ASME QRO-1–2005

[Revision of ASME QRO-1–1994 (R2000)]

Standard for the Qualification and Certification of Resource Recovery Facility Operators

AN AMERICAN NATIONAL STANDARD



The American Society of Mechanical Engineers

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Date of Issuance: February 6, 2006

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FOREWORD

ASME published the QRO Standard (Qualifications of Resource Recovery Facility Operators) in response to public and regulatory interest in providing a certification process for operators of facilities that combust municipal solid waste and recover energy from that process.

The QRO Standard (the Standard) is referenced as part of the Clean Air Act Amendments of 1990 under 40CFR60, subparts Cb and Eb. As of January 2004, approximately 1,123 individuals hold Provisional certificates, and 523 individuals hold site-specific Operator Certificates under the Standard.

The Standard was first published in 1989. A revised edition was published in 1994, which deleted compost-specific and material science test questions from the outline of subject matter on the Provisional Examination. Also, the outline for the Operator Examination was revised. Addenda 1a, issued in 1996, broadened the description of the experience required for a Provisional Certificate. Addenda 1b, issued in 1998, revised the requirements for renewal of certificates and provided for renewal of a Provisional Certificate upon achieving an Operator Certificate. In addition, the provisions regarding expiration of certificates were revised. The Standard was reaffirmed in 2000.

This 2005 revision of the Standard was initiated on April 10, 2003. The Committee on Qualifications of Resource Recovery Facility Operators (the Committee) determined that a revision to the Standard was needed to clarify the provisions for renewal and transfer of Operator Certificates. Also, after a number of requests, the Committee agreed to expand the Standard to include all facilities that combust municipal solid waste, whether or not a facility recovers energy. The revised standard provides for a new form of certification for Combustion Operators of facilities that combust municipal solid waste but do not recover energy. Although the scope and coverage of the Standard now exceeds its title, the Committee chose to retain the original title of the Standard for continuity and historical reasons.

This Standard establishes criteria for three ASME certifications (provisional, operator, and combustion) and sets forth duties and qualifications for three facility positions (Chief Facility Operator, Shift Supervisor, and Combustion System Operator).

Applicants who meet proscribed qualification requirements and who then demonstrate knowledge and competence in accordance with the written examination described in the Standard will be issued Provisional and/or Combustion certificates. Both certifications are portable, in that they continue in effect even if the holder transfers employment to a different facility, but must be renewed every 5 years in accordance with certain requirements of the Standard.

Persons who hold a valid Provisional Certificate, who otherwise are qualified, and who have demonstrated knowledge and competence in accordance with a site-specific oral examination as described in the Standard will be issued an Operator Certificate. The Operator Certificate is valid for a 5-year period and is renewable, providing the applicant meets certain continuing requirements of the Standard, including competency with any significant changes in technology at the facility. The Standard further provides requirements for transfer of an Operator Certificate should the holder relocate employment to a facility with technology substantially equivalent to the facility at which the holder was employed when the original Operator Certificate was issued.

This Standard was developed under procedures accredited as meeting the criteria for American National Standards. The affiliation and professional experience of Committee members was balanced to assure that individuals from diverse competent and concerned interests had an opportunity to participate. The proposed standard was made available for public review and comment, which provided an opportunity for input from industry, academia, regulatory agencies, and the public-at-large.

This Standard will be maintained continuously as an American National Standard. Revisions that are provided with addenda service result from Committee consideration of factors, such as technological advances, new data, and changing environmental and industry needs.

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The QRO Standard Committee welcomes proposals for revisions to this Standard. Proposals should be as specific as possible and cite existing paragraph(s), proposed wording, and reason(s) for the proposed change(s).

The QRO Standards Committee and Subcommittees meet regularly. In accordance with ASME procedures, all meetings are open to the public, except meetings of the Subcommittees on Certification and Testing. Persons wishing to attend a meeting or to apply for membership on a committee or subcommittee should contact the secretary at the address below.

All correspondence should be addressed to

Secretary, Committee on Qualifications of
Resource Recovery Facility Operators (QRO
Standards Committee)
ASME
Three Park Avenue
New York, NY, 10016-5990

This Standard, which was approved by the QRO Standards Committee and ASME, was approved by ANSI and designated an American National Standard on March 9, 2005.

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Committee on Qualification of Resource Recovery Facility Operators (QRO)

(The following is a roster of the Committee at the time of approval of this Standard.)

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Standard for the Qualification and Certification of Resource Recovery Facility Operators

SECTION 1 INTRODUCTION

1.1 Scope and Purpose

1.1.1 Scope. This Standard covers the certification of persons who perform, or direct, operations of facilities that combust municipal solid waste (MSW).

1.1.2 Exclusions. This Standard excludes persons at facilities exclusively processing the following:

(a) a hazardous waste as defined by the U.S. Environmental Protection Agency

(b) pathological waste

(c) sewage sludges

(d) industrial waste from a manufacturing process, e.g., chemical waste, petroleum refinery bottoms, or sander dust

(e) MSW but with no combustion as part of the process

NOTE: This Standard does not cover the certification or validation of facility operating procedures, operating practices, performance, or compliance with permit requirements.

1.1.3 Purpose. This Standard provides the qualifications and other requirements that must be demonstrated in the certification process by persons who operate facilities that combust MSW.

1.2 Definitions

This section defines various terms used in this Standard.

municipal solid waste (MSW): solid waste generated from households, residential, and commercial establishments.

solid waste: unwanted or discarded materials, including solid, liquid, semi solid, or contained gaseous materials.

solid waste combustion facility: any setting of equipment (with or without pre- or postcombustion materials recovery or heat recovery processes) designed, permitted, and operated so as to combust MSW under controlled conditions.

1.3 Forms of Certification

The forms of certification listed below are applicable only to the respective positions described in paras. 2.1.1 through 2.1.3 of this Standard.

1.3.1 Provisional. This certification is granted to a qualified applicant who passes an examination. It is not facility specific but is a prerequisite to obtain Operator certification. Provisional certification expires after 5 years unless renewed in accordance with para. 4.5.1 of this Standard.

1.3.2 Operator. This certification is granted to a qualified applicant after passing an oral examination that tests the applicant's knowledge of the operations of the solid waste combustion facility that employs the applicant and requires the holder of the certification to remain current on changes to the facility that are material to its operation and safety. Operator certification may be issued to individuals who perform the duties of either Chief Facility Operator (CFO) as described in para. 2.1.1 or Shift Supervisor (SS) as described in para. 2.1.2. Operator certification is granted for 5 years and is renewable in accordance with para. 4.5.2 of this Standard.

1.3.3 Combustion. This certification is granted to a qualified applicant who passes an examination that concentrates on MSW characteristics and combustion processes. Combustion certification may be issued to individuals who perform the duties of Combustion System Operator (CSO) as described in para. 2.1.3. It is not facility specific nor a prerequisite, or substitute, for any other certification in this Standard. Combustion certification expires after 5 years unless renewed in accordance with para. 4.5.3 of this Standard.

NOTE: The Combustion System Operator certification is intended for facilities that combust municipal solid waste without heat recovery.

SECTION 2 DUTIES AND QUALIFICATIONS

2.1 Duties

This subsection outlines the essential duties and responsibilities of the positions of Chief Facility Operator, Shift Supervisor, and Combustion System Operator of a solid waste combustion facility for the purpose of identifying facility personnel to whom this Standard applies. Other operating positions in solid waste combustion facilities are not addressed by this Standard.

2.1.1 Chief Facility Operator. The Chief Facility Operator is in direct charge and control of the operation

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of a solid waste combustion facility and is responsible for overall on-site supervision, technical direction, management, and performance of the facility, including, but not limited to, the following:

(a) overall operation, maintenance, and performance

(b) operation in accordance with established policies and procedures

(c) ensuring personnel are qualified and certified as required and trained whenever applicable federal, state, and local environmental regulations or technology, policies, or procedures are changed

(d) ensuring operation is consistent with applicable federal, state, and local environmental requirements

(e) communicating with regulatory agencies

(f) ensuring policies and procedures for proper and safe operations are formulated and updated periodically

2.1.2 Shift Supervisor. The Shift Supervisor is in direct charge and control of the operation of a solid waste combustion facility during an assigned shift, including, but not limited to, the following:

(a) supervising, training, and monitoring performance of personnel during an assigned shift

(b) maintaining records of operations, including operational changes and abnormalities, and reports submitted to the Chief Facility Operator

(c) authorizing issuance of work orders for equipment repair and maintenance

(d) ensuring that the facility is operated consistent with applicable federal, state, and local environmental requirements

(e) monitoring operations in accordance with established policies and procedures

(f) undertaking actions to correct upsets or emergencies

(g) ensuring a safe workplace

(h) communicating operational status with the relieving shift at shift turnover

2.1.3 Combustion System Operator. The Combustion System Operator of a solid waste combustion facility is the principal person responsible for

(a) controlling the MSW feed to the combustor

(b) controlling the facility's combustion process in order to maintain operations in accordance with the design, operating, and permit limitations applicable to the facility

2.2 Qualifications

This subsection sets forth qualifications that must be met prior to receiving certification under this Standard.

2.2.1 Provisional Certification. The qualifications for Provisional certification are as follows:

(a) high school diploma or equivalent

(b) 3 years of experience in operations of a solid waste combustion facility or 5 years of experience in occupations concerned with the design, start-up, operation, or maintenance of engines, boilers, turbines, air compressors, motors, generators, conveying equipment, or their related auxiliaries which supply power, heating, or cooling service to an industrial, maritime, or commercial process or facility

(c) an understanding of solid waste combustion facility operations adequate to pass an examination that covers the body of knowledge listed in para. 3.1

NOTE: Completion of a baccalaureate degree in physical science or engineering, or 60 credits of course work in the subjects listed below from an institute accredited to issue degrees, may be substituted for up to 2 of the 5 years of non solid waste combustion facility experience in para. 2.2.1(b).

(a) advanced mathematics

(b) chemistry

(c) fluid dynamics

(d) thermodynamics

(e) materials science

(f) combustion theory

(g) environmental, mechanical, civil, chemical, or electrical engineering

2.2.2 Operator Certification. The qualifications for Operator certification are as follows:

(a) a valid Provisional Certificate at the time application is made for operator certification.

(b) prior to taking the examination, completion of at least 6 months of employment performing the duties listed in paras. 2.1.1 or 2.1.2 in the solid waste combustion facility where the applicant is employed.

(c) an understanding of the solid waste combustion facility operations adequate to pass a site specific oral examination that covers a detailed body of knowledge specific to that solid waste combustion facility, which shall include, but not be limited to, an understanding of control room operations and boiler or turbine operations and applicable federal, state, and local environmental requirements. This examination is described in para. 3.2.

2.2.3 Combustion Certification. The qualifications for Combustion certification are as follows:

(a) high school diploma or equivalent

(b) 2 years of experience in industrial processes or operations of machinery

(c) an understanding of solid waste combustion facility operations adequate to pass an examination that covers the body of knowledge listed in para. 3.3

NOTE: The Combustion Certificate is not a prerequisite, nor may it substitute, for any other certification under this Standard.

SECTION 3 TESTING REQUIREMENTS AND PROCEDURES

3.1 Examination for Provisional Certification

The examination shall be a 3-hr examination of 100 to 150 questions. The examination shall be structured

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as a closed book, multiple choice examination covering subject matter in the following three areas:

(a) 25% of the questions on solid waste collection, transfer, and management topics

(1) municipal solid waste composition

(2) collection techniques

(3) seasonal, industrial, and legislative impact on the composition of refuse

(4) the impact on the composition of refuse due to composting, source reduction, and recycling

(5) landfills

(6) ash handling, treatment, testing, and disposal

(7) environmental regulation and requirements

(b) 25% of the questions on theory topics

(1) general chemistry

(2) thermodynamics

(3) combustion

(4) mechanical and electrical operation and technology

(5) air pollution control technology

(6) continuous emissions monitoring

(c) 50% of the questions on the operation of a solid waste combustion facility topics

(1) material handling equipment

(2) boiler operations

(3) generator and turbine operations

(4) control room operations

(5) general operations and maintenance procedures and techniques

(6) continuous emissions monitors and their calibration

(7) ash handling, treatment, testing, and disposal operations

(8) worker safety

An applicant must achieve at least a 70% grade overall and no less than 50% in each of the three areas. An applicant may take this examination no more than twice in a 6-month period.

NOTE: The applicant is referred to Mandatory Appendix I-2 for further description of the examination.

3.2 Site-Specific Examination for Operator Certification

3.2.1 Oral Examination. The site-specific examination shall be an oral examination administered, whenever possible, at the solid waste combustion facility where the applicant is employed and shall be a test on knowledge of the operational, preventive maintenance, and safety procedures and practices of the facility. A candidate who fails the examination may retake the examination only after an additional 6 months of employment performing the duties listed in para. 2.1.1 or 2.1.2 in the solid waste combustion facility for which the certificate would be valid.

With the permission of the applicant, a representative from the facility shall be allowed to observe the site-specific oral examination.

3.2.2 Subject Matter. The site-specific oral examination shall test the following knowledge areas:

(a) refuse and ash handling

(b) combustion processing

(c) steam cycle

(d) electrical

(e) environmental controls

(f) safety

(g) administrative policy (Chief Facility Operator only)

NOTE: The applicant is referred to Mandatory Appendix I-3 for further guidance on the examination.

3.2.3 Grading of Examination. The grading of the site-specific examination shall be as follows:

(a) The site specific examination shall be graded and a written record made by each member of a board of examiners.

(b) Oral questions and answers shall be recorded electronically.

(c) The board of examiners shall evaluate candidates for Operator certification using the following criteria:

(1) technical knowledge

(2) ability to solve problems

(3) understanding of integrated facility operations

(d) A candidate's answers shall be graded on a pass/fail basis according to ASME guidelines.

(e) All members of the board of examiners must pass the applicant in each knowledge area for Operator certification to be granted.

3.2.4 Board of Examiners. The board of examiners shall consist of three members, one each from ASME, the solid waste industry, and the regulatory agency or jurisdictional authority applicable to the facility. ASME shall have discretion to provide a substitute for the regulatory agency or jurisdictional authority in the event a board member from that category is unavailable.

All members of the board of examiners shall comply with the ASME requirements on proprietary and confidential information.

3.3 Examination for Combustion Certification

The examination shall be a 3-hr examination made up of 75 to 130 questions. The examination shall be a closed book, multiple choice examination as follows:

(a) 30% of the questions on solid waste collection, transfer, and management topics

(1) municipal solid waste composition

(2) collection techniques

(3) seasonal, industrial, and legislative impact on the composition of refuse

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(4) the impact on the composition of refuse due to composting, source reduction, and recycling

(5) landfills

(6) ash handling, treatment, testing, and disposal

(7) environmental regulation and requirements

(b) 30% of the questions on theory topics

(1) general chemistry

(2) thermodynamics

(3) combustion

(4) mechanical and electrical operation and technology

(5) air pollution control technology

(6) continuous emissions monitoring

(c) 40% of the questions on operation of a solid waste combustion facility topics

(1) material handling equipment

(2) furnace and combustion chamber operations

(3) control room operations

(4) general operations and maintenance procedures and techniques

(5) continuous emissions monitors and their calibration

(6) ash handling, treatment, testing, and disposal operations

(7) worker safety

To pass the examination, a candidate must achieve at least a 70% grade overall and no less than 50% in each of the three areas.

NOTE: The applicant is referred to Mandatory Appendix I-4 for further guidance on the examination.

SECTION 4 CERTIFICATION REQUIREMENTS AND PROCEDURES

4.1 Provisional Certificate

A Provisional Certificate indicates that the holder has demonstrated general knowledge of solid waste combustion facilities. Provisional Certificates expire 5 years after issue unless renewed in accordance with para. 4.5.1 of this Standard. The Provisional Certificate is a prerequisite for Operator certification.

4.1.1 Application Process. Each applicant for a Provisional Certificate shall complete a written application that allows for verification by ASME that the applicant's education and experience meet the requirements of this Standard (para. 2.2.1). The application shall include a brief history of any previously held Provisional Certificates. See Nonmandatory Appendix A for additional information on the procedure for applying for certification.

4.1.2 Provisional Certificate Issuance. Each qualified applicant who passes the examination shall be issued a Provisional Certificate containing the following information:

(a) identification as a Provisional Certificate

(b) individual's full name

(c) individual's photograph

(d) effective and expiration dates

(e) certificate number to ensure traceability and accuracy

(f) signature of a duly authorized ASME designee

ASME shall maintain a publicly available list of certificate holders.

4.2 Operator Certificate

An Operator Certificate indicates that the holder has demonstrated sufficient detailed knowledge to operate a solid waste combustion facility properly as described in this Standard. The certificate is facility specific. ASME may reissue an Operator Certificate following a certificate holder's transfer to a different facility as described in para. 4.4.2 of this Standard. The certificate shall expire 5 years after issuance unless renewed in accordance with para. 4.5.2 of this Standard.

4.2.1 Application Process. Each applicant for an Operator Certificate shall complete a written application that allows for verification by ASME that the applicant's experience meets the requirements of this Standard (para. 2.2.2). Applications shall include a brief history of all previously held Operator Certificates. See Nonmandatory Appendix A for additional information on the procedure for applying for certification.

4.2.2 Operator Certificate Issuance. Each qualified applicant who passes an Operator certification examination will be issued an Operator Certificate containing the following information:

(a) identification as an Operator Certificate

(b) individual's full name

(c) individual's photograph

(d) applicant's position (Shift Supervisor or Chief Facility Operator) as determined by comparing applicant's actual duties and responsibilities with para. 2.1.1 or 2.1.2 of this Standard

(e) name and location of the facility where the applicant is employed

(f) certificate number to ensure traceability and accuracy

(g) effective and expiration dates

(h) signature of a duly authorized ASME designee

ASME shall maintain a publicly available list of certificate holders.

4.2.3 Responsibility to Notify ASME. A change in the name or ownership of a facility shall not invalidate a certificate. A certificate holder shall notify ASME within 60 days of a change in facility ownership and/or name, and ASME shall revise its records and reissue the certificate with the updated facility information.

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4.3 Combustion Certificate

A Combustion Certificate indicates that the holder has demonstrated general knowledge of the composition and collection of municipal solid waste, the impact of seasonal changes and precombustion processes on the combustion of MSW, and knowledge of various combustion processes and optimization of those processes using MSW as a fuel source.

4.3.1 Application Process. Each applicant for a Combustion Certificate shall complete a written application. The application form shall request sufficient information to allow for verification by ASME that the applicant's education and experience meet the requirements of this Standard. See Nonmandatory Appendix A for additional information on the procedure for applying for certification.

4.3.2 Combustion Certificate Issuance. Each qualified applicant who passes the examination shall be issued a Combustion Certificate containing the following information:

(a) identification as a Combustion Certificate

(b) individual's full name

(c) individual's photograph

(d) effective date

(e) certificate number to ensure traceability and accuracy

(f) signed by a duly authorized ASME designee

ASME shall maintain a publicly available list of certificate holders.

4.4 Certificate Transfers

This subsection establishes the requirements to transfer certificates to another facility.

4.4.1 Provisional Certification. A Provisional Certificate is not facility specific and therefore is not required to be transferred.

4.4.2 Operator Certification. The holder of an Operator Certificate may apply to transfer certification to another facility of similar technology provided that the holder demonstrates employment at the first facility has not been interrupted for more than 6 months (cumulative) during the validity of certification. To transfer an Operator Certificate to a solid waste combustion facility of dissimilar technology, the requirements of paras. 2.2.2(b) and (c) shall be met for the new facility. Procedures for certificate transfers, including supporting documentation required from an applicant's supervisor, are available from ASME. Requests for transfer must be submitted in writing to ASME no later than 60 days from the date employment commences at the facility for which a transfer is requested. Applications for transfer will not be accepted after this 60-day period. When ASME determines that a transfer is appropriate, the certificate will be renewed for a 5-year period starting from the date of employment at the new facility.

4.4.3 Combustion Certification. A Combustion Certificate is not facility specific and therefore not required to be transferred.

4.5 Certificate Renewal

Operator, Provisional, and Combustion Certificates expire unless renewed pursuant to the requirements of this subsection. Expired certificates cannot be reinstated. The holder of an expired certificate must reapply to ASME and meet the requirements of this Standard in order to obtain a new and valid certificate.

4.5.1 Renewal of Provisional Certification. Provisional certification can be renewed subject to the following requirements:

(a) Employment. Demonstration of employment as identified in para. 2.2.1(b) or in management, operation, maintenance or engineering of a solid waste combustion facility for at least three of the last 5 years.

(b) With Operator Certification. Upon obtaining or renewing an Operator Certificate, provisional certification shall be automatically renewed and the expiration date of the Provisional Certificate adjusted to coincide with the expiration date of the Operator Certificate.

4.5.2 Renewal of Operator Certification. Renewal of the Operator Certificate may be by retest or through a written submission. A renewal by written submission must satisfy ASME that the certificate holder has maintained knowledge of the indicated facility since the certificate was last issued and has acquired detailed knowledge of any facility component and permit changes that occurred during the previous 5 years. Procedures for renewal by written submission, including supporting documentation required from an applicant's supervisor, shall be available from ASME. Operator certification shall be renewed subject to the following requirements:

(a) Employment. Demonstration of employment at the solid waste combustion facility for at least 3 of the last 5 years or a cumulative 3 years of experience with duties as described in para. 2.1.1 or 2.1.2 within 5 years from the date the certificate was last issued.

(b) Knowledge. Demonstrate knowledge of operations required to comply with any revisions to applicable federal, state, and local environmental requirements currently applicable to the solid waste combustion facility for which the Operator Certificate would be valid, as well as adequate knowledge of operations related to any significant technical or design modification made to the solid waste combustion facility.

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4.5.3 Renewal of Combustion Certification. A Combustion Certificate can be renewed subject to the demonstration of employment with the duties and qualifications in paras. 2.1.3 and 2.2.3 for 3 of the 5 years preceding expiration.

4.5.4 Renewal Notification to ASME. The Certificate Holder shall submit the application for renewal of certification to ASME prior to the certificate expiration date. If provided to ASME 60 days prior to the expiration date, ASME may extend such certification up to 120 days to process a renewal application.

4.6 Revocation of Certification

Combustion, Provisional, or Operator Certificates may be revoked by ASME if false or inaccurate information is found to have been provided during the application or certification process.

4.7 Appeals

Appeals regarding certification under this Standard shall be conducted in accordance with ASME's appeal policies and procedures.

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MANDATORY APPENDIX I
EXAMINATION GUIDELINES

I-1 INTRODUCTION

This Appendix delineates the knowledge and abilities suggested for achieving certification in accordance with this Standard.

I-2 PROVISIONAL CERTIFICATE EXAMINATION GUIDELINES

The examination for a Provisional Certificate will cover the following topics:

(a) characteristics that make certain types of waste unprocessible in the facility

(b) waste conditions that have an impact on handling, processing, feeding, or combustion

(c) solid waste and residue landfilling

(d) laboratory procedures, such as testing water samples

(e) principles of combustion

(f) waste handling, processing, and feeding equipment design and operation

(g) boiler designs

(h) design and operation of facility waste water treatment equipment

(i) interactions among the major facility systems

(j) weigh scale equipment operation

(k) operation of boilers and auxiliaries

(l) operation of deaerator systems, cooling water chemistry, and feed water systems

(m) the startup, shutdown, and operating modes of a turbine generator and its auxiliaries, including condenser and cooling tower systems

(n) the operation of steam, hot water, and/or chiller systems, including load control, and communications with users

(o) operation of ash handling equipment

(p) the importance of planned and preventive maintenance programs required to maintain facility electrical, mechanical, and instrument equipment in optimum, reliable operating condition

(q) implementation and maintenance of electrical, mechanical, and instrumentation maintenance logging

(r) safe procedures and practices

I-3 OPERATOR CERTIFICATE EXAMINATION GUIDELINES

I-3.1 Chief Facility Operator

An applicant with duties as described in para. 2.1.1 of this Standard may take the examination for an Operator Certificate. The examination will test the following topics: refuse and ash handling, combustion processing, steam cycle, electrical, environmental controls, safety, and administration. Within these topics, the following areas will be covered:

(a) Permits

(1) environmental permit conditions (air quality, residues, wastewater, cooling water, solid waste, and other effluents)

(2) operating permits and licenses

(3) applicable federal, state, and local environmental requirements relating to facility receipt of solid and liquid wastes for combustion

(b) Waste

(1) types of waste materials from household, industrial, and commercial sources and the sources of the waste

(2) recognition, separation, safe handling, and disposal of hazardous waste components which may appear in the waste stream

(3) sources of wastes delivered to the facility

(4) procedure for acceptance and recording of waste received, bypassed, and disposed by the facility

(5) direction of people and vehicles delivering waste to the facility

(c) General

(1) safe working procedures for spill and fire control

(2) general housekeeping to maintain a healthy facility environment, including noise, odor, and spillage control

(3) emergency action plans to respond safely and promptly to fire, explosion, medical, and environmental incidents

(4) the overall facility design

(5) overall operation, maintenance, and performance of the facility

(6) understanding job duties and responsibilities of subordinates

(7) formulation and updating of policies and procedures for proper facility operations

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(d) Operation

(1) combustion process characteristics and control in relationship to the types and compositional variation of wastes to be burned

(2) steam generation process and characteristic for the specific facility design

(3) occupational hazards particular to the handling of wastes, residues, and chemicals utilized in the facility

(4) operation of the pollution control systems to satisfy permit conditions

(5) processes and procedures for adjusting boiler feedwater and cooling water chemistry to meet facility design specification

(6) calibration, continuous monitoring, and notification requirements for air quality control to meet permit specifications

(7) design and operation of the boiler feedwater and cooling water treatment systems

(8) procedures for starting up and shutting down the facility equipment, including the boiler, turbine generator, and air quality control equipment

(9) implementation and maintenance of facility operational logs and communications

(10) application and operation of control room instrumentation

(e) Ash

(1) ash composition and characteristic

(2) ash quality requirements for transport and landfilling

(3) ash residue procedures

I-3.2 Shift Supervisor

An applicant with duties as described in para. 2.1.2 of this Standard may take the examination for an Operator Certificate. The examination will test the following topics: refuse and ash handling, combustion processing, steam cycle, electrical, environmental controls, and safety. Within these topics, the following areas will be covered:

(a) Permits

(1) environmental permit conditions (air quality, residues, wastewater, cooling water, solid waste, and other effluents)

(2) operating permits and licenses

(3) applicable federal, state, and local environmental requirements relating to facility receipt of solid and liquid wastes for combustion

(b) Waste

(1) types of waste materials from household, industrial, and commercial sources and the sources of the waste

(2) recognition, separation, safe handling, and disposal of hazardous waste components which may appear in the waste stream

(3) sources of wastes delivered to the facility

(4) weigh scale equipment operation

(5) waste that is unprocessible in the facility

(6) waste conditions that have an impact on handling, processing, feeding, or combustion and measures to control this

(7) operation of tipping floor processing, handling, and feeding equipment

(8) procedure for acceptance and recording of waste received, bypassed, and disposed by the facility

(9) direction of people and vehicles delivering waste to the facility

(c) General

(1) safe working procedures for spill and fire control

(2) general housekeeping to maintain a healthy facility environment, including noise, odor, and spillage control

(3) emergency action plans to respond safely and promptly to fire, explosion, medical, and environmental incidents

(4) the overall facility design

(5) overall operation, maintenance, and performance of the facility

(6) understanding job duties and responsibilities of subordinates

(7) formulation and updating of policies and procedures for proper facility operations

(d) Operation

(1) combustion process characteristics and control in relationship to the types and compositional variation of wastes to be burned

(2) steam generation process and characteristic for the specific facility design

(3) occupational hazards particular to the handling of wastes, residues, and chemicals utilized in the facility

(4) operation of the pollution control systems to satisfy permit conditions

(5) processes and procedures for adjusting boiler feedwater and cooling water chemistry to meet facility design specification

(6) calibration, continuous monitoring, and notification requirements for air quality control to meet permit specifications

(7) design and operation of the boiler feedwater and cooling water treatment systems

(8) procedures for starting up and shutting down the facility equipment, including the boiler, turbine generator, and air quality control equipment

(9) implementation and maintenance of facility operational logs and communications

(10) application and operation of control room instrumentation

(11) operation of the boiler and its auxiliaries

(12) operation of the facility waste water treatment system

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(13) startup and shutdown of all facility equipment, particularly the boiler, turbine generator, and air quality equipment and auxiliaries

(14) control room equipment, instrumentation, control, display and logging, and communications within the facility

(15) operation and maintenance of the air pollution control equipment and instrumentation

(16) initiation and signoff of all electrical, mechanical, and instrumentation maintenance work orders

(17) operation of the turbine generator, its auxiliaries, and condenser/cooling water systems

(18) operation, control, and communications with user interfaces for steam, hot water, and chiller systems

(19) inspection and testing procedures for all facility equipment

(20) operation of the control room equipment for control, display, and logging

(21) impact and control of boiler upsets on steam generation and air quality

(e) Ash

(1) ash composition and characteristic

(2) ash quality requirements for transport and landfilling

(3) ash residue procedures

(4) ash handling equipment operation

I-4 COMBUSTION CERTIFICATION GUIDELINES

An applicant having the qualifications and duties as described in paras. 2.1.3 and 2.2.3 may take the examination for a Combustion Certificate. The exam will cover the following topics:

(a) characteristics that make certain types of waste unprocessible in the facility

(b) waste conditions that have an impact on handling, processing, feeding, or combustion

(c) solid waste and residue landfilling

(d) laboratory procedures, such as testing water samples

(e) principles of combustion

(f) waste handling, processing, and feeding equipment design and operation

(g) design and operation of facility waste water treatment equipment

(h) interactions among the major facility systems

(i) weigh scale equipment operation

(j) operation of combustion chamber

(k) operation of ash handling equipment

(l) the importance of planned and preventive maintenance programs required to maintain facility electrical, mechanical, and instrument equipment in optimum, reliable operating condition

(m) implementation and maintenance of electrical, mechanical, and instrumentation maintenance logging

(n) safe procedures and practices

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MANDATORY APPENDIX II
INTERPRETATIONS

On written request (only), the QRO Standards Committee will render an interpretaion of any requirement of the Standard. The request should be as clear as possible and include the applicable paragraph(s) in the Standard and phrased as a question requesting interpretation of a specific requirement, not a request for approval of a specific situation. Requests not in this format may be returned to the sender or rewritten by the Standards Committee, or a subcommittee thereof, which may change the intent of the request.

ASME procedures provide for reconsideration of any interpretation if, or when, additional factual information is available for consideration. Persons believing they are aggrieved by an interpretation may appeal to the cognizant ASME committee or subcommittee.

All correspondence should be addressed to

Secretary, Committee on Qualifications of
Resource Recovery Facility Operators (QRO
Standards Committee)
ASME
3 Park Avenue
New York, NY, 10016-5990

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NONMANDATORY APPENDIX A
APPLYING FOR CERTIFICATION

Application forms and information regarding Provisional, Operator, and Combustion certifications are available at
http://www.asme.org/Codes/CertifAccred/Certification/

Application forms and information may also be obtained by submitting a request to

ASME
Conformity Assessment Department
3 Park Avenue
New York, NY 10016-5990

The following will be required to be submitted with the application:

(a) nonrefundable administrative filing fee

(b) examination and registration fees, which may be refundable

(c) two face-view photographs of the applicant taken within the last 6 months and measuring 2 in.^{2} (51 mm)

Upon acceptance of the completed application, ASME will notifiy the applicant. Rejected applications will be returned to applicants advising of the deficiency and/or requesting additional information.

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ASME QRO-1–2005

ISBN 0-7918-2972-3





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