other ISO 18436 schemes) or for and on behalf of a commercial client (e.g. SNT-TC-1A, EN 4179, NAS 410)

**Requirement:** Expression conveying criteria to be fulfilled if compliance with the document is to be claimed and from which no deviation is permitted. The use of the modal verb 'shall' denotes a requirement that is mandatory whenever the criterion for conformance with the specification requires that there be no deviation.

**Recommendation:** Expression conveying that among several possibilities one is recommended as particularly suitable, without mentioning or excluding others, or that a certain course of action is preferred but not necessarily required, or that (in the negative form) a certain possibility or course of action is deprecated but not prohibited. The use of the modal verb 'should' denotes a guideline or recommendation whenever noncompliance with the specification is permissible.

**Statement:** Expression conveying information

**Remote Training Centre:** A location where an ATO conducts BINDT validated training courses. Up to five (5) courses may be conducted at a particular RTC in any twelve (12) month period. However, if it is intended that six (6) or more courses are to be conducted in any twelve-month period, then the RTC shall be considered by BINDT to be an ATO and shall apply for and gain ATO status in its own right.

**Training Certificate:** Document issued after a person completes a training course, or a series of training courses, and passes an assessment that measures the intended learning outcomes of the specific course or courses

## **Abbreviations**

**AE:** Acoustic Emission

**ATO:** Approved Training Organisation

**BINDT:** British Institute of Non-destructive Testing

**CM:** Condition Monitoring

**IRT:** Infrared Thermography

**LMA:** Lubrication Management and Analysis).

**QMS:** Quality Management System

**RTC:** Remote Training Centre

**VA:** Vibration Analysis

## **1. Introduction**

- 1.1.** In the interests of improving and maintaining the general standard of Condition Monitoring (CM) training, the British Institute of Non-Destructive Testing has produced guidelines which define the minimum requirements for the structured training of CM personnel together with a scheme outlined herein under which such training is be assessed and approved. These requirements conform to those specified in PCN document CM/GEN and ISO 18436 part 3 (requirements for training bodies and the training process) for 3<sup>rd</sup> party conformity assessment. It is the intention that the gaining of approval by a commercial trainer offering courses to external clients should be seen as a testimony to the quality of its overall system of training, declaration of conformity to this document, ISO 9001, CM/GEN and relevant parts of ISO 18436.
- 1.2.** All information and documentation accrued by the appointed agent, the Approval Panel and any external assessor whilst conducting Approval or accreditation business shall be treated as commercial in confidence and not disclosed to any other parties and appropriately secured for storage.
- 1.3.** A system diagram, which outlines the approval process, is shown at Figure 1.
- 1.4.** This document is to be used by Organisations wishing to provide Industry with an assured quality of training in condition monitoring. It has been developed out of a need for a method by which approval can be given to those offering excellence in training.
- 1.5.** The requirements for Approved Training Organisations are elaborated throughout this document and are indicated by the use of the modal verb 'shall'. Current and prospective BINDT CM ATOs shall comply with the minimum requirements within 6 months of the date of publication of this initial issue of CP08-CM.
- 1.6.** It is a recommendation of ISO 18436-3 that certification bodies make use of approved training bodies when stipulating their requirements for qualification examination eligibility.

## **2. Minimum Requirements for the Structured Training of Condition Monitoring Practitioners**

### **2.1. Scope**

- 2.1.1.** This document has been prepared under the direction of the Membership, Qualifications and Education (MQ&E) Committee of the British Institute of Non-Destructive Testing for training Organisations wishing to provide industry with an assured quality of training in CM methods.
- 2.1.2.** The document establishes the minimum requirements for the structured training of CM personnel to ensure eligibility in CM personnel certification examinations.

### **2.2. Training availability**

- 2.2.1.** The PCN condition monitoring scheme pertains to four CM technologies: IRT (infrared thermography), VA (vibration analysis), AE (acoustic emission) and LM (lubrication management and analysis).
- 2.2.2.** The training shall be in the form of lectures (with self-study in part allowed, constituting no more than 50% of course content of generic knowledge, as directed by the ATO), demonstrations and practical exercises. The practical skills exercises for category 1 trainees only, will be evaluated by the trainer against evaluation exercises similar to those given as an example (For LM category 1) in Appendix 3.
- 2.2.3.** It is recommended that successful completion of the practical skills evaluation be declared upon the training declaration [see clause 2.3]. With regard to completion of the self-study component, the ATO will be required to give a short assessment to verify candidates understanding of the self-study material. The training syllabus and consequent attestation available at category 1 is of a general 'introduction' nature, as specified in CM/GEN. IRT however, because of its diversity across many sectors, offers a modular format for training at categories 2 and 3, these modules will be:
  - IRT-Electrical
  - IRT-Mechanical
  - IRT-Civil

- 2.2.4. Candidates for IRT categories 2 and 3 will be required to train in the compulsory general subjects and at least one elected module. The candidate selects a module consistent with the industry to which he is employed or wishes to be employed. The 'declaration of training' will therefore reflect the module chosen.
- 2.2.5. All ATOs offering IRT training at categories 2 and 3 must be organised and appropriately qualified to facilitate this modular training structure for IRT candidates.
- 2.2.6. All condition monitoring approved training centres functioning as a 2<sup>nd</sup> party body that is registered with a 3<sup>rd</sup> party certifying body like BINDT, are authorised only to issue 'declarations of conformity' or 'training certificates' for their training courses [see below].

### **2.3. Conformity to ISO18436**

- 2.3.1. Conformity to a standard can be assessed in various ways as described in ISO/IEC 17024 and ISO/IEC 17050. Practitioners of machine condition monitoring and diagnostics can seek "certification" by an independent third-party certification body which itself is able to demonstrate its compliance with ISO/IEC 17024. This conformity assessment is used by BINDT for the PCN certificates. That is, in accordance with the relevant definitions given in ISO/IEC 17000 and ISO/IEC TS 17027, the terms "certify," "certification" and "certified" are used to describe only the issuance of an attestation document by an independent third-party certification body.
- 2.3.2. The terms "declare" "declaration" and "declared" appropriately qualified, are used to identify the issuance of an attestation document by any Body other than an independent third-party certification body. Therefore the attestation of success of a candidate from a 2<sup>nd</sup> party training body must be in the form of a 'declaration of conformity'.
- 2.3.3. The term "training certificate" may be also used by BINDT Approved ATO's as the title for their form successful completion of training 'declaration of conformity'.

### **2.4. Quality Management System**

- 2.4.1. The Training Organisation shall implement and maintain a fully documented Quality Management System which conforms to ISO 9001 and/or AS 9100. Certification to ISO9001 is preferred but not mandatory for CM ATO's. Where the ATO QMS is certified, and in order to be acceptable to BINDT, the certification must be issued by a body holding ISO 17021 approval granted by a National accreditation body affiliated with the International Accreditation Forum (IAF). Where the CM Training operations form a department/division within a larger Organisation, BINDT expects the QMS of the larger Organisation to be approved and for the Training department to operate within that system.
- 2.4.2. The QMS shall comprise of documented systems compliant with the current edition of ISO 9001. Training Organisations should be aware that although the 2015 version of ISO9001 has removed the requirement for some mandatory documents (including a quality manual) BINDT will still expect Training Organisations to have suitable documented systems (Manuals procedures, work Instructions etc.), processes and records to enable the BINDT assessment program to be able to confirm compliance with the requirements of this document. Documented procedures shall cover quality management and training realisation processes. The management system shall be controlled and periodically reviewed according to the stipulations in the Organisation's QMS.

*NOTE: An exclusion may be declared for design and development - as the training syllabus and methodology is externally imposed*

- 2.4.3. All staff within the applicant Training Organisation shall be made aware of their specific responsibilities and method of working, which shall be defined by a documented job description for each position within the organisation. Job Descriptions shall also determine the competence requirements for the appointment.
- 2.4.4. The quality manual or training department's documentation shall include an organisational chart detailing the all key roles within the training structure. Staff shall be allocated job titles in their terms of reference or letters of appointment, which in turn refer them to the Quality Manual and Job Descriptions. The Organisation shall retain documented evidence of personnel acceptance of assigned roles and responsibilities.

- 2.4.5. The Training Organisation shall have a documented process whereby all staff sign a record to confirm that they have read, understood and are conversant with the QMS and applicable quality/training related documents (however defined). This shall apply to existing, newly drafted or revised documents relevant to their position within the organisation.
- 2.4.6. The ATO quality management system shall include a documented schedule for internal audit which will cover the whole of the quality management system and training processes (including RTCs where applicable) at least once in each calendar year. The internal audit program may consist of a series of audits addressing individual aspects of the QMS and training process or may consist of a single audit that encompasses all aspects of the QMS and training process.
- 2.4.7. The ATO shall implement a documented process for Management Review and student feedback review and analysis. Reviews of completed trainee feedback forms are to be part of the review and improvement process. Where the CM Training operations form a department/division within a larger Organisation, BINDT expects the Training department to conduct and document management review in respect of the Training process and performance. This Departmental Management Review must address the inputs and outputs mandated by ISO9001 especially in relation to review of effectiveness of the QMS and monitoring, measurement and analysis.
- 2.4.8. The ATO shall provide BINDT with a documented Quality Management System (QMS). The English version of the QMS shall be submitted to BINDT electronically and controlled by the ATO. When the QMS undergoes any revision, or when new quality documents are issued, these shall also be promptly submitted to BINDT in soft copy form.
- 2.4.9. BINDT shall implement a process to deal with complaints from students and/or employers of students, and ATO status may be suspended or withdrawn at any time if, upon investigation, non-conformances are judged by the Approval Panel to warrant it.
- 2.4.10. A system to record any complaints received shall be operated by the Training Organisation and complaint records shall be available for review during BINDT audit(s).
- 2.4.11. Should major changes occur in Approved Training Organisation policy, personnel, documentation, facilities or operating procedure, which may affect the validity of approval, the British Institute of Non-Destructive Testing shall be informed, immediately. Failure to do so may result in suspension or withdrawal of approval, or a refusal to renew approval.

## **2.5. Management Responsibility**

- 2.5.1 The ATO shall appoint a Training Co-ordinator who is responsible for the overall management of the training operations. The ATO shall also designate responsible persons (however named) for the setting up and maintaining a Documented Quality Management System satisfying the criteria contained within ISO 9001, ISO18436-1, ISO 18436-3 and this document.
- 2.5.2 In respect of training processes the ultimate responsibility for ensuring the existence of a documented system that meets the requirements of this document shall remain with the Training Co-ordinator.
- 2.5.3 Top Management must be involved with and show commitment to the successful operation of the Quality Management system.
- 2.5.4 A Quality Policy must be established which is relevant to the Organisation and to its customers and should include objectives.
- 2.5.5 Measurable objectives for the business (training process) need establishing to help achieve the aims of the Quality Policy.
- 2.5.6 Top management shall assign responsibilities and must promote the need for both internal and external communications

## **2.6 Resource Management**

ATO management shall:

- 2.6.1 Determine the necessary competence for personnel performing work affecting the quality of CM training (as specified in ISO 18436-3 and CM/GEN).
- 2.6.2 Provide training or take other actions to satisfy the competence needs of Training staff.
- 2.6.3 Periodically evaluate (minimum – every 2 years) the teaching competence of all authorised trainers listed on the ATO scope.
- 2.6.4 Ensure the adequacy of equipment and facilities needed by the business to carry out CM Training in the methods for which it is approved, or seeking approval.
- 2.6.5 Ensure that the working and training environment meets Statutory, Regulatory, BINDT and Customer requirements.
- 2.6.6 Take all adequate safety precautions to protect staff and trainees/students. If in the opinion of the appointed lead assessor the organisation has failed to take adequate precautions, BINDT reserves the right to withhold or suspend ATO status until it is satisfied that the unsafe situation has been redressed.

## **2.7 Service Realisation**

- 2.7.1 ATO management shall plan service realisation from the point where the customer applies for training through to delivery (award) of a certificate of successful completion of training. In so doing, management shall identify key processes and how these processes interact with one another.

## **2.8 Measurement, Analysis and Improvement**

- 2.8.1 In addition to the requirements of ISO 9001, ATO management shall:
  - 2.8.1.1 Evaluate processes associated with the delivery of training, ensuring that it is delivered in an effective manner which meets the customer's requirements.
  - 2.8.1.2 Monitor and measure customer and/or student satisfaction
  - 2.8.1.3 Commission internal audits at not less than 12 month intervals.
  - 2.8.1.4 Ensure that any identified Non-Conformances are controlled, investigated and resolved in an appropriate manner.
- 2.8.2 The above activities will provide data which shall be collated and analysed in order to identify trends and/or improvements to management systems and processes.
- 2.8.3 ATO management shall implement and monitor improvements, reporting the status of improvement strategies at Management Review.

## **2.9 Student Advance Information**

- 2.9.1 A system for the provision of advance information shall be in place such that, upon acceptance of an application for enrolment, the ATO shall issue to the enrolled student, or his sponsor, clear and unambiguous instructions in accordance with the following:
  - 2.9.1.1 Course fees and method of payment which shall show all that is included in the fees. There shall be no *hidden extras* and a schedule of course fees shall be made freely available *upon request*.
  - 2.9.1.2 Dates and times of attendance for the course, which shall include clear instructions concerning the location of the training venue (ATO or RTC).

- 2.9.1.3 Transport, accommodation and catering arrangements, where applicable.
- 2.9.1.4 The relevant safety requirements pertaining to the ATO as a whole or the particular course for which the student is enrolled.
- 2.9.1.5 Personal Protective Equipment (PPE) required for students attending the training course, and whether this is provided by the ATO, or whether the student must provide his/her own PPE.
- 2.9.1.6 Equipment provided by the ATO for use by students during the training course, and whether the student may optionally provide/use their own equipment.
- 2.9.1.7 Textbooks essential to the training course, and whether these are provided by the ATO or the student.
- 2.9.1.8 The name and telephone number of a contact at the ATO from whom additional information may be obtained if required.

## **2.10 Student Assessment**

- 2.10.1 In all cases a system of controlled, documented student assessment shall monitor and record the progress and learning of individual students on a daily basis, measuring the assimilation of knowledge and skills through assessments, delivering mandatory counselling to students who fail to meet established performance indicators (see section 2.11 below). To facilitate the above, the ATO shall establish and document performance indicator(s) or benchmark(s) to be met by the student as evidence of his or her successful completion of an individual training module or acceptable progress towards successful completion of the full training course.
- 2.10.2 Successful completion of a training course shall be determined by students having to achieve a minimum pass mark of 75% (70% for LA & VA only) in theoretical assessments (tests) that demonstrate satisfactory learning of the course material. Successful completion may be adjudged via an end of course test or a series of modular tests conducted throughout the course or a combination of both. Where the modular test results are used the overall score shall be calculated by adding up responses to all modular test questions to formulate an overall percentage. In all cases the required overall pass mark is 75% (70% for LA & VA only) – note students may score below the required pass mark on individual modular tests providing the overall score exceeds the minimum requirement. Students failing individual modules shall be subject to the mandatory counselling process.
- 2.10.3 Successful students shall be issued with a uniquely numbered ‘training certificate’ clearly indicating successful completion of training (traceable to the student records required in paragraph 2.21). This ‘training certificate’ is verification of the eligibility requirement specified in CM/GEN for condition monitoring certification, prior to acceptance to undertake a qualification examination. Students failing a final course assessment/test are permitted a second attempt following extra tuition/counselling. The second attempt must use different test papers and materials from those used in the initial attempt.
- 2.10.4 Modular tests and end of course assessments (tests) shall be prepared by the ATO and shall not include materials reserved and approved for formal qualification examinations. End of course assessments/tests shall not be confused with the formal qualification examinations following completion of the training course – see 2.10.5 below. End of course assessments (tests) do not negate the ATO’s obligation to conduct and record the daily progress of students as detailed in 2.10.1 above.
- 2.10.5 End of course assessments/tests and documented modular tests (see 2.10.3) shall be administered under examination conditions. Steps shall be taken to prevent collaboration or collusion during end of course assessments and formal examinations. ISO 18436-3 allows the trainer to invigilate and score the end of training assessment test, but under no circumstance can a trainer be associated with a qualification-certification examination (see ISO 17024 and ISO 18436-1).

## **2.11 Formal Examinations**

- 2.11.1 Whenever, following the successful completion of training, end of course formal qualification examinations are administered the following clauses shall apply.
- 2.11.2 For PCN CM Examinations BINDT is the recognised Authorised Qualifying Body under ISO 17024. BINDT Approved CM ATO's are automatically approved as Approved Examination Centres (AEC) and the ATO audits conducted by BINDT shall encompass a review of the examination arrangements.
- 2.11.3 For PCN examinations, the examination papers shall be provided directly by PCN under secure arrangements. PCN examinations may only be invigilated by persons authorised and/or appointed by PCN/BINDT.
- 2.11.4 For all examinations steps shall be taken to prevent collaboration or collusion during the examinations. A documented system shall be in place to ensure that any materials used during formal qualification examinations have not been accessible (or been used) to the student during the training course.
- 2.11.5 The ATO/AEC will ensure that the examination conditions provided are conducive to the conduct of PCN examinations. The ATO/AEC shall conduct site audits to assess that the following are of an acceptable standard and conducive to the administering of examinations :
  - The examination room
  - Adequate lighting
  - There are sufficient examination desks available, spaced no less than 1 metre apart
  - A clock or timer is available and visible by the invigilator and candidates
  - Drinking facility for candidates and invigilator
  - Toilet facilities
  - A waiting area for candidates
  - Relevant signage if appropriate

## **2.12 Counselling**

- 2.12.1 A system of counselling shall be provided for the benefit of students who fail to reach the required minimum standard during daily progress assessments or in the end of course assessment.
- 2.12.2 Where counselling or extra tuition is deemed necessary, the ATO shall retain records of the delivery of counselling and a determination as to whether the underperforming student has been elevated to an acceptable level. See 2.10.1 and 2.10.2 above regarding mandatory counselling for students failing to meet established benchmark criteria in daily progress assessments.

## **2.13 Curriculum**

- 2.13.1 The Training Organisation shall publish and make freely available upon request the curriculum upon which each course is based. The course concerned must be aligned with the BINDT certification examination (as defined in PCN CM/GEN), and the curriculum must reflect any published syllabus pertaining to that examination; the curriculum shall be reviewed annually (as a minimum) and revised in accordance with the current revision of PCN CM/GEN, and must identify any associated RTCs.
- 2.13.2 The curriculum shall be reviewed and revised, if necessary, in the light of scientific, industrial and technological developments in the CM method concerned, or where a change occurs in the syllabus of the certification body's qualification with which the course is aligned. The ATO shall have a documented process that records the conduct and outcomes of periodic reviews

## **2.14 Course Notes/Materials**

- 2.14.1 The Training Organisation shall maintain a master set of course notes and shall review these and revise them, if necessary, in the light of changes to the Certification Body's published training and examinations syllabus. The ATO shall have a documented process that records the conduct and outcomes of periodic reviews.
- 2.14.2 Revised course notes shall bear a revision date, to ensure a consistency between courses in the event of staff changes. The ATO shall have a documented process that records the conduct and outcomes of reviews.
- 2.14.3 The Training Organisation shall provide each enrolled student with a comprehensive set of appropriate course notes, these being hard copies of the master, the cost of which shall be included in the course fees.  
*NOTE: Externally published and controlled classroom training handbooks may supplement but not be a substitute for the Training Organisation's own course notes.*
- 2.14.4 The Training Organisation shall provide a set of course notes to BINDT for each CM technique and Category being offered for validation purposes, these may be either hard copy or a pdf of the master. Following any significant change or modification, the ATO shall provide updated copies to BINDT.

## **2.15 Facilities**

### **2.15.1 The Training Environment (infrastructure)**

- 2.15.1.1 The facilities within the Training Organisation (ATO) and associated RTCs shall meet the minimum requirements defined in this section, CM/GEN, ISO 18436-3 and PSL/65-CM.
- 2.15.1.2 The premises used for training shall comply with the latest issue of all relevant national statutory legislation, e.g. in the UK the Health and Safety at Work Act, COSHH Regulations and where applicable, Ionising Radiation Regulations.
- 2.15.1.3 Suitable safety notices shall be displayed in appropriate locations accessible to students. Relevant safety data sheets shall be on hand at the point of use of potentially hazardous equipment or processes.
- 2.15.1.4 Training rooms, which includes hired facilities and practical facilities (if applicable, such as hotel seminar rooms) shall be well lit and ventilated and there shall be adequate provision of teaching aids such as blackboards or flip charts and audio/video equipment appropriate to the course. The training facilities may also be required to accommodate certification qualification examinations that would require the appointment, by BINDT, of an independent invigilator in accordance with PCN documents PSL/62-CM, PSL/63-CM and PSL/65-CM.
- 2.15.1.5 All hired facilities shall be subject to an on-site audit conducted by the ATO prior to training and the audit should meet the conditions set in PSL/65-CM under **Examination conditions**. A copy of this audit should be kept on file with the candidates training records which shall be checked at the scheduled BINDT audits

### **2.15.2 Equipment**

- 2.15.2.1 Sufficient condition monitoring equipment, including instruments and accessories, shall be available to cover the full range of techniques within the condition monitoring method being taught, enough to satisfy adequate in-class practical demonstration and practical exercises for students, compliant with the training requirements of CM/GEN and associated requirements, and ISO 18436, and the equipment holdings specified in Appendix 2. Appropriate Personal Protective Equipment shall be available to students if required.

### **2.15.3 Specimens**

- 2.15.3.1 In-class training materials or specimens shall be available in sufficient quantity and complexity to cover the full range of applications encompassed by the course curriculum, as specified in this document at Appendix 2.

### **2.15.4 Technical Library**

- 2.15.4.1 The Training Organisation (ATO) shall maintain an up to date library of condition monitoring Standards and essential reading textbooks defined in Annex B of the CM/GEN appendices, relevant to the method being taught, including current versions of CM/GEN and associated appendices. Students shall be made aware of the existence of these Standards, educated in their use, and given open access to these documents. Trainers travelling to RTCs shall provide the necessary reference material for the classes undertaken at the RTC.

## **2.16 Training Staff - General**

- 2.16.1 The ATO's management structure shall include a Training Coordinator (however named) with overall responsibility for the technical operation of the training facilities and for ensuring that the BINDT requirements are met.
- 2.16.2 The training facility shall have sufficient trainers to ensure that as a minimum, one trainer is present throughout each course in line with the specific approved documentation requirements.
- 2.16.3 The ATO shall have a process for the evaluating the competence of all trainers as detailed in clause 2.6.3. Competency evaluations shall be by peer review. Records of trainer competency evaluations shall be retained by the ATO.
- 2.16.4 The ATO shall permit only those personnel named in the quality management system and on the BINDT ATO Scope of authorisation as trainers to supervise the conduct of training. Trainers shall hold relevant PCN certification (or certification recognised by BINDT), otherwise the ATO shall demonstrate to the satisfaction of BINDT that the trainer has received appropriate training in instructional techniques.
- 2.16.5 The ATO shall notify BINDT of any changes or additions to trainers (supervising the conduct of training) listed on their authorisation.

## **2.17 Training Staff – Certification**

- 2.17.1 A member of staff of, or consultant to, the training organisation shall be assigned with overall responsibility for each validated course of training for which the ATO is approved. The assigned individual is required to hold certification, recognised by BINDT, at a level equal to or higher than the highest category for which the ATO offers training.
- 2.17.2 Trainers should hold valid condition monitoring certification for the condition monitoring method that the course covers, and this certification should not be less than category 2. Where the course is providing training for category 3 candidates, the trainer should hold relevant category 3, certification. For VA only, where the course is providing training for category 4 candidates, the trainer should hold relevant category 4 certification.

## **2.18 Training Staff – Teaching Qualifications**

- 2.18.1 Training Organisations shall employ a minimum of one staff member formally trained in instructional techniques. A trainer with external training in instructional techniques shall then disseminate training in instructional techniques to all training staff who have no formal instructional training. Records of dissemination of instructional training shall be compiled and retained by the ATO. Alternatively, training staff may demonstrate that they have a minimum of one years teaching experience. Peer review by BINDT CMTC may be called upon if neither of the above requirements can be satisfied.

## **2.19 Training Staff – Experience**

- 2.19.1 Training Staff shall have knowledge of materials science, appropriate engineering applications (including equipment/machinery) and product technology, and have documented experience in the CM method(s) for which they are authorised to teach.

## **2.20 Training Staff – Maintenance of Method Awareness**

- 2.20.1 ATOs shall ensure that all training staff are kept up to date with the current versions of relevant International Standards, industrial procedures, practices and new innovations that may have an effect on training delivery within the CM methods for which they are approved. The ATO shall document how this is achieved.

## **2.21 Records**

- 2.21.1 There shall be a system for maintaining and reviewing the current state of all records held within the Training Organisation. Such records are to be kept in a secure location and treated with confidentiality.

### **2.21.2 Student Records**

- 2.21.2.1 Student records shall be raised and maintained for each enrolled student. They shall be retained for a period of not less than ten years and shall include the following, as a minimum:
- 2.21.2.2 Date(s) of enrolment and completion of training.
  - 2.21.2.3 Course on which enrolled including training location/venue.
  - 2.21.2.4 Trainers and assessors involved.
  - 2.21.2.5 Records of daily progress assessments; this should include any tests/assessment question papers attempted and records of practical training delivered during the course, including the trainer's comments.
  - 2.21.2.6 Records of any counselling or extra tuition delivered
  - 2.21.2.7 Final end of course assessment result(s) attained (where appropriate), including a copy of the completed assessment paper(s).
  - 2.21.2.8 A copy of the certificate of **successful** completion of the relevant training course, (Guidance on certificate content is given in Annex 1).

*Guidance note: A certificate of attendance is not regarded as a certificate of successful completion of training. Certificates issued by BINDT Approved ATOs may be used to prove eligibility for examination at any Approved Examination Centre and as such must state that the holder has successfully completed an approved training course. Certificates of successful training (training certificates) should only be awarded to those students who attain the required standard. The ATO may award certificates of attendance to any or all students, at its discretion, but these are not to be construed as certificates of successful completion of training and should carry a caveat stating such.*

### **2.21.3 Staff Records**

Records shall be raised, updated and maintained for all training staff. They shall be retained for a period of not less than ten years and shall include (as a minimum) records of:

- 2.21.3.1 Experience.
- 2.21.3.2 Qualifications.
- 2.21.3.3 Certification
- 2.21.3.4 Formal training and updating
- 2.21.3.5 Competency assessments

## **2.22 Equipment**

- 2.22.1 The Training Organisation shall maintain a fully documented system for the maintenance and calibration of CM Equipment. Internal verification of equipment against reference standards, or internal process checking using documented procedures/work instructions, is acceptable in determining the performance and suitability for training equipment. Internal verifications and process checks shall be conducted at planned intervals by ATO staff. Internal verifications and process checks shall be recorded and the records retained for audit purposes.

*Note: With regard to equipment used solely for training purposes, the ATO is expected to meet the requirements above. However, the calibrations conducted do not necessarily need to be traceable to National Standards except where personal safety is affected, i.e., in the case of equipment generating, emitting or monitoring ionizing radiations. Calibrations and/or verifications conducted as part of the training delivered may be acceptable providing they prove the reliability and suitability of the equipment in use and are recorded.*

## **2.23 Practical training materials & specimens**

- 2.23.1 The Training Organisation shall maintain a fully documented system for the unique identification of each practical training materials and/or specimen.

## **2.24 Remote Training Centres**

- 2.24.1 BINDT accepts that the majority of CM training is conducted away from the ATO's registered location. Consequently the ATO is not required to notify BINDT in advance of all remote training that is conducted on an ad-hoc basis at rented venues or client facilities.
- 2.24.2 If the remote training is conducted at a permanent facility owned by the ATO or a parent/subsidiary Organisation this location is deemed to be an official Remote Training Centre (not ad-hoc). If six or more training events are carried out at such an official remote training location in any twelve month period the training coordinator shall notify BINDT and the remote training centre shall be expected to apply to be an ATO in its own right under the criteria laid down in this document.

*Note: The need for an RTC to become an ATO after 6 training courses in a twelve month period shall not apply to remote training conducted at client premises or rented venues*

- 2.24.3 All remote training shall be conducted in accordance with the quality manual and operational procedures of the associated ATO.
- 2.24.4 Authorised trainers shall be listed on the ATO scope of approval and travel to the remote venue to deliver the training.
- 2.24.5 Upon completion of each training course, all training materials, where practical, shall be returned to the ATO. Where this is not practical and training materials, especially specimens, are stored at a remote venue then the ATO shall be responsible for security arrangements to ensure unauthorised access is prevented.

All remote venues are subject to premises/facility/equipment audit under the same restrictions and requirements applied to ATOs and must prove to BINDT that their CM training business operates solely in accordance with the ATO's quality and operational documents.

- 2.24.6 Where the Remote Training Centre is a fixed training facility operating under the control of the ATO then the ATO shall conduct an internal audit of the RTC at intervals not exceeding 12 months. The initial audit shall be conducted within 6 months of the date of initial RTC approval. Records of such audits shall be retained for BINDT review during assessments of the controlling ATO.
- 2.24.7 The control of Remote training in terms of training delivery, competence, security, impartiality and integrity remains with the controlling ATO. The ATO shall assess the suitability of any permanent or fixed infrastructure, equipment (inventory, control maintenance calibration) and overall facilities
- Note: The above requirements do not apply to one-off or infrequent training courses conducted at rented or hired venues. However, the ATO is responsible for ensuring such venues meet the requirements of this document in respect of the training delivered at those premises.*

2.24.8 BINDT reserves the right to visit and or assess RTC's at their discretion and without warning.

## **2.25 Control of Substances Hazardous to Health (COSHH)**

2.25.1 Disposal of chemicals used in the operation of training courses shall be carried out in accordance with applicable national regulations. A disposal register shall be maintained.

## **3. Audit & Approval Process**

- 3.1.** Upon receipt of a correctly completed application (forms APP/1-3 included in this document and also available under separate cover), BINDT shall appoint competent assessor(s) to carry out a documentation review which shall include:
  - 3.1.1.** A review of the application and supporting material supplied.
  - 3.1.2.** Assessment of modules for training course validation.
  - 3.1.3.** Assessment of the applicant's quality management system for compliance with this document.
- 3.2.** If the results of the review are satisfactory, the appointed assessor shall carry out a stage 1 on-site initial assessment of the applicant organisation to confirm that the infrastructure and resources comply with the requirements for BINDT approval. Where possible this will take place within 6 months of receipt of the application.
- 3.3.** After any agreed corrective actions relating to findings identified during the stage 1 audit have been implemented, and the organisation is finally confirmed to be complying with all applicable requirements, a report and recommendation for BINDT Approval shall be made by the appointed lead assessor to the Approval Panel.
- 3.4.** The authority to grant approval rests entirely with the BINDT Certification/Training Approval Panel (the Panel). Should the Panel consider that the applicant Training Organisation and associated course modules comply with the minimum requirements, approval by BINDT will follow. If not, the Panel shall not be obliged to give reasons for withholding approval though, wherever practicable, the maximum assistance shall be given to Training Organisations prior to any subsequent audit.
- 3.5.** After approximately six months of operating as an ATO, the organisation shall be subjected to a stage 2 initial assessment. This audit shall seek to confirm continuing compliance with the requirements by sampling records raised during the delivery of validated training. If successful in the initial stage 2 assessment, including the submission of any agreed corrective action evidence, the Training Organization will be issued a Certificate of Approval which includes a detailed schedule listing the locations and availability of BINDT validated training courses. This information will also be uploaded to [www.BINDT.org](http://www.BINDT.org)
- 3.6.** Wherever remote training centres are proposed, a Remote Training Centre (RTC) associated with an ATO shall apply for approval to RTC status on the relevant application form (APP/1) The RTC is managed by the controlling ATO.
- 3.7.** ATO are entitled to display the British Institute of Non-Destructive Testing Approval Logo (in accordance with PSL/31) and will receive a frame-able certificate to promote their business as a BINDT ATO. A copy of the BINDT logo can be obtained at request directly from BINDT's publishing department [info@bindt.org](mailto:info@bindt.org).
- 3.8.** Ongoing compliance with the requirements shall be confirmed during each three year approval cycle by annual surveillance and full reassessment.
- 3.9.** Surveillance shall be carried out on an annual basis by the appointed lead assessor who will examine the way in which training is conducted on site, including review of student records and files, and the site itself. At the discretion of BINDT, random and un-notified site visits may be carried out.
- 3.10.** Reassessment involves confirmation by a BINDT appointed audit team that the Requirements continue to be complied with. Reassessment is undertaken not less than three months prior to ATO certificate expiry.

**3.11.** As an alternative to 3.8 and 3.9 above and based upon the recommendation of the assessor and with the approval of the Certification/Approval Panel, for particular ATO BINDT may at its own discretion amend the approval cycle to biennial (two yearly) reassessment\* with no intervening annual surveillance. This waiver is purely at the discretion of BINDT and will only be considered for those organisations that have achieved a full three year cycle with relatively few or only minor findings. In such cases full reassessment audits will apply at the end of the two year certification period.

\*NOTE: ATO that have gained BINDT Quality Management System certification of compliance with ISO 9001 shall remain on the three yearly Approval cycle, maintained in phase with their ISO 9001 certification.

**3.12.** Guidance on the audit/assessment process is given in BINDT document CP10.

## **4. ATO Certificate Validity**

- 4.1.** Approval given under the scheme shall have a validity of three years (or two years where a full cycle of surveillance and reassessment has resulted in few or only minor nonconformities) subject to the maintenance of proper standards.
- 4.2.** The ATO Certificate, which remains valid subject to satisfactory annual surveillance and periodic reassessment, remains the property of BINDT and can be withdrawn at any time where justified. All ATOs will be added to the BINDT approval list, thus providing proof of validity and verification of an ATO certificate.
- 4.3.** Where changes occur in BINDT policy, the ATO will be informed and a period of adjustment, usually three months, will be allowed for the ATO to make any conformance transitions required.
- 4.4.** Where changes occur in ATO personnel, documentation, facilities or operating procedure, which may affect the validity of approval, BINDT shall be informed without delay. Failure to do so may result in a refusal to renew ATO status.
- 4.5.** Due to business fluctuations there may be periods during which training courses are not run, particularly at smaller ATOS. If no courses are held during a 12 month period then BINDT shall be advised of the situation. Every effort will be made to ensure that ATO status is maintained, but checks may be necessary prior to the next course being conducted to ensure that the training facility has in fact become fully operational.

## **5. Extensions**

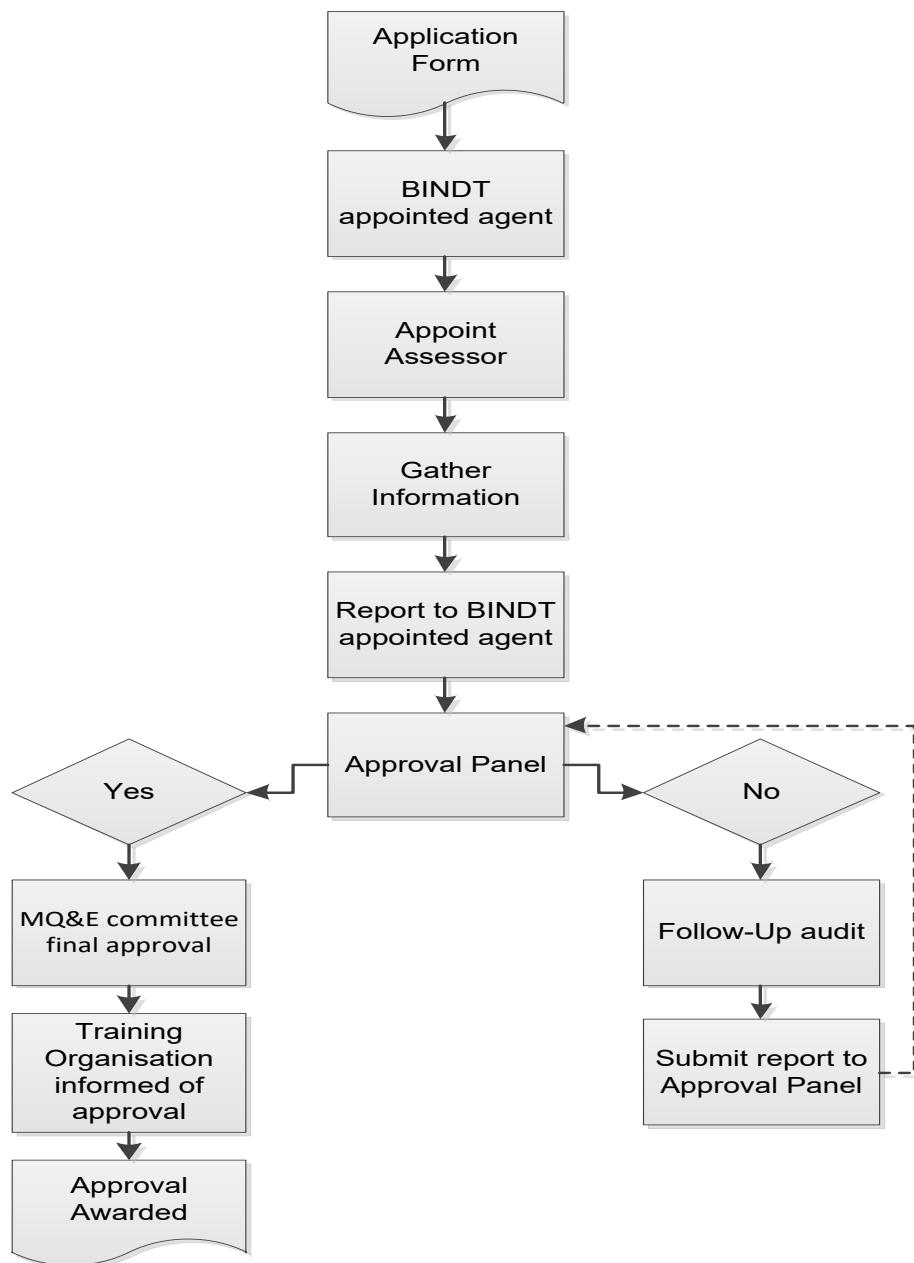
- 5.1.** Validation of additional course modules, subsequent to the initial visit, may require a further audit which may fall outside the sequence of an established audit cycle. The additional modules shall be submitted to BINDT electronically for review and validation. A copy of the curriculum and course notes, a list of equipment, specimens, trainer qualifications and a correctly completed application for extension form (See form APP/3) together with the current published fee, shall be provided to BINDT before the validation process is initiated.
- 5.2.** If an extension application is received for Level 2 approval and/or Level 3 recognition, then the ATO must already be approved for the lower level of this scope or they shall apply for the lower level also.

## **6. Audit Findings - Closure Process**

- 6.1.** Following completion of BINDT audits, the Lead assessor will present and agree the findings & observations raised with the Auditee (ATO). As part of the closure process timescales for presentation of root cause analysis and proposed corrective actions together with the final presentation of objective evidence for the actions taken will be agreed. Failure to complete the agreed process or actions within the agreed timescales may affect the Organisation's approval status potentially leading to Approval suspension or withdrawal (at the discretion of BINDT). The closure corrective action process is detailed in the process flow given in figure 2.

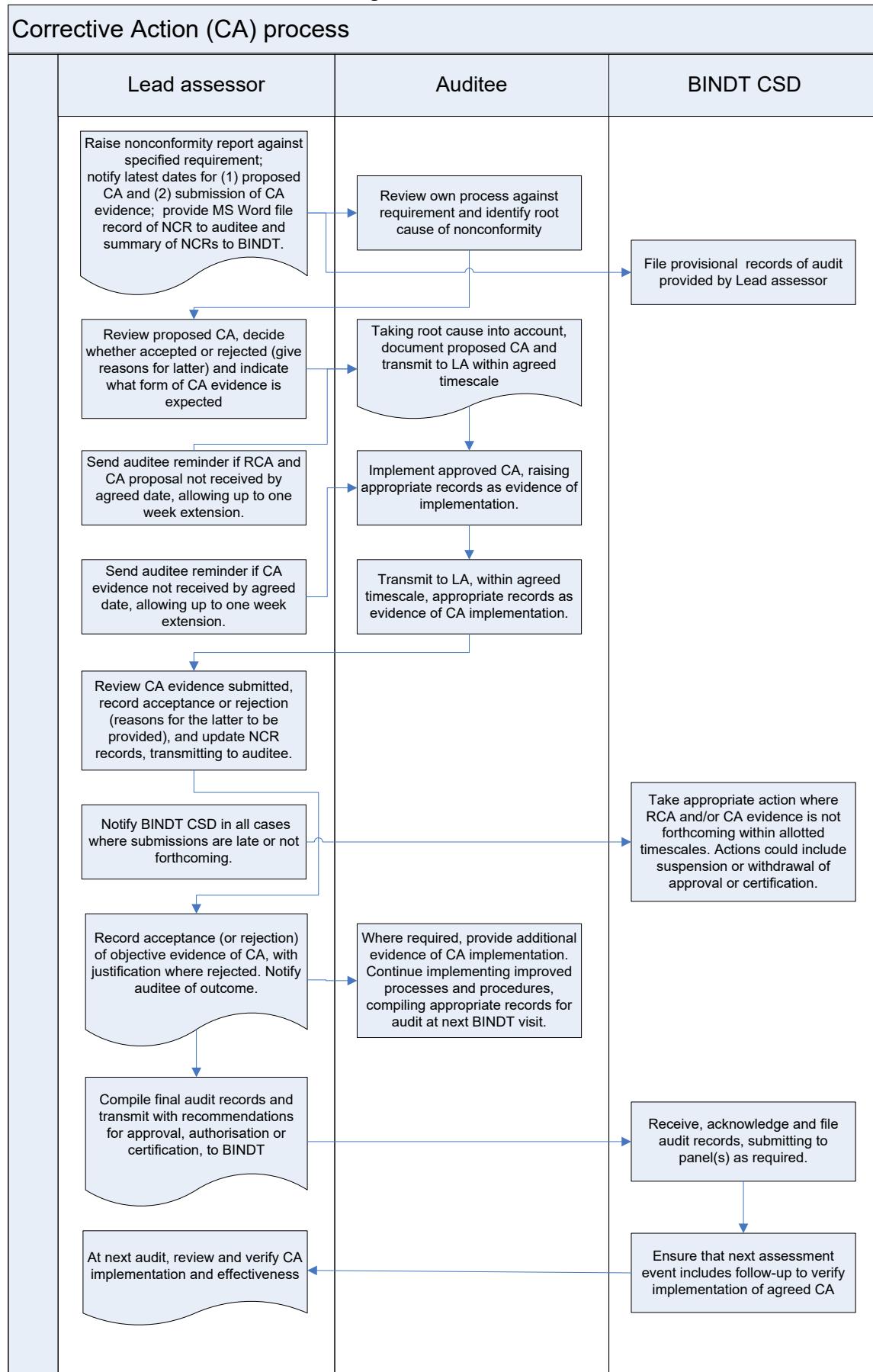
**Figure 1.**

**Approval of Training - System Diagram**



**Figure 2.**

**Audit Findings – Corrective Action Process**



## **ANNEX A - Training Certificates and Data Sheets**

This annex details the required minimum content for training certificates to be provided by the Training Organisation following successful completion of training

### **A1. Training certificates aimed to providing evidence of eligibility for ISO18436 examinations**

#### **Minimum content**

- Name and Address of the ATO & Training Location
- ATO status in respect of BINDT approval
- Student name
- CM method & level
- Statement of successful completion
- Certificate format document control reference
- Unique Certificate Number
- Course dates
- Duration in training hours
- Name of trainer
- Date of issue
- Name of ATO Authorised signatory
- Position of Authorised signatory
- Signature of ATO Authorised signatory

The certificate should also contain a statement that “successful completion of this BINDT Accredited course conducted at an Approved Training Organisation may be used as evidence of eligibility for PCN examination”

# The British Institute of Non-Destructive Testing



The following appendices, which were included in previous versions of CP08, are now available as separate documents under their own control arrangements:

- CP08CM Appendix 1: Application Form for new (proposed) Approved Training Organisations (ATO)
- CP08CM Appendix 2: Method Specific Checklist for new (proposed) Approved Training Organisations or Remote Training Centres
- CP08CM Appendix 3: ATO/RTC Application form for Training in additional Methods (Extension to scope)
- CP08CM Appendix 4: Withdrawn
- CP08CM Appendix 5: Course Feedback form

*The standardised Trainee feedback form included in previous versions of CP08CM has been withdrawn.*

*Approved Training Organisations are now permitted to create their own trainee/student feedback forms. The feedback form should allow the ATO to evaluate the quality of the training provided with consideration given to the varying aspects of the quality of the course in general, the performance of the tutor and the standard of the training venue, as a minimum. The ATO may add other considerations pertinent to their own requirements and circumstances, at their own discretion. A section for student summary comments is also required.*

*The use of numerical response grading is recommended in order to allow the ATO to evaluate the feedback and provide quantifiable data for use in gauging performance and to provide feedback to Management Review to assist in the review and establishing of Quality Objectives*

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## Appendix 6 – Equipment Requirements

### 1. Vibration Analysis

- a) Example machines –tabletop (e.g. rotor kit) or full size
- b) Vibration measuring instruments and transducers – capable of measuring overall vibration categories in terms of velocity, acceleration, and performing time and frequency analysis.
- c) Vibration Data Collector Instrument
- d) Computer – running vibration database software from which a data collector instrument can be loaded and to which data can be uploaded.
- e) Hand held tachometer or stroboscope (Cat II and higher).
- f) Ear Protection for when running machines (if required).
- g) Basic calculator
- h) Graph Sheets or Vector Diagram Sheets (Cat II and higher)

### 2. Infrared Thermography

- a) Artificial heating equipment (i.e. oven)
- b) A variety of material samples (i.e. metals, insulating and building materials) with various surfaces finishes.
- c) High emissivity materials (i.e. paint, PVC tape, powders etc.)
- d) Contact temperature probe and digital meter
- e) Black body simulator
- f) Library of thermograms (view foils)
- g) Non imaging non-contact infrared temperature measuring device (digital readout)
- h) The training organisation should have at least one thermo vision system capable of measuring temperatures and recording digitised thermograms. They should also have suitable software for subsequent processing of the images.

### 3. Acoustic Emission

- a) Sensors
- b) Cables
- c) Clamps
- d) Data acquisition system
- e) Computer

### 4. Lubrication Management

#### 4.1 Lubricant Management Lab

- a) Petri dishes, sample bottles, sample probes etc
- b) Small microscopes and hand-held magnifiers
- c) Non-Magnetic Tweezers & Probes.
- d) Cleaning Cabinet complete with Hand Sprays & Containers for processing MDP's and filters.
- e) Funnels, Filter Papers & Glassware for Filter Element Cleaning.
- f) Protective Clothing [apron, gloves, masks, goggles] for use with solvents.
- g) Contamination Analysis equipment

#### **4.1.1 Basic Laboratory techniques**

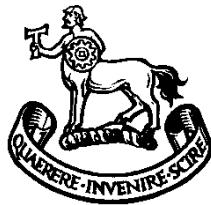
- a) Viscometry
- b) Titration
- c) Spectroscopy apparatus
- d) Particle counter

An Oil Analysis laboratory should provide a well ventilated, well-lit environment equipped with a fume cabinet, compressed air and water supply, eye wash station; with an enclosed-type room heating system [not open flame or element due to solvent environment].

#### **4.2 Lubricant Management Field**

- a) Selection of Oil sample bottle
- b) sampling adaptors
- c) Quills or syringes with plastic extension tubes
- d) Test ports
- e) Vacuum pumps and bottles
- f) Breathers
- g) Sediments bowls and oil containers

# The British Institute of Non-Destructive Testing



## Appendix 7 – Practical Training Material Requirements

### Acoustic Emission training specimens

- a) Case histories of various faults on pumps, fans, compressors, rolling mills, paper machines or other process equipment, machine tools, structures, piping, gearboxes.
- b) Damaged bearings or images of them
- c) Sample plates

### Thermography training specimens

- a) Different long wave and short wave IR window material
- b) A variety of materials of different emissivities to support training topics
- c) Portable heating device
- d) Variety of materials not opaque
- e) Variety of materials to demonstrate reflectivity and different surface texture

### Vibration Analysis training specimens

- a) Case histories of various faults on a selection of pumps, fans, compressors, rolling mills, paper machines or other process equipment, machine tools, structures, piping, gearboxes.
- b) Damaged bearings or images of them (Cat II and higher).
- c) Examples of different types of transducers
- d) Motor model(s) or machine(s) on which the following faults can be demonstrated:
  - o Unbalanced rotating components.  
And for Cat II and higher, a selection of the following
  - o Resonance,
  - o Electro-magnetic effects in stator.
  - o Aerodynamic forces (where applicable to machine)
  - o Hydraulic forces (where applicable to machine)
  - o Reciprocating forces.
  - o Bad belt drives.
  - o External forces.
  - o Misalignment of couplings

### Lubrication Management training specimens

- a) Drill swarf debris
- b) Oil samples [EP oil, oxidized oil, wet oil, high viscosity oil, low viscosity oil]

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## Appendix 8 – Sample practical skills evaluation exercises

### A. Lubrication management skill evaluation

#### Exercise 1

Candidates should be shown a diagram of an industrial oil system either an engine or hydraulic circuit with various sample locations indicated with numbers.

Candidates should be asked to identify the optimum position for taking a sample of the system oil to provide the most representative sample of the systems oil charge. Candidates should be asked how they would use a “thief” pump and the precautions necessary to obtain a good sample.

#### Aim of Exercise 1

Identifying the best place to obtain a sample of the system oil is of the utmost importance to correctly diagnose the condition of the oil and more importantly the condition of the unit. Candidates should be aware of the affect that the components of the system have on the contents of the sample, taking the sample before any filters or strainers, centrifuges etc... to obtain a truly representative sample. Thief pumps may be used to obtain samples from running equipment but there are a few simple rules to follow, a new length of tube should be used for every sample, the tube length should be long enough to reach the middle of the reservoir but not touch the bottom.

#### Exercise 2

Candidates should be shown titration machine used for testing acid or base number.

Candidates should be asked to identify the main parts of the machine, what it is used for and the working principles. Candidates should be shown the resultant graphical results and asked to identify the inflection point and estimate the acid or base number.

#### Aim of Exercise 2

To establish if the candidates has a working knowledge of Laboratory equipment used in routine oil analysis, can correctly identify the machine and how it works and correctly identify the inflection point and resultant acid or base number.

#### Exercise 3

Candidates should be given a simple used oil analysis report showing current and 2 previous sample histories and asked to diagnose the fault(s), including physical properties, wear metals and contaminants.

#### Aim of Exercise 3

The aim of this skills test is to ascertain the candidate's knowledge of used oil analysis and whether they are able to correctly diagnose the faults present.

## Summary of changes

ISSUE	ISSUE DATE	SUMMARY / BRIEF DESCRIPTION OF CHANGES
1	1 <sup>st</sup> April 2017	Word 'normally' removed 2.10.2 Successful completion of a training course shall <u>normally</u> be determined by students....
1.1	19 <sup>th</sup> July 2017	Clause removed – not applicable to CM courses. 2.10.3 As an alternative to an end of course assessment/test the ATO may administer a series of progress (continual) assessments that are appropriately documented, controlled and administered under exam conditions. If a series of progress (continual) assessments are used the results shall be compiled at the end of course and an overall mark attributed [pass mark of 75%] (pass mark of 70% for LA & VA only)
2	9 <sup>th</sup> August 2018	Full review and update to remove ambiguity and cross-referencing to specific NDT requirements (not CM specific)
3	1 <sup>st</sup> July 2019	<ul style="list-style-type: none"> <li>• Forms at Appendices 1 -3 removed to separate controlled forms</li> <li>• Appendices 4 &amp; 5 withdrawn – reference remains</li> <li>• The following clauses have also been revised:           <ul style="list-style-type: none"> <li>2.3 Conformity to ISO18436</li> <li>2.4 Quality Management System</li> <li>2.10 Student Assessment</li> <li>2.11 Formal Examinations</li> <li>2.14 Course Notes/Materials</li> <li>2.17 Training Staff – Certification</li> <li>2.18 Training Staff – Teaching qualifications</li> <li>2.19 Training Staff – Experience</li> <li>2.21 Records</li> <li>2.24 Remote Training Centres</li> </ul> </li> </ul>
4	1 <sup>st</sup> February 2021	<ul style="list-style-type: none"> <li>• Amended Appendix 6 Lubrication Analysis equipment requirements.</li> </ul>