SMRPCO
Certifying Organization

CANDIDATE HANDBOOK



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INTRODUCTION

Headquartered in Atlanta, Georgia, the Society for Maintenance & Reliability Professionals Certifying Organization (SMRPCO) is the certifying body of the Society for Maintenance & Reliability Professionals (SMRP) – a global professional society serving over 7,500 members.

MISSION

To develop and promote excellence in maintenance, reliability and physical asset management.

VALUES

SMRP values data-driven excellence, sharing/collaboration, membership focus, continuous improvement, accountability, trust and respect, integrity and social responsibility.

MEMBERS

7,500+ members worldwide with a more than 80% increase in overall membership in the past five years and 145% increase in international membership in the past five years.

About the SMRP Certifying Organization

SMRP was formed in 1992 by practitioners from 18 different companies who were passionate about actively promoting maintenance and reliability within their field and to the public. In 1997, SMRP formed SMRPCO to create a certification program to validate the skills and knowledge of maintenance, reliability and physical asset management practitioners. Three years later, the first Certified Maintenance & Reliability Professional exam (CMRP) was administered.

Today, SMRPCO offers three exams:

- Certified Maintenance & Reliability Professional (CMRP)
- Certified Maintenance & Reliability Technician (CMRT)
- Certified Asset Management Assessor (CAMA)*

* The CAMA exam is managed by the World Partners in Asset Management. For information on the CAMA exam, visit www.wpiam.com.

Purpose of SMRPCO

SMRPCO serves to foster high standards and ethical and professional practice in the delivery of services through a recognized, credible credentialing program that assures competency of practitioners in the maintenance, reliability and physical asset management profession. SMRPCO is committed to the underlying ethics upon which the certification process rests – absolute fairness and equity in the administration of examinations and recertification for all applicants without discrimination.

Statement of Impartiality and Nondiscrimination

SMRPCO's leadership and management, including its Certification Commission, endorse the principles of impartiality and equal opportunity, and commit to act impartially and equitably in relation to its applicants, candidates, and certificants, including but not limited to: 1) applying its standards and requirements for examinations and certifications equally to all individuals regardless of age, race, religion, gender, sexual orientation, gender identity, national origin, veteran status or disability, 2) implementing its policies and procedures impartially and fairly, 3) not restricting certification based on undue financial or other limiting conditions, and 4) not allowing commercial, financial, or other pressures to compromise impartiality in certification activities.

Purpose of this Guide

This guide was developed to help candidates apply and take the CMRP or CMRT exam. It also provides in-depth information on the application process, exam administration, and the rules and procedures for maintaining a SMRPCO certification after an individual achieves it.

For additional information not covered in this guide, please contact SMRPCO staff at certify@smrp.org.

Important Information

The most current version of this document is available at www.smrp.org.

As a candidate or certificant, you are responsible for keeping SMRPCO informed of your current contact information. If your mailing or email address changes, be sure to update your SMRP profile on the website. Failure to update SMRPCO of your contact information may result in missing important notifications about your certification.

SMRPCO
Certifying Organization

CERTIFIED MAINTENANCE & RELIABILITY PROFESSIONAL (CMRP) EXAM

About the CMRP Exam

The CMRP program is the leading credential for certifying the knowledge, skills and abilities of maintenance, reliability and physical asset management professionals. The CMRP exam is a thorough test of a broad scope of expertise measured against the universal standard. It was developed to assess professionals' aptitude within the five pillars of the SMRP Body of Knowledge, which include: business and management, manufacturing process reliability, equipment reliability, organization and leadership, and work management.

Accreditation and Recognition

The CMRP is accredited by the ANSI National Accreditation Board (ANAB), an independent third-party organization that evaluates certification programs and organization requirements on a regular basis. The CMRP exam is the only certification program of its kind accredited by ANAB under the ISO/IEC 17024 standard. Visit www.anab.ansi.org to learn more about accreditation.

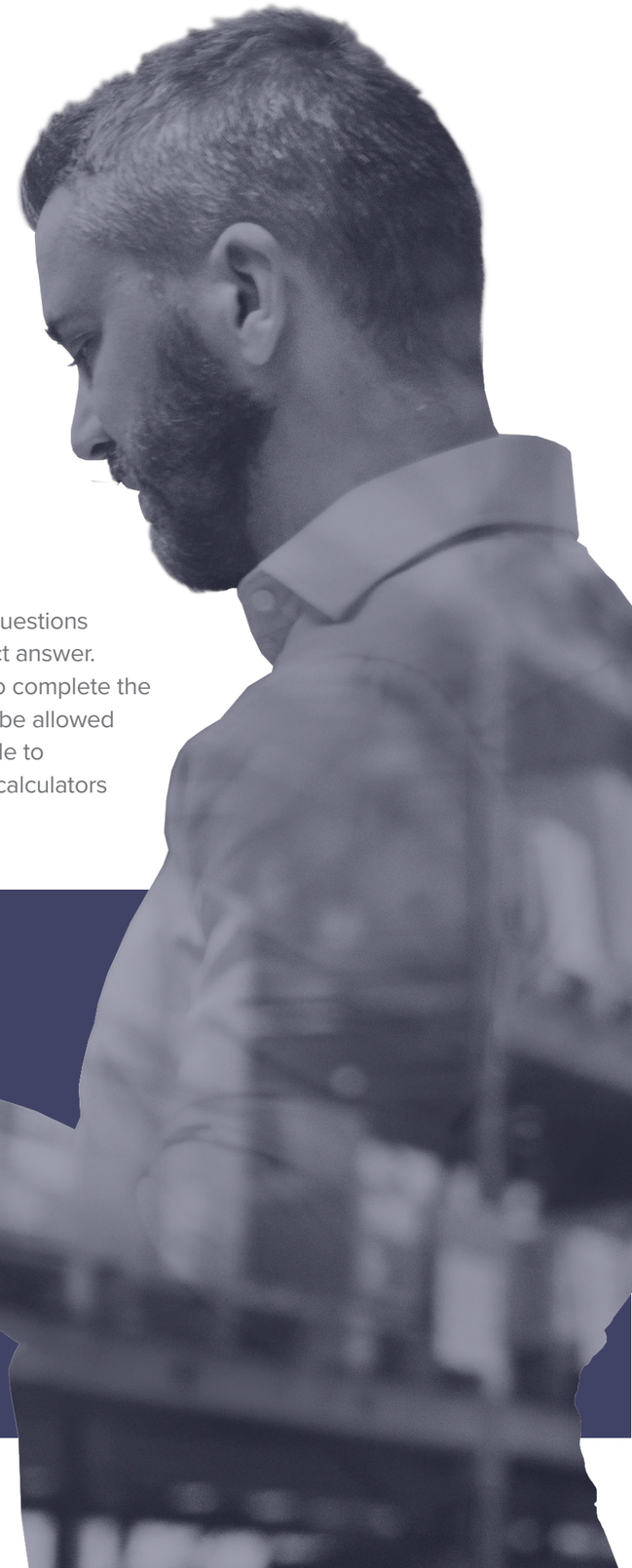
ANAB
ANSI National Accreditation Board
ACCREDITED
ISO/IEC 17024
PERSONNEL CERTIFICATION BODY

Education/Experience Requirement

The CMRP is an experienced-based exam. A candidate is unlikely to pass the exam based on knowledge gained from a book, course or educational degree. Though SMRPCO does not endorse a specific study pathway to achieving a passing score on the CMRP, there are numerous study resources available at www.smrp.org.

CMRP Exam Questions

The CMRP exam contains 110 multiple-choice questions with four possible answers and only one correct answer. Examinees have two and one-half (2.5) hours to complete the closed-book exam. No reference materials will be allowed during the exam. Online calculators are available to examinees to assist with calculations. External calculators are not allowed.



EXAM FEES

SMRP members	**$300** (USD)
Nonmembers	**$470** (USD)
Sustaining Sponsor Employees	**$250** (USD)
U.S. military veterans	**$250** (USD)

CERTIFIED MAINTENANCE & RELIABILITY TECHNICIAN (CMRT) EXAM

About the CMRT Exam

The CMRT program is the leading credentialing program for the knowledge, skills and abilities of maintenance and reliability technicians. The certification assesses the proficiency of those responsible for preventative, predictive and corrective maintenance – multi-skilled individuals who play a critical role in the success of organizations worldwide. Earning the CMRT credential indicates that you have achieved a level of ability consistent with the requirements for competence on the job as a multi-skilled maintenance and reliability technician.

The CMRT exam tests competency and knowledge of specific tasks within four (4) domains:

- **Maintenance Practices**
- **Preventative and Predictive Maintenance**
- **Troubleshooting and Analysis**
- **Corrective Maintenance**

EXAM FEES

SMRP members	**$250** (USD)
Nonmembers	**$300** (USD)
Sustaining Sponsor Employees	**$195** (USD)
U.S. military veterans	**$195** (USD)

Education/Experience Requirement

The CMRT is an experienced-based exam. A candidate is unlikely to pass the exam based on knowledge gained from a book, course or educational degree. Though SMRPCO does not endorse a specific study pathway to achieving a passing score on the CMRT, there are numerous study resources available at www.smrp.org.

CMRT Exam Questions

The CMRT exam contains 100 active questions and 10 pre-test questions. Examinees have two and one-half (2.5) hours to complete the closed-book exam. No reference materials will be allowed in the exam room during the exam. Online calculators are available to examinees to assist with calculations. External calculators are not allowed.



CERTIFICATION SUMMARY

Select a Certification

SMRPCO offers certifications for different points in your career. Assess your education, work experience and knowledge to select the SMRPCO certification that is right for you.

Determine Eligibility

The first step in the certification process is to review all of the eligibility requirements for your selected exam, and ensure you are qualified to sit for the exam before completing an application.

Complete Your Application and Pay

After you determine that you are eligible to take your selected exam, complete the applicable exam application. Your application will not be accepted until payment is made. Upon completing your application and paying, you will have six months to sit for the exam.



Schedule Your Exam

The CMRP and CMRT exams are delivered by Pearson VUE, the official computer-based testing provider for SMRPCO. Once SMRPCO processes your application and payment, you will receive an “Authorization to Test” email from Pearson VUE with instructions for how to create a profile with Pearson VUE and schedule your exam. More information about scheduling your exam can be found here.

Take Your Exam

Candidates have six months from the date of payment to take a SMRPCO exam. You must schedule and sit for your exam within those six months. Those who fail to take the exam within the six-month window must reapply and pay for the exam as new candidates.

Exams may be taken at a Pearson VUE computer-based testing facility. Pearson VUE has over 5,000 testing centers worldwide, including on U.S. military bases. Candidates can locate a testing center online here. SMRPCO exams are delivered via computer at Pearson VUE facilities, and candidates are not required to bring their own.

Get Your Results

Exam results are available immediately after submitting the exam. Candidates that do not pass the exam are eligible to retake the exam after six months. To retake the exam, a candidate must reapply and pay as a new candidate.

Maintain Your Certification

After successfully passing a SMRPCO exam, candidates are responsible for maintaining their certification. Both the CMRP and CMRT exam are active for three years. At the end of the three-year cycle, certificants are required to submit a recertification application detailing their continuing education and to pay a recertification renewal fee to maintain a SMRPCO certification. More information on the recertification process is available here.

CERTIFICATION REQUIREMENTS

EXAM ELIGIBILITY

There are no educational experiences or requirements to sit for the CMRP or CMRT exam. In order to take the CMRP or CMRT exam, a candidate must:

1. **Complete the CMRP or CMRT application, which is available at www.smrp.org**
2. **Pay all applicable fees**
3. **Not have taken the applicable exam within six months**

Candidates who are unable to comply with the eligibility requirements will not be allowed to take a SMRPCO exam. Candidates are permitted to take all SMRPCO exams, so long as all eligibility requirements are met, for as many times as necessary to achieve a passing score.

Application Process

Eligible individuals who wish to pursue the CMRP or CMRT credential must complete the online application and pay the applicable fees to take the exam.

SMRPCO applications are open, meaning there is no schedule or deadline to apply and pay for an exam.

Obtaining an Application

The CMRP and CMRT applications are available on the SMRP website and must be completed and submitted online. Paper applications are not available.

CMRP Application

CMRT Application

Exam Fees and Payment Methods

Candidates are required to pay the applicable exam fees to complete the exam application. Payment can be made online via major credit cards, by check and through wire transfer. SMRPCO also accepts group payments. For information on how to pay for a group, contact staff at certify@smrp.org.

SMRPCO reserves the right to adjust exam fees. When applicable, fees will be updated on the SMRP website and in the most current version of this guide.

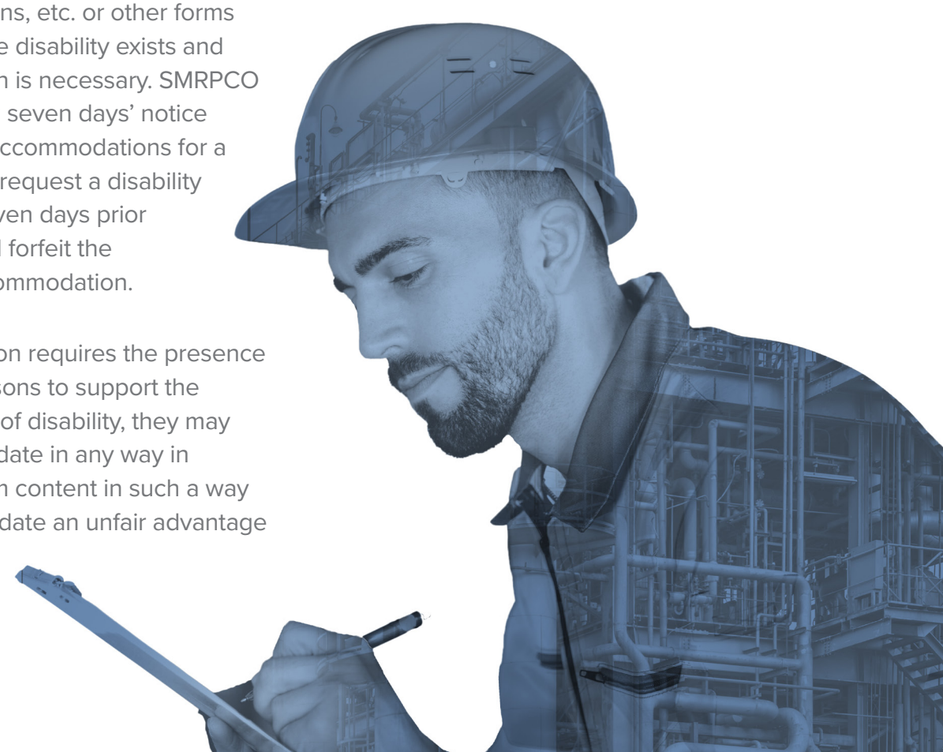
Requests for Special Testing Accommodations

SMRPCO offers accommodations for candidates with disabilities and candidates for whom English is a second language.

If a candidate has a disability that requires accommodation to sit for the exam, the candidate must indicate they have a disability within the applicable certification application and submit a request for accommodation by emailing certify@smrp.org. Individuals requesting accommodation must provide proof (signed statements from supervisors, caregivers, physicians, etc. or other forms of evidence) that the disability exists and that accommodation is necessary. SMRPCO requires a minimum seven days' notice to request special accommodations for a disability. Failure to request a disability accommodation seven days prior to an exam date will forfeit the opportunity for accommodation.

If the accommodation requires the presence of one or more persons to support the candidate because of disability, they may not assist the candidate in any way in understanding exam content in such a way as to give the candidate an unfair advantage over candidates without disabilities. Supporting personnel must agree to SMRPCO's Nondisclosure Agreement and agree to not sit for the exam for five years after the date they assist a candidate.

Candidates, whose primary language is not English, may use a strict translation dictionary developed for common use during a certification exam. Candidates must bring their own dictionary to the testing center or exam venue. Any dictionary that has definitions, any written notes, or additional text will not be allowed. Dictionaries will be inspected by the exam proctor, and those who violate this policy will have the dictionary seized. Candidates who refuse to allow the proctor to inspect the dictionary or bring a dictionary that does not meet SMRPCO guidelines will not be allowed to test with the dictionary.



Denied Applications

When any application for eligibility for a SMRPCO certification is denied, the applicant will be notified in writing (including email), and the application fee, less than a 10% processing fee, will be returned.

An application may be denied when:

- **Any part of the application is incomplete**
- **Any part of the application is illegible**
- **The application is not accompanied with the correct fees**
- **An application and its supporting documentation do not adequately substantiate or properly demonstrate that the applicant has met the minimum eligibility criteria.**

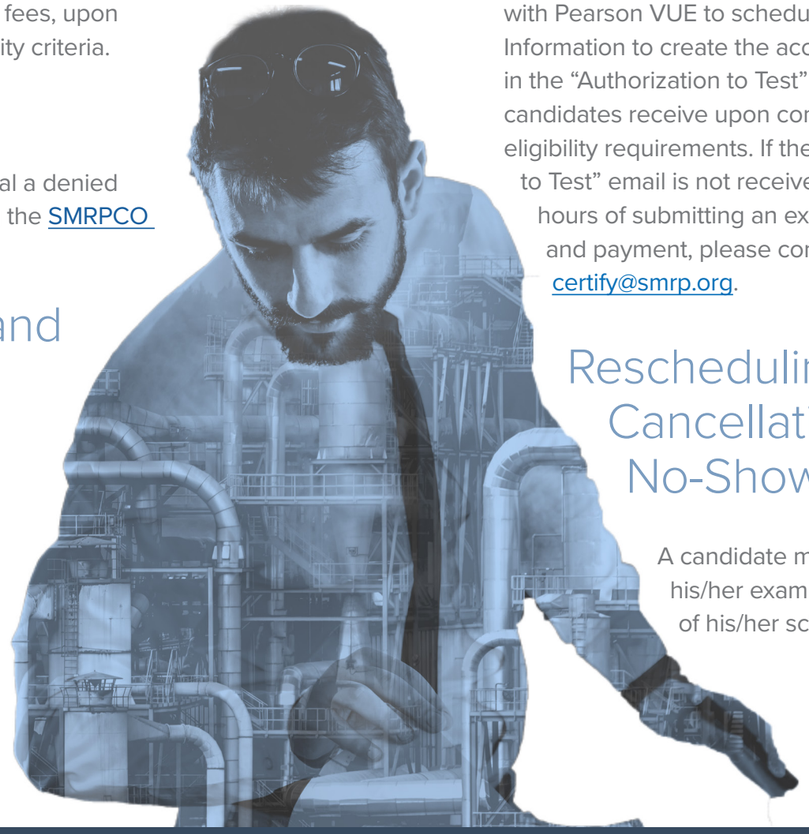
Denied applications may be appealed or resubmitted, with full fees, upon completion of all eligibility criteria.

Appeals

An individual may appeal a denied application by following the SMRPCO appeals policy.

Test Dates and Scheduling

Once approved to take the CMRP or CMRT exam, candidates may schedule an exam with Pearson VUE at a time and location that is convenient, pending availability.



Candidates will need to create an account with Pearson VUE to schedule an exam. Information to create the account is available in the "Authorization to Test" email that candidates receive upon completing all eligibility requirements. If the "Authorization to Test" email is not received within 24 hours of submitting an exam application and payment, please contact staff at certify@smrp.org.

Rescheduling, Cancellation and No-Show

A candidate may not cancel his/her exam within 48 hours of his/her scheduled exam session, unless there is a personal or medical emergency that is deemed an approved excuse. If a candidate does not appear for the exam ("no-shows"), SMRP reserves the right to charge the candidate a fee.

If a candidate cancels or changes his/her exam sessions more than 48 hours in advance, the candidate may reschedule the exam session.

Refunds

SMRPCO shall not issue refunds or partial refunds of certification or recertification application fees unless an applicant is denied eligibility. In the event that an applicant is denied eligibility to sit for the examination, a 10% processing fee will be charged and the applicant will be refunded the remainder of the application fee. Refunds will be provided only upon written (including e-mail) request.

SCHEDULING AN EXAM AT A TESTING CENTER

To locate a Pearson VUE testing center, click here. All Pearson VUE testing facilities are subject to change. Once you have identified a testing center, follow the directions below to schedule your exam.

1. **Visit the SMRP landing page on Pearson VUE's website**
2. **Sign in to your Pearson VUE account**
3. **Click on "Pre-approved Exams"**
4. **Select your exam**
5. **Select the exam date, location and time**

PREPARING FOR THE EXAM

Exam Preparatory Training and Resources

SMRP may offer preparatory courses, but SMRPCO will not offer or endorse such courses, in an effort to remain impartial in the certification process.

SMRP does not currently offer CMRP or CMRT preparatory courses; however, SMRP's education program offers several ways to learn about topics relevant to the CMRP and CMRT exams.

Professional Development Webinar Program

SMRP offers live webinars every year through its Professional Development Webinar Program and has over 140 on-demand webinars available via the SMRP Library. All webinars are carefully evaluated through a rigorous and unbiased peer review process to ensure they align with SMRP's mission. You can be sure the material will be relevant and practical, and it will be taught by a knowledgeable, experienced instructor. All SMRP webinars are free to members. Nonmembers can purchase a webinar for a fee.

SMRP Library

The SMRP Library contains downloadable documents, such as the SMRP Body of Knowledge, best practices, presentations from past conferences and metrics to help members further develop their professional skills. All materials are available for free to members and at varied costs to nonmembers.

CMRP Roadmap

SMRPCO volunteers developed The CMRP Roadmap to help candidates prepare for the CMRP exam. The document identifies eight areas that help individuals master the five pillars of the SMRP Body of Knowledge and adequately prepare for the CMRP exam.



Exam Integrity

SMRPCO takes the integrity of its exams seriously and requires its volunteers, examinees and certificants to follow strict nondisclosure agreements. When those who hold SMRPCO credentials or those who are pursuing SMRPCO credentials share exam information, they are violating the agreement they made to SMRPCO during the application process. Similarly, a volunteer or certificant who shares confidential exam information by any means also violates SMRPCO policies.

SMRPCO pursues disciplinary action, including legal action, against individuals or organizations who compromise the integrity of its exams. SMRPCO also takes action against individuals who falsely claim to hold a SMRPCO certification. Penalties include permanently barring individuals from pursuing a SMRPCO exam, revoking certification designations, and other legal remedies.

If you become aware of an individual or company who are sharing exam related content, please contact certify@smrp.org.

EXAM OVERVIEW

Computer-based Testing

SMRPCO exams are delivered online via computer-based testing at Pearson VUE testing centers. No matter the location, the exam will be presented the same way. One question at a time will be displayed on the computer screen. Examinees may select an answer using their mouse or keyboard. The examinee will have access to a calculator on the screen, a timer indicating the amount of time left for the exam and a flag icon to mark a question for review throughout the entire exam session.

Examinees can mark questions to return to later or simply skip questions. At the end of the exam, examinees will have a chance to review all questions prior to submitting their answers to be scored. After answering or skipping the last question, there will be a table on the screen that includes all of the questions and indicates any questions flagged for review. An examinee may click on the question(s) and return to the question and corresponding answers to review the previously-selected answer and change it if necessary. After you review your answers, you will submit your exam by click “End Exam.” You will receive a pass/fail result immediately. Full score reports will be available upon exiting the exam browser.

Keep in mind that all SMRPCO exams are closed book. Examinees may not access notes or other reference materials during the exam session, unless previously-authorized by SMRPCO due to disability or language needs.



EXAM DAY INFORMATION



Inclement Weather or Emergency

In the event of inclement weather or an emergency, an individual's safety is of the utmost importance. When weather causes a test center to be closed or an examinee cannot safely travel to an exam session, the examinee may reschedule their session with no penalty. Examinees should contact Pearson VUE customer service directly to reschedule.

Admission to the Test Center or Exam Session

Examinees must present one valid form of identification to gain admittance into the exam session. If an examinee is testing outside of his or her country of residence, the examinee should provide a valid passport as identification. When testing at a Pearson VUE testing facility, the examinee will need to review and sign a candidate rules agreement before being admitted to take the exam. Refer to the "Rules for the Exam" section for additional information on rules.

Rules for the Exam

SMRPCO examinees are required to comply with the below rules when sitting for the CMRP or CMRT exam. Failure to comply with rules will result in termination of the exam or invalidation of exam scores.

AFTER THE EXAMINATION

Exam Results

At the conclusion of the exam, preliminary results shall show onscreen. Candidates may access full results immediately upon exiting the exam by logging into his or her Pearson VUE online profile. The examination score reports shall reflect pass or fail status. Candidates shall be given access to diagnostic, non-numerical information indicating their overall performance for each domain of the exam.

Confidentiality

All examinees are expected to keep all exam information confidential, even after the exam. Refer to section "Exam Integrity" for more information.

Cancelled Scores

Exam scores may be cancelled if SMRPCO is made aware of a violation of exam integrity or a violation of candidate rules during or after an exam session.

Appeals and Complaints

Certification Program Complaints

Individuals with concerns regarding the certification program materials, personnel or activities are encouraged to discuss these with the individuals involved to try to resolve the matter informally. SMRPCO staff may be contacted to discuss concerns related to the application or examination process, including testing center experience, by emailing certify@smrp.org. In some cases, informal resolution is not possible, and individuals may wish to file a formal complaint.

A formal complaint will be submitted electronically on the SMRP website within 90 days of the incident's occurrence. In the case of complaints related to exam administration, those must be submitted within two weeks after the applicable exam administration. The submission will include sufficient objective evidence to substantiate the claim(s) and appropriate action to be taken. Dissatisfaction based on hearsay will not be considered as a complaint. Anonymous complaints will not be considered.

The SMRPCO Executive Director or assignee will serve as the first level of complaint consideration to determine its validity. He or she will investigate the circumstances of any valid complaint and take one of the following actions:

- **Determine and implement corrective action**
- **Refer the complaint to a different suitable staff member to determine and implement corrective action**
- **Escalate the complaint to the Certification Commission for review**

If the complaint is not immediately resolvable, written notice of progress (of a referral or escalation) will be provided to the complainant within 10 business days of complaint receipt.

In all cases, the SMRPCO Executive Director or assignee will communicate the proposed resolution to the complainant within a period of no longer than 30 days.

If for any reason the target deadlines in this policy are not able to be met, a progress notice will be sent to the complainant, outlining when the findings will be communicated.

If a complaint is found to warrant escalation, the SMRPCO Chair will be notified, and the complaint will be reviewed by the Certification Commission or its designees. A decision will be communicated to the complainant within a period of no longer than 30 days.

If for any reason the target deadlines in this policy are not able to be met, a progress notice will be sent to the complainant, outlining when the findings will be communicated.

The determination of staff or the Certification Commission is appealable, and the appeals policy will apply.

Appeals

An examinee may file an appeal regarding his/her exam scores by following the SMRPCO appeals policy.

RE-EXAMINATION

An individual may take a SMRPCO exam as many times as it takes to achieve a passing score. To apply for re-examination, an individual must meet the following requirements:

- **Complete the CMRP or CMRT application, which is available at www.smrp.org**
- **Pay all applicable fees**
- **Not have sat for the applicable exam within six months**

AFTER ACHIEVING A SMRPCO CERTIFICATION

Certificates

A non-transferable certificate shall be issued only to individuals found to meet all SMRPCO certification requirements. No other factors shall be used to determine an individual's qualification to earn the certification.

Examinees that successfully pass a SMRPCO examination receive a digital certificate and one complimentary hard-copy certificate. Additional hard-copies of a certificate may be purchased for a fee. Information on how to obtain a certificate is available on the SMRP website.

Digital Badges

Upon successfully passing a SMRPCO examination, individuals receive a digital badge to utilize online. The digital badges verify a certificant's achievements and include both the date of issuance and date of expiration. Information on how to obtain a digital badge is available here.

Online Directories

Individuals holding an active SMRPCO certification are displayed in the CMRP or CMRT online directory on the SMRP website. Individuals may opt out of publication during the time of application or by emailing SMRPCO staff at certify@smrp.org.

Certification Status and Use of Certification Marks

Individuals who successfully pass the CMRP or CMRT exam are granted use of SMRPCO credentials and logos, pursuant with SMRPCO policies.

Maintaining a SMRPCO Certification

Certificants must meet recertification requirements during the three year certification cycle to retain certified status for each subsequent three year cycle. The recertification program helps certificants to stay abreast of changes and best practices in the maintenance, reliability and physical asset management profession.



RECERTIFICATION

Certificants begin receiving recertification reminders one year from the date their certification expires.

To recertify, certificants must:

1. **Complete the applicable recertification application located at www.smrp.org within 90 days of their CMRP or CMRT certification expiration date**
2. **Pay all applicable fees; individuals age 65 and older may waive the fee**

A candidate who does not recertify within 90 days of his or her CMRP or CMRT certification expiration date is considered expired and must retake the applicable exam. If the candidate fails the exam for renewal purposes, he or she will not have his/her certification.

Recertification Application

Certificants must acquire 50 course hours from a combination of two or more activities as described below. Keep in mind, some categories do have a limit to the number of course hours a certificant may claim.

Continuing professional education in areas relevant to the five pillars (CMRP) or the four domains (CMRT) described in the applicable Body of Knowledge

Actual hours spent in the classroom

Complete educational workshops, seminars, on-demand education or other online courses relevant to subject areas in the applicable Body of Knowledge

Actual hours spent in the workshop or seminar or viewing an online presentation

Participate as an active member of the SMRP Board of Directors, an active member of an SMRP committee, an active member of the SMRPCO Certification Commission or an active member of a SMRPCO committee.

Actual hours spent in such meeting activities or proctoring a CMRP or CMRT exam

Attend annual/executive/chapter meetings at organizations relevant to subject areas of the applicable Body of Knowledge (e.g., SMRP, ASQC, ASNT, CSNDT, NGLI, CMVA, STLE, IIE, IMC, etc.)

Actual hours spent in such activities

Attend conferences relevant to the subject areas in the applicable Body of Knowledge (e.g., SMRP, ASQC, ASNT, CSNDT, NGLI, CMVA, STLE, IIE, IMC, RCM, PdM Vendor Sponsored Conferences etc.)

Actual hours spent in conference sessions up to six hours for each day of attendance

Give presentations at conferences or seminars relevant to subject areas within the applicable Body of Knowledge

Up to 40 hours granted to develop and deliver a paper

Publish articles or papers in publications to subject areas in the applicable Body of Knowledge

Up to 40 hours granted for writing an article

Author a book or a significant chapter of a book relevant to subject areas in the applicable Body of Knowledge

Actual hours spent writing the book

Provide instruction for a course or workshop relevant to subject areas in the applicable Body of Knowledge

Three hours granted for development and delivery for each classroom hour (i.e., 6 hour course = 18 hours)

Participate in development of questions for the CMRP or CMRT exam at a SMRPCO-sponsored item writing workshop

Actual hours spent in workshop

Other activity or learning experience in subject areas in the applicable Body of Knowledge

Hours must be submitted to SMRPCO and approved prior to the certification expiring

Complete work hours relevant to the subject areas described in the applicable Body of Knowledge

Up to 8 hours (CMRT) and 5 hours (CMRP) for each year of full-time work experience within the three-year renewal period

Recertification Application Audit

SMRPCO's recertification process is conducted on an honor system of reporting. As such, measures need to be in place to verify the accuracy of reporting. SMRPCO conducts an audit of five percent of applicants for the CMRP and CMRT exam. Under the audit, candidates must furnish additional documentation that supports compliance with recertification requirements. Candidates subject to auditing are chosen at random and will be contacted directly by SMRPCO staff. Candidates subject to auditing will have 60 days to provide additional documentation to support their recertification application. If SMRPCO staff determines documentation does not fulfill recertification application requirements, the candidate will have 30 days to provide more information. Failure to provide documentation within the specified time periods communicated by SMRPCO staff or failure to provide sufficient evidence of recertification activities will result in recertification being denied.

Appeals, Extensions and Inactive Status Requests

Appeals

A certificant who does not agree with SMRPCO's decision related to his/her recertification application may appeal the decision. Certificants should follow the SMRPCO appeals policy.

Extension Requests

An extension of the recertification deadline for extenuating circumstances may be granted for up to six months beyond the expiration date.

The certificant must submit a recertification extension request electronically on the SMRP website before the certification expires. The request must include a statement of extenuating circumstances, the number of recertification hours completed, and a detailed plan stating how all requirements will be fulfilled by the requested extended deadline.

The SMRPCO Chair will review all extension requests. If an extension is granted, the original expiration date will remain constant. If the extension is not granted, the individual is no longer certified and must cease promoting him or herself as being CMRP or CMRT certified. To earn the certification again, the individual must ensure eligibility and retake the exam.

Request for Inactive Status

Inactive status may be granted to candidates on a case-by-case basis for special circumstances. Examples of conditions that might necessitate inactive status include: pregnancy, illness, injury, military duties or personal hardship. An inactive status may be granted to a certificant for up to three years. During this time, the individual is not certified, cannot claim to be, nor use the CMRP or CMRT credential; however, any recertification hours taken during this period will count toward recertification.

The certificant must submit a request for inactive status in writing by emailing certify@smrp.org with the words "Request for Inactive Status" in the subject line. The request will be considered by the Certification Commission. If inactive status is granted, the Certification Commission will determine the length of time that the certificant has to meet the recertification requirements.

If the inactive status goes beyond three years after the expiration date of the original certification, the individual's record will be annotated as certification having expired in SMRPCO's records. If within this time frame, the individual desires to recertify, he/she must pay current recertification fee, and meet all current recertification requirements with appropriate documentation. Furthermore, the original expiration date will remain valid. If nothing has occurred within those three years, the individual's record will be identified in the SMRPCO's files as not certified.

Requirements Waiver

The recertification requirement may be temporarily waived by the Certification Commission under either of the following circumstances:

- **The individual has experienced catastrophic health or medical problems or has been caring for someone with catastrophic health or medical problems**
- **The individual has been called to active military duty**

A request for a waiver of the recertification requirements must be made in writing by emailing certify@smrp.org with the words "Recertification Requirements Waiver Request" in the subject line.

The Certification Commission will review all requests. If the individual is granted a waiver, the individual must meet the requirements when either of the following occurs:

- **When the catastrophic health or medical issue has been resolved**
- **The individual has returned from active military duty**

Once the conditions upon which the recertification waiver was approved no longer exist, the individual must complete the recertification process in the time that the recertification was required prior to the request for the waiver (e.g., If a waiver is granted three months prior to an individual's certification expiring, the individual will have three months to complete the recertification process or risk his or her certification lapsing).

SMRP CODE OF ETHICS

All persons who sit for any SMRPCO examination shall:

- **Agree to maintain the confidentiality of the examination content and to never disclose examination content to others. Prohibited conduct includes disclosure of exam content, removal of exam materials from the examination room, copying by photography, use of audio recording equipment, or any other means that could be used to transfer the content to others.**
- **Attest to their identity as the registered examinee, and not represent anyone other than themselves in the taking of the exam.**
- **Attest that the work and selections made on the subject examination are theirs and theirs alone.**

Those examinees that pass a SMRPCO examination (hereafter known as Certificants):

- **Pledge to represent their profession ethically and honorably. Conduct by a Certificant that is detrimental to the SMRPCO Certification program may result in revocation of said Certification. Examples of detrimental conduct include but are not limited to dishonesty, misrepresentation of professional qualifications, and certain illegal acts leading to felony conviction. Certificants have the right to appeal revocations of certification through due process as is described in the SMRPCO Policies and Procedures document.**
- **Represent their qualifications honestly, including their educational achievements and professional affiliations, and provide only those services which they are qualified to perform.**
- **Consistently maintain and improve professional knowledge and competence, striving for professional excellence through regular assessment of personal and professional strengths and weaknesses and through continued education training.**
- **Conduct their business and professional activities with honesty and integrity, and respect the inherent worth of all persons.**
- **Shall refuse to unjustly discriminate against clients.**
- **Safeguard the confidentiality of all client information, unless disclosure is required by law, court order, or is absolutely necessary for the protection of the public.**
- **Refrain, under all circumstances, from initiating or engaging in acts of moral turpitude.**
- **Avoid any interest, activity or influence which might be in conflict with the Certificant's obligation to act in the best interests of the client or the profession.**
- **Refuse any gifts or benefits that are purely for personal gain and not for the good of the client and which are intended to influence a referral or decision.**
- **Follow all policies, procedures, guidelines and requirements promulgated by the SMRPCO.**



IMPORTANT SMRPCO POLICIES AND AGREEMENTS

The SMRPCO Policies and Procedures document is the official record of all policies and procedures related to the SMRPCO certification programs. Below are the policies described within this document.

Appeals Policy

An appeal must be submitted electronically on the ____. The appeal must be submitted no later than 30 days after notification by SMRPCO of the adverse decision. All relevant supportive documentation must be included or referenced in the appeal submission.

First Level Review

The initial review of the appeal will occur within 10 business days of appeal submission. A response will be sent by SMRPCO staff within 10 business days of the initial determination. The initial response will be one of:

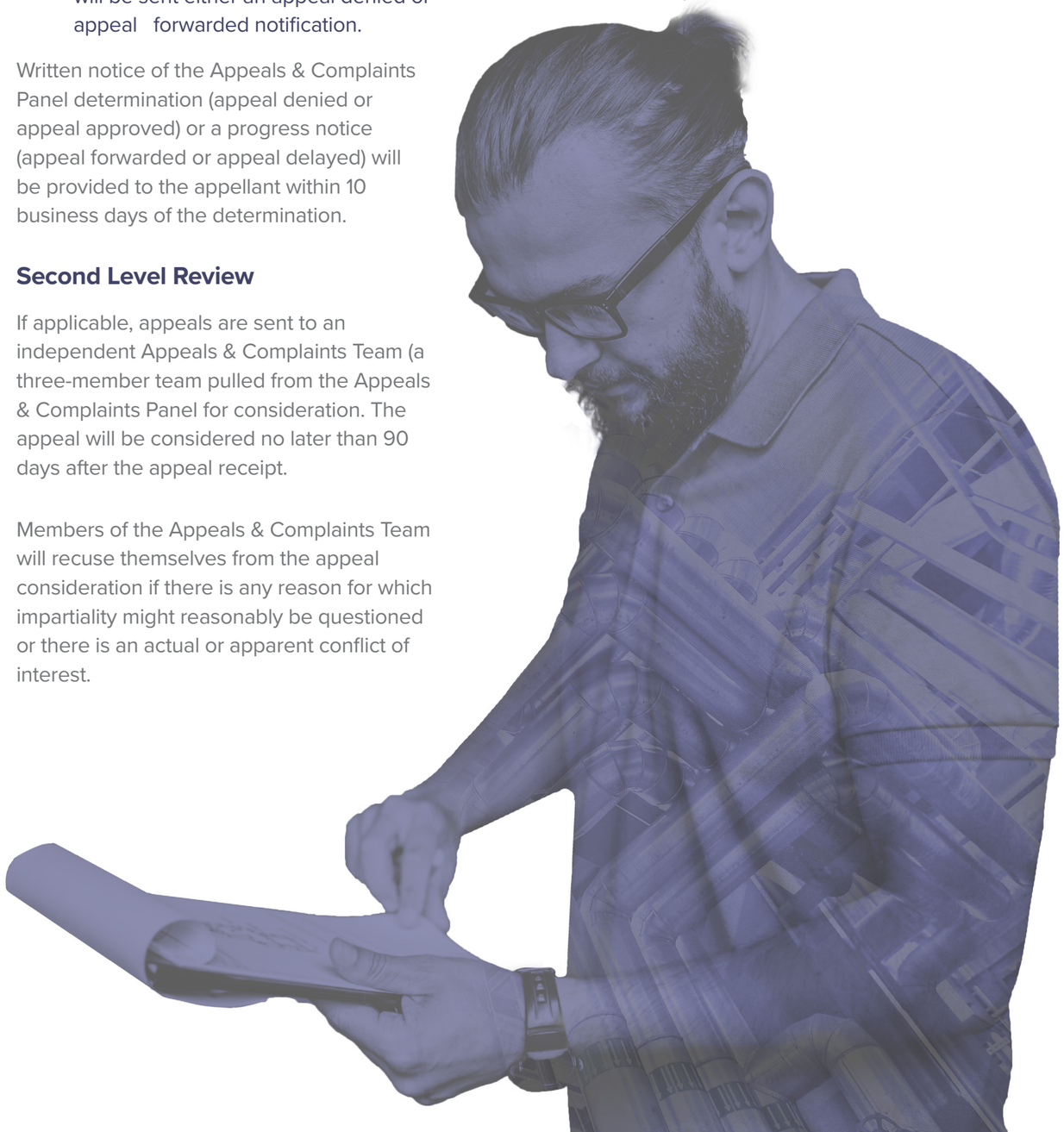
- **Appeal denied**
  - The response will be accompanied by an explanation for the denial and/or information on an alternate course of action where applicable. The denial will include information on the appellant's further recourse if the appellant wishes to pursue the appeal.
- **Appeal approved**
  - Appeal forwarded to the Appeals & Complaints Panel
- **Appeal delayed to provide time to gather further information**
  - Within 30 calendar days, the appellant will be sent either an appeal denied or appeal forwarded notification.

Written notice of the Appeals & Complaints Panel determination (appeal denied or appeal approved) or a progress notice (appeal forwarded or appeal delayed) will be provided to the appellant within 10 business days of the determination.

Second Level Review

If applicable, appeals are sent to an independent Appeals & Complaints Team (a three-member team pulled from the Appeals & Complaints Panel for consideration. The appeal will be considered no later than 90 days after the appeal receipt.

Members of the Appeals & Complaints Team will recuse themselves from the appeal consideration if there is any reason for which impartiality might reasonably be questioned or there is an actual or apparent conflict of interest.



The appeal will not include a hearing or any similar trial-type proceeding.

The function of the Appeals & Complaints Team in a given case is to review the decision being appealed based on the record that was presented at the time of the determination.

The Appeals & Complaints Team will review the appeal, including but not limited to taking into account the results of previous similar appeals, and make a determination on appeal action.

The second level response will be one of:

- **Appeal denied**
- **Appeal approved**
- **Appeal delayed to provide time to gather further information**

Within 30 calendar days, the appellant will be sent either an appeal denied or appeal forwarded notification.

Written notice of the Appeals & Complaints Team determination (appeal denied or appeal approved) or a progress notice (of appeal delayed) will be provided to the appellant within 10 business days of the determination.

Third Level Review

If an appellant feels his or her appeal was handled improperly by the staff or Appeals & Complaints Team, a procedural appeal may be filed with the Certification Commission.

The appeal will be considered no later than 90 days after the appeal receipt.

Members of the Certification Commission will recuse themselves from the appeal consideration if there is any reason for which impartiality might reasonably be questioned or there is an actual or apparent conflict of interest.

The appeal will not include a hearing or any similar trial-type proceeding.

The function of the Certification Commission in a given case is to review the handling of the appeal to determine if the SMRPCO policies and procedures were followed.

The procedural appeal response will be one of:

- **Appeal denied**
- **Appeal approved**
  - In such cases, a new Appeals & Complaints Team will be assigned to consider the full appeal again.
- **Appeal delayed to provide time to gather further information**
  - Within 30 calendar days, the appellant will be sent either a denial or approval notification.

Written notice of the Certification Commission determination (appeal denied or appeal approved) or a progress notice (of appeal delayed) will be provided to the appellant within 10 business days of the determination.

Ownership and Use of the Mark and Logo Policy

SMRPCO Marks and Logos

The CMRP, CMRT and SMRPCO mark and logo are the property of SMRP and SMRPCO. Permission to use the certification mark or logo is granted to certified persons at the discretion of SMRPCO for permissible uses only. The words “Certified Maintenance and Reliability (or M&R) Professional” initials or wording that infers the same meaning are also the property of SMRP and SMRPCO.

Persons Authorized to Use the Marks

Use of any SMRPCO certification marks and logos is limited to those persons who have been granted the certification by SMRPCO and who satisfy all maintenance and recertification requirements established by SMRPCO. Use of the mark and logo by individuals who have not been granted and maintained the certification is expressly prohibited.

Non-Assignability and Non-Transferability

Permission to use the certification marks and logos is limited to the certified person and shall not be transferred to, assigned to, or otherwise used by any other individual, organization, or entity.

Marks and Logos Use

Those persons who have been granted permission to use the certification mark and logo shall do so pursuant to the rules and guidelines established by SMRP and SMRPCO. Persons granted permission to use the certification mark and logo must familiarize themselves with the established rules and guidelines for use and must execute approved agreements setting forth such rules and guidelines for use.

The SMRPCO marks and logos may not be revised or altered in any way. They must be displayed in the same form as produced by SMRP and SMRPCO, and they cannot be reproduced unless such reproduction is identical to the mark provided by SMRPCO.

The initials “CMRP” and “CMRT” may be used on materials, such as business cards, stationery, letterhead and similar documents on which the name of the individual certified is prominently displayed to promote themselves personally as an individual certified in the maintenance and reliability profession.

Certificants may not use the CMRP or CMRT logo, the SMRP Certifying Organization logo or the words “Certified in the Maintenance and Reliability (or M&R) Professional” initials or wording with any other descriptive qualifier, such as endorsed, recommended, etc. SMRPCO logos may not be used on promotional materials promoting services as an instructor for preparation or training to prepare for any certification exam sponsored by SMRPCO.

The CMRP or CMRT logo, the SMRP Certifying Organization logo or the words “Certified in Maintenance and Reliability (or M&R) Professional” initials or wording that infers the same meaning may not be used in conjunction with any other product such as clothes, books or videos marketed or sold by other than SMRP or SMRPCO.

The mark or logo may not be used in any manner that could bring SMRP or SMRPCO into disrepute or in any way considered misleading or unauthorized. The mark or logo may not be used in any manner that would tend to imply a connection between any business and the certification which, in fact, may not exist. This includes any use of the mark or logo that the public might construe as an endorsement, approval or sponsorship by SMRPCO of a certificate holder’s business or any product or service thereof.

Suspension or Revocation of Permission to Use Mark or Logo

SMRP and SMRPCO retain the right, at its sole discretion, to suspend or revoke any person’s permission to use its certification mark or logo. In most circumstances, when SMRP or SMRPCO is informed that a person is misusing the certification mark or logo, SMRPCO will provide the person notice of the misuse and a reasonable opportunity to comply with SMRPCO’s rules and guidelines. However, SMRPCO retains the right to suspend or revoke privileges without notice and an opportunity to correct, particularly when the violation is of a gross nature and more immediate action is necessary to stop misuse.

Actions by SMRPCO to suspend or revoke use of the certification mark shall be communicated in writing to the person whose privileges are being suspended or revoked and to all other persons affected by the decision. SMRP and SMRPCO may also publicize its actions on its website and/or any other of its publications. Should any person continue use of SMRPCO’s certification marks or logos after notice of suspension or revocation, SMRP and SMRPCO shall seek full equitable and/or legal remedies through a court of competent jurisdiction.

CMRP EXAM OUTLINE

The Society for Maintenance and Reliability Professionals (SMRP) has created the Maintenance and Reliability Body of Knowledge. The foundation of the Maintenance and Reliability Body of Knowledge is the five pillars of knowledge: Business and Management, Manufacturing Process Reliability, Equipment Reliability, Organization and Leadership, and Work Management. The Maintenance and Reliability Body of Knowledge was developed by SMRP's Maintenance and Reliability Knowledge Committee using a rigorous development process. The current Maintenance and Reliability Body of Knowledge extends to level 2, the function level. Additional levels are under development and will be published periodically.

1.0 Business and Management

This subject area describes the skills used to translate an organization's business goals into appropriate maintenance and reliability goals that support and contribute to the organization's business results.

1.1 Create Strategic direction and plan for M&R operations

- Provide vision and direction
- Provide clear and measurable goals

1.2 Administer Strategic plan

- Develop support
- Obtain approval and resources
- Implement plans

1.3 Measure Performance

- Select key performance indicators
- Track and report

1.4 Manage organizational plan

- Develop change management process
- Communicate benefits

1.5 Communicate with stakeholders

- Provide management reports
- Inform staff
- Coordinate with operations

1.6 Manage environmental-health-safety risk

- Support community EHS goals
- Support security goals
- Conform to applicable regulations
- Provide EHS training

2.0 Manufacturing Process Reliability

This subject area relates maintenance and reliability activities to the manufacturing process of the organization to ensure that maintenance and reliability activities improve the manufacturing process.

2.1 Understand the applicable processes

- Document process flow
- Understand process parameters
- Understand quality specifications

2.2 Apply process improvement techniques

- Identify production losses
- Establish continuous improvement process

2.3 Manage effects of change to processes and equipment

- Establish change protocol
- Update documentation
- Update procedures

2.4 Maintain processes per applicable standards and regulations

- Understand industry standards
- Understand regulatory requirements
- Ensure compliance

3.0 Equipment Reliability

This subject area describes two kinds of activities that apply to the equipment and processes for which the maintenance and reliability professional is accountable. First are those activities used to assess the current capabilities of the equipment and processes in terms of their reliability, availability, maintainability, and criticality. Second are the activities used to select and apply the most appropriate maintenance practices, so that the equipment and processes continue to deliver their intended capabilities in the safest and most cost-effective manner.

3.1 Determine equipment reliability expectations

- Identify reliability goals
- Identify process expectations

3.2 Evaluate equipment reliability and identify improvement opportunities

- Measure and track performance
- Determine best-demonstrated performance
- Analyze gaps

3.3 Establish a strategic plan to assure reliability of existing equipment

- Identify appropriate analysis techniques
- Develop maintenance strategy and tactics

3.4 Establish a strategic plan to assure reliability of new equipment

- Establish reliability specifications
- Establish acceptance criteria
- Obtain complete documentation

3.5 Cost-justify selected plans for implementation

- Conduct cost-benefit analysis
- Communicate benefits
- Obtain approval

3.6 Implement selected plans to assure equipment reliability

- Apply reliability strategies
- Establish organization structure
- Provide resources

3.7 Review reliability of equipment and adjust reliability strategy

- Assess key performance indicators
- Analysis deviations
- Identify relevant best practices
- Implement continuous improvement

4.0 Organization & Leadership

This subject area describes processes for assuring that the maintenance and reliability staff is the most qualified and best assigned to achieve the maintenance and reliability organization goals.

4.1 Determine organizational requirements

- Review strategic plan
- Determine required skills
- Determine required staffing levels

4.2 Analyze organizational capability

- Inventory staff skills
- Determine performance gaps

4.3 Develop the organization structure

- Establish reporting channels
- Determine roles
- Determine responsibilities
- Manage reorganization

4.4 Develop personnel

- Provide training
- Obtain needed expertise
- Delineate career paths

4.5 Lead and manage people

- Develop leadership skills
- Assess performance
- Promote a cooperative work environment
- Facilitate communication

5.0 Work Management

This subject area focuses on the skills used to get the maintenance and reliability work done. It includes planning and scheduling activities, quality assurance of maintenance activities, stores and inventory management.

5.1 Identify, validate, and approve work

- Establish work identification processes
- Select and approve viable work

5.2 Prioritize work

- Develop formal prioritizing system
- Implement formal prioritizing system

5.3 Plan work

- Develop job package
- Including scope and procedures
- Including materials and tools
- Including testing

5.4 Schedule work

- Develop scheduling process
- Produce work schedule
- Balance resources
- Monitor backlog
- Manage break-in work
- Coordinate equipment access

5.5 Execute work

- Manage labor
- Manage material and services
- Control productivity
- Ensure EHS compliance

5.6 Document work

- Create post-work document process
- Record failure events and failure modes

5.7 Analyze work and follow-up

- Compare actual work with plan
- Identify variances

5.8 Measure work management performance

- Establish performance indicators
- Report schedule compliance and rework

5.9 Plan and execute projects

- Define scope
- Estimate project and life cycle costs
- Apply critical path methods
- Track progress
- Coordinate staffing

5.10 Use information technologies effectively

- Leverage capabilities of data historian
- Process control systems
- Condition monitoring software
- EAM,CMMS systems functionality

5.11 Manage resources and materials

- Control materials inventory
- Manage spares and equipment
- Establish MRO procurement process
- Manage contractors



CMRP PRACTICE QUESTIONS

1. Which one of the following is generally true?

a. Construction contractors are usually equally skilled at performing all maintenance tasks

b. Maintenance is often reduced through project designs that provide in-place spares for all rotating equipment and heat exchangers

c. Reliability Centered Maintenance can be applied on capital projects in the pre-construction stage to determine the maintenance plan

d. Most mechanics can easily alternate between doing capital project work and doing equipment diagnosis and repair work

2. What are the three most significant constraints when developing a Maintenance and Reliability organization?

a. Culture / People / Resources

b. Budget / Operations / People

c. Engineering / Human Resources / Budget

d. Culture / Engineering / Budget

3. Weibull (life data) analysis is primarily used for:

a. Maintainability analysis

b. Probability of failure determination

c. Life-cycle cost analysi

d. On time ratio calculations

4. A large manufacturing company installed some asset monitoring devices on some large motors that were deemed critical equipment. The monitoring devices provide engineering with vibration data, acoustic data, as well as operational performance data. What asset management strategy has the company selected for the motors?

a. OBM (Operational Based Maintenance/CM) (Corrective Maintenance)

b. PM (Preventive Maintenance/OBM) Operator Based Maintenance)

c. CBM (Conditioned Based Maintenance)/PDM) (Predictive Maintenance)

d. CBM (Condition Based Maintenance/CM) (Corrective Maintenance)

5. If a machine is run for 500 hours and five failures are observed during this period, what is the Mean Time Between Failure?

a. 500 hours

b. 0.01 hours

c. 2500 hours

d. 100 hours

6. Which of the following most effectively makes up the members of a Manufacturing Team?

a. Sales/Customer/Production/Supplier/Senior Management

b. Maintenance/Engineering/Production/Human Resources

c. Production/Maintenance/Supplier/Engineering

d. Senior Management/Production/Human Resources

7. A skills audit is undertaken to:

a. Help an organization understand skills in its industry

b. Help an organization understand skills it requires

c. Benchmark skills against other companies

d. Develop employee training plans for the next year

8. Of the following, what is the best method for measuring employee skills and training?

a. Maintain a skills inventory and tracking database

b. Ask employees to keep a training notebook

c. Keep records of all formal training courses taken

d. Have employees complete annual self-evaluations

9. When training maintenance workers, it is best to first:

a. List all the tasks the workers need to perform

b. Check the budget to set how much to spend per worker

c. Review the list of classes already taken by the workers

d. Give classes to all workers on basic skills

10. What relationship should Maintenance and Reliability Teams have with customers and suppliers for optimum effectiveness?

a. Purchasing should be the only communicators with suppliers
b. Management should be the only communicators with customers and suppliers
c. Team members should be involved in communicating with customers and suppliers
d. Sales should be the only department communicating with customers

11. Which of the following metrics definitions is not accurate?

a. Uptime - % of time you run producing quality product at design rate
b. Schedule compliance - how often mechanics are pulled off their current work to another task
c. MTBF - a measure or indicator of equipment life expectancy
d. Backlog - how long it takes to fix broken equipment

12. Which of the following does not support people development?

a. Providing feedback only when asked
b. Defining result areas, goals, and measurements
c. Coaching, feedback, and encouragement
d. Defining training and skills goals

13. From the following list, which is not a critical structural element of a strategic plan for maintenance and reliability?

a. Current levels of performance
b. Benefits available through implementation
c. Historical direction of the business
d. Vision of the future state

14. Which performance result best shows a maintenance and reliability manager that the scheduled maintenance activities being implemented are effective?

a. Hours spent on unscheduled maintenance have decreased
b. Maintenance cost per unit of production has decreased
c. Total annual maintenance cost has decreased
d. Production rate has increased

15. When the time period between the testing which detects a failure, for failures with significant economic consequences, and when life expectancy is highly variable, a good approach is:

a. More frequent periodic predictive testing
b. Structured preventive maintenance
c. On-line condition monitoring
d. Time based rebuild or change out

Answer Key:

1: C; 2: A; 3: B; 4: C, 5:D; 6: C, 7: B, 8: A, 9: A, 10: C, 11: D, 12: A, 13: C, 14: A, 15: C

CMRT EXAM OUTLINE

Subject Areas Addressed by the Certification Exam

Four major performance domains account for the examination's content. These four domains, as well as the task statements for each domain, are listed below:

Domain I: Maintenance Practices

Task 1: Adhere to safety, health, and environmental standards and policies by taking personal responsibility to prevent injury or illness from exposure to hazards. The candidate must demonstrate knowledge in the following:

1. Bloodborne pathogens
2. Confined space entry
3. Electrical safety
4. Emergency response (ER) and evacuation
5. Environmental compliance
6. Ergonomics
7. Eye protection
8. Fall protection
9. Fire safety
10. HAZCOM/MSDS
11. Hearing conservation
12. Ladder safety
13. Lockout/tagout procedures
14. Personal protective equipment (PPE)
15. Process safety management (PSM)
16. Respiratory protection
17. Rigging
18. Safety system and devices
19. Scaffolding

Task 2: Inform production control personnel about the maintenance activity required per company protocol to adjust the operations schedules. The candidate must demonstrate knowledge in the following:

1. Lockout/tagout procedures
2. Process overview
3. Work permits

Task 3: Perform the proper lockout/tagout procedures on equipment per applicable standards to ensure zero energy state prior to commencing maintenance work and minimize health, safety, and environmental hazards to employees and the community. The candidate must demonstrate knowledge in the following:

1. Lockout/tagout procedures
2. Multiple energy sources
3. Zero energy states

Task 4: Perform a pre-use inspection on maintenance tools and equipment using established standards and guidelines to ensure safe operation and to extend the life of the tools and equipment. The candidate must demonstrate knowledge in the following:

1. Cranes and hoists
2. Field machinery and tools
3. Ladder safety
4. Rolling stock/mobile equipment (e.g., mobile cranes, man-lift/scissor lift, forklift)
5. Shop machinery and tools
6. Rigging equipment (e.g., slings, shackles, eyebolts, chains, hooks)

Task 5: Use maintenance tools and equipment per manufacturers' specifications and established safety policies to ensure safety and efficiency. The candidate must demonstrate knowledge in the following:

7. Equipment and tool specifications
8. Established equipment and tool-safety policies and procedures

Task 6: Use measuring tools and equipment in a manner that will ensure accurate measurements to perform maintenance tasks properly. The candidate must demonstrate knowledge in the following:

1. Application of specific tools
2. Basic math (e.g., fractions, addition, subtraction, multiplication, division)
3. Calibration requirements for measurement tools (e.g., torque wrench, calipers, alignment tools)
4. Conversion of appropriate measurement and engineering units
5. Measurement principles (e.g., mass, force, motion, distance, acceleration, power, fluid, bulk)
6. Measurement tools (e.g., rulers, gauges, tapes, micrometer, calipers, lasers)

Task 7: Handle all maintenance materials and parts per established standards and procedures to prevent damage to the parts and equipment. The candidate must demonstrate knowledge in the following:

1. Company safety policies
2. Material handling techniques and procedures
3. Material storage procedures
4. Original equipment manufacturers' (OEM) instructions

Task 8: Maintain housekeeping by adhering to established site standards and by removing all maintenance-related parts and waste to ensure a safe and orderly job site. The candidate must demonstrate knowledge in the following:

1. Facility and regulatory policies on housekeeping
2. Hazards of improper housekeeping
3. Proper organization and cleaning of job site

Task 9: Document maintenance activities using the facility's maintenance management system to record history, assist with planning and scheduling, and support root-cause failure analysis. The candidate must demonstrate knowledge in the following:

1. Documentation systems (e.g., paper filing systems, computer filing systems, email)
2. Maintenance planning and scheduling

Domain II: Preventive and Predictive Maintenance

Task 1: Perform preventive and/or predictive maintenance according to the work plan to maximize mean time between failures. The candidate must demonstrate knowledge in the following:

1. Company safety, health, and environmental policies
2. Equipment function and use
3. Predictive maintenance procedures
4. Preventive maintenance procedures
5. Work plan requirements

Task 2: Apply predictive maintenance techniques by observing equipment performance and collecting ongoing performance data to maximize mean time between failures. The candidate must demonstrate knowledge in the following:

1. Company safety, health, and environmental policies
2. Function of equipment
3. Operation parameters for equipment, including baseline conditions
4. Predictive maintenance techniques and technologies (e.g., oil samples, vibration readings, thermographic equipment, ultrasonic testing)

Task 3: Lubricate equipment per the lubrication schedule and equipment specifications to ensure reliable performance and prevent damage. The candidate must demonstrate knowledge in the following:

1. Company safety, health, and environmental policies
2. Equipment specifications
3. Filtering systems
4. Lubricant specifications
5. Lubricating systems
6. Lubrication principles
7. Lubrication route

Task 4: Perform alignment checks on rotating equipment (e.g., pumps, fans, blowers, turbines, gearboxes, compressors) per equipment specifications to ensure reliable performance and prevent damage. The candidate must demonstrate knowledge in the following:

1. Company safety, health, and environmental policies
2. Equipment alignment techniques (e.g., laser, reverse, straight edge, rim and face)
3. Equipment functions
4. Thermal growth
5. Operation principles for rotating equipment

Task 5: Perform checks on safety systems and devices per equipment design specifications to ensure reliable operation and protect employees. The candidate must demonstrate knowledge in the following:

1. Company safety, health, and environmental policies
2. Consequences of bypassing safety systems
3. Equipment design specifications
4. Equipment functions (e.g., limit switches, photoelectric eyes)
5. Operation of safety systems

Domain III: Troubleshooting and Analysis

Task 1: Gather information relating to a maintenance request by reviewing the work order and/or interviewing operations personnel to determine the general nature of the problem. The candidate must demonstrate knowledge in the following:

1. Effective interpersonal relations
2. Equipment and/or processes
3. Maintenance work order systems

Task 2: Verify that the problem is valid by systematically testing and/or observing the equipment's performance, as conditions permit, to determine if a problem exists. The candidate must demonstrate knowledge in the following:

1. Function and use of the equipment
2. Process indicators (e.g., gauges, annunciators, Human Machine Interface [HMI] displays)

Task 3: Obtain appropriate technical documentation using facility resources to gain a full understanding of designed operating parameters and/or sequences. The candidate must demonstrate knowledge in the following:

3. Facility resources (e.g., CMMS, technical library, engineering files)
4. Operating parameters and sequences
5. Technical documentation (e.g., schematics, P&ID, blueprints, O&M manuals, SOP, MSDS)

Task 4: Investigate previous maintenance activities, as conditions require, by reviewing equipment history in order to identify information that will facilitate troubleshooting. The candidate must demonstrate knowledge in the following:

1. Facility maintenance record systems
2. Facility preventative maintenance scheduling programs or systems
3. Preventative maintenance techniques and theories (e.g., lubrication, seals and bearings, alignments)

Task 5: Identify the cause of the problem using a systematic process of elimination in order to determine what is causing the malfunction. The candidate must demonstrate knowledge in the following:

1. Equipment and/or process design parameters
2. Hazards involved with operating and/or maintaining specific process equipment
3. Systematic troubleshooting and analysis

Domain IV: Corrective Maintenance

Task 1: Verify troubleshooting analysis by disassembling and inspecting components using established procedures per applicable standards and guidelines in order to confirm that the identified corrective action is appropriate. The candidate must demonstrate knowledge in the following:

1. Common mechanical systems (e.g., lubrication, seals and bearings, alignment, power transmission, cams, cranks, pneumatics, hydraulics, thermodynamics, heat transfer, piping systems, steam systems)
2. Correct use of tools and equipment, including measuring devices
3. Equipment specifications
4. Equipment and component functions
5. Operation of equipment and components
6. Results of troubleshooting analysis
7. Specific equipment repair procedures, applicable standards, and guidelines

Task 2: Repair the malfunction by performing required corrective maintenance tasks per best maintenance practices to return the equipment to the desired operating condition. The candidate must demonstrate knowledge in the following:

1. **Common mechanical systems (e.g., lubrication, seals and bearings, alignment, power transmission, cams, cranks, pneumatics, hydraulics, thermodynamics, heat transfer, piping systems, fabrication, steam systems)**
2. **Correct use of tools and equipment, including measuring devices**
3. **Equipment specifications**
4. **Equipment and component functions (e.g., pumps, fans, blowers, turbines, gearboxes, compressors, fasteners, motors, piping systems, gaskets/ packing, drive systems, conveying systems)**
5. Equipment and component operation
6. Specific equipment repair procedures, applicable standards, and guidelines

Task 3: Monitor the equipment after it has been repaired while operating it under normal conditions in order to determine whether or not the repair was successful. The candidate must demonstrate knowledge in the following:

1. **Equipment and component functions (e.g., pumps, fans, blowers, turbines, gearboxes, compressors, fasteners, motors, piping systems, gaskets/ packing, drive systems, conveying systems)**
2. **Equipment and component operation**

Task 4: Release repaired equipment for return to service using standard operating procedures in order to resume normal operations. The candidate must demonstrate knowledge in the following:

1. Procedures for releasing equipment for return to service



CMRT PRACTICE QUESTIONS

1. The best way to assure that a full-face respirator has a positive seal is to place the palms of your hands:

a. Over the discharge and inhale
b. Over the inlet and inhale
c. On the front and press toward your face
d. On the bottom and push up

2. According to industry standards, at which minimum working height would an individual be required to wear a safety harness?

a. 3 feet
b. 4 feet
c. 5 feet
d. 6 feet

3. In OSHA regulations, the term point-of-operation protection device refers to what feature in maintenance?

a. Lockout-tagout
b. Machine guarding
c. Personal protective equipment
d. Pre-operational inspection

4. Which of the following is an example of a predictive maintenance task?

a. Changing oil on an hour meter set point
b. Changing V belts once a year on a fan drive
c. Lubricating equipment on a set schedule
d. Monitoring with a vibration equipment

5. The opening of a relief valve is caused due to an increase in:

a. Pressure
b. Temperature
c. Valve
d. Flow

6. There are often multiple reasons when equipment fails. What is the appropriate tool to use to determine the reason?

a. Cause and effect analysis
b. Equipment failure analysis
c. Process failure analysis
d. Root cause analysis

7. What instrument is used to check the quality of an electric motor's insulation resistance?

a. A megohmmeter
b. A multimeter
c. A volt-ohmmeter
d. A light meter

8. What is the main advantage of a flexible coupling over a rigid one?

a. They are able to accept shock loads
b. They are easier to install
c. They are less expensive
d. They compensate for some misalignment

9. What type of mechanical damage to a centrifugal pump can be caused by cavitation?

a. Pitting and erosion
b. Motor current under load
c. Premature gasket failure
d. Scaling and clogging

10. When performing an alignment on a new idler pulley on a belt conveyor, you must start with the belt in what load condition?

a. ½ full
b. ¾ full
c. Empty
d. Under-full

Answer Key:

1:B; 2: B; 3: B; 4: D; 5: A; 6: D; 7: A; 8: D; 9: A; 10: C



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