ASME QMO-1-2000
(Revision of ASME QMO -1-1993)

STANDARD FOR THE QUALIFICATION AND CERTIFICATION OF MEDICAL WASTE INCINERATOR OPERATORS

AN AMERICAN NATIONAL STANDARD



The American Society of Mechanical Engineers

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Date of Issuance: August 10, 2001

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FOREWORD

This Standard includes the requirements for qualification and certification of medical waste incinerator operators. It provides for the two types of operating personnel: Operators and Special Class Operators. Certification is based on three components: training, experience or demonstration of acceptable skills and ability, and passing a written examination.

The standard addresses certification of operators of medical waste incinerators with air pollution control devices and heat recovery. The certification is not site specific and may be applied to the operation of a different facility.

This Standard serves as a means for complying with federal, state, and local regulations that require operators to be certified. The requirements of the standard should be taken into consideration when drafting and enforcing these regulations.

The standard is intended to enhance public health and safety. Revisions result from committee consideration of factors such as technological advances, new data, and changing environmental and industry needs. Revisions do not imply that previous editions were inadequate.

This Standard, which was approved by the ASME QMO Committee, was approved by ANSI and designated an American National Standard on October 9, 2000.

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STANDARD FOR THE QUALIFICATION AND CERTIFICATION OF MEDICAL WASTE INCINERATOR OPERATORS

1 INTRODUCTION

1.1 Scope

This Standard covers the qualification and certification of operators of hospital, medical, and infectious waste incinerators (HMIWI).

1.2 Purpose

This Standard provides requirements to be used in certifying operators of HMIWI facilities. These requirements recognize the knowledge, training, and experience in the physical operation of a facility needed to comply with the facility's operating permits, occupational safety requirements, and related environmental criteria. This Standard provides an acceptable means to qualify operators of medical waste incinerators as required by 40CFR60 subparts Ce and Ec.

This Standard does not cover the certification or validation of facility operating procedures, operating practices, facility performance, nor compliance with permit requirements.

1.3 Definitions

air pollution control system: air pollution control devices (APCD) and equipment incorporated into the exhaust gas stream of an incinerator to reduce emissions to the atmosphere of solid or gaseous air pollutants.

burn cycle: as used in para. 2.2.1 of this Standard, a period containing a minimum of one of each of the following medical waste incineration systems components: unit preheat, initiation of waste charging, waste destruction, ash burn down (if applicable), unit shutdown, and ash removal. Unit shutdown does not necessarily require that the incinerator be cooled to ambient temperature. If appropriate, the burn cycle shall also include operation of waste heat recovery systems and air pollution control systems.

facility: the immediate area of the medical waste incinerator system, including all waste storage equipment, handling equipment, treatment equipment, and all structures and improvements that are directly related to the treatment of medical waste.

medical waste [as defined in 40CFR60.51(c)]: generally includes any waste, including solid, semi-solid, or liquid material, generated in the diagnosis, treatment, or immunization of human beings or animals, in research pertaining thereto, or in the production or testing of biologicals. This includes both regulated and non-regulated waste materials. Excluded from this definition is any solid waste regulated as a hazardous waste by the federal government under the Resource Conservation and Recovery Act.

medical waste incinerator: any hospital, medical, or infectious waste incinerator system [as defined in 40CFR60.51(c)] including all equipment related to the medical waste incineration process, such as the feeder to the incinerator, the incinerator itself, the gas cleaning equipment, the residue management equipment, control and monitoring equipment, and any boiler or heat exchanger equipment that utilizes waste heat form the incinerator.

waste heat recovery system: any equipment, such as boilers or heat exchangers, incorporated into an incineration system to transfer heat from the incinerator exhaust gas to another medium for useful purposes.

2 DUTIES AND QUALIFICATIONS

2.1 Duties

This paragraph establishes the duties of the operator for the purpose of identifying facility personnel to whom this Standard applies at HMIWI facilities.

2.1.1 The Operator class designation is as follows:

(a) An operator is certified to operate a medical waste incinerator with a waste heat recovery and air pollution control system.

(b) A medical waste incinerator system may have any combination of waste heat recovery and air pollution control systems.

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(c) The operator is in direct charge and control of the operation of a medical waste incineration system and is responsible for the start up, operation, and shut down of the equipment. Typical responsibilities may include, but are not limited to the following:

(1) operating all mechanical equipment, instrumentation and power controls;

(2) operating in accordance with established practices and procedures;

(3) operating equipment consistent with applicable federal, state, and local government requirements;

(4) identifying and directing action to correct equipment upsets and emergency conditions;

(5) identifying and communicating the need for equipment repairs and maintenance;

(6) operating in a safe manner;

(7) communicating the operational status of the facility when a relieving operator is placed in direct charge and control of the operation;

(8) recording operational data as required;

(9) supervising, training, monitoring, and evaluating other operators; and

(10) assuring non-compliance incidents and corrective action items are reported to management or regulatory agencies.

2.1.2 The Special Class Operator is certified to direct the operation of a medical waste incinerator during start-up, maintenance, upgrade, or inspection. This class of operator does not allow for regular or routine operation of the incinerator. It is intended for field and service personnel, educators, and others who operate only on occasion. The Special Class Operator shall only direct the operation of the medical waste incinerator as follows:

(a) in the presence and under the supervision of a certified operator; and

(b) during the start-up, maintenance, upgrade, or inspection process of the medical waste incinerator.

2.2 Qualifications

2.2.1 Operator. The following are the qualifications that shall be met by an operator of a medical waste incinerator to complete certification under this Standard:

(a) Normal Method

(1) Minimum age of 18

(2) Training — 24 hours

(3) Six months of experience at a HMIWI as operator or supervisor

(4) Passing the ASME written examination

(b) Exception Method

(1) Minimum age of 18

(2) Training — 24 hours

(3) Document hands on operation for a minimum of two burn cycles under the observation of two ASME QMO certified operators

(4) Passing the ASME written examination

2.2.2 Special Class Operator. The following are the qualifications that shall be met by a Special Class Operator of a medical waste incinerator to complete certification under this Standard.

(a) Minimum age of 18

(b) Passing written examination administered by ASME for operator

NOTE: This class is not for normal operation of the HMIWI (see para. 2.1.2).

3 TESTING

3.1 Examinations

The examination shall be structured as a closed book, multiple choice written examination. The examination will include from 150 to 200 questions. Four hr will be provided to complete the examination. To successfully pass the examination, a candidate must correctly answer a minimum of 70% of the test questions.

3.2 Description of Examination

All of the following thirteen subject areas will be represented:

(a) environmental concerns, including pathogen destruction and types of emissions;

(b) basic combustion principles, including products of combustion;

(c) operation of the type of incinerator to be used by the operator, including proper startup, waste charging, and shutdown procedures;

(d) combustion controls and monitoring;

(e) operation of air pollution control equipment and factors affecting performance;

(f) methods to monitor pollutants (continuous emission monitoring systems and monitoring of HMIWI and air pollution control device operating parameters) and equipment calibration procedures;

(g) inspection and maintenance of the HMIWI, air pollution control devices, and continuous emission monitoring systems;

(h) actions to correct malfunctions or conditions that may lead to malfunction;

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(i) bottom and fly ash characteristics and handling procedures;

(j) applicable Federal, State, and local regulations;

(k) work safety procedures;

(l) pre-startup inspections; and

(m) record-keeping requirements.

3.3 Examination Guidelines

Examination guidelines are found in Mandatory Appendix I. The examination questions will be based upon the subject areas included in Appendix I.

3.4 State-Specific Items

Supplementary state-specific test items may be included by states that reference this program. The individual candidates may be requested by their state jurisdiction to provide their test results on such items. ASME certification will not be based upon the state specific test items.

4 CERTIFICATION PROCESS

4.1 Introduction

This section covers the process necessary to certify operators of HMIWI facilities in accordance with this Standard.

4.2 Application Process

4.2.1 Application for Taking Examination. Application forms are available from the ASME. Persons wishing to take the examination shall complete a written application that includes the following:

(a) The class of certification, in accordance with paras. 2.1.1 and 2.1.2 for which the application is being made.

(b) The schedule for examinations shall be established by ASME based upon apparent demand.

4.2.2 Application for Certification. In addition to the items specified in para. 4.2.1, each applicant for certification, shall complete a written application that includes sufficient information to allow for verification of the applicant's experience in accordance with the requirements of para. 2.2. The applicant will be required to attest to the information submitted and to provide the supervisor's name for possible verification.

4.2.3 Application for Certification Under Normal Method. An applicant for operator certification under the normal method shall provide a signed statement from the supervisor who supervised the applicant's six months of experience.

4.2.4 Application for Certification Under the Exception Method. An applicant for operator certification under the exception method shall provide a signed statement from two ASME QMO certified operators verifying the proficiency of the applicant, having witnessed the operator's performance for two burn cycles.

4.2.5 Application for Special Class Operator. The application for Special Class Operator shall indicate the limitations noted in para. 2.2.2 of this Standard.

4.3 Issuance of Certification

Each candidate for Operator and for Special Class Operator certification, who has achieved the qualifications listed in para. 2.2 shall be issued a certificate valid for five years. Each Certificate shall contain the following minimum information:

(a) type of certificate

(b) certified individuals full name

(c) photograph of certified individual

(d) effective date and expiration date

Each certificate shall contain a sequential number to assure traceability and accuracy, and shall be signed by a duly authorized ASME designee. A listing of individuals holding ASME QMO certificates will be made available by ASME.

4.4 Renewal of Certification

Not less than six months prior to the expiration of certification, applications for renewal shall be submitted to ASME. Certification shall be renewed by paying the required fee and conforming to one of the following requirements:

(a) providing a signed statement from the operator's supervisor verifying satisfactory employment for three of the last five years and any annual review or refresher courses required by CFR60.53c(f); or

(b) passing the written examination (see section 3 of this Standard).

Application forms may be obtained from: ASME; Conformity Assessment; Three Park Avenue; New York, NY 10016-5990.

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4.5 Revocation of Certification

Certification may be revoked by ASME for reasons of falsifying or providing inaccurate information in the certification process.

4.6 Due Process

Due process will be provided for requests for reconsideration or appeal of ASME actions. Due Process will be provided in accordance with ASME policies and procedures.

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MANDATORY APPENDIX I
EXAMINATION GUIDELINES

I1 INTRODUCTION

The Operator Certification Examination shall be a single test that includes questions that focus on each of the following thirteen subject areas:

(a) Environmental Concerns

(1) Medical waste types and characteristics

(2) Pathogen destruction

(3) Gaseous emissions from incinerators

(4) Solid residue characteristics

(5) Trace metal emissions of medical waste incinerators

(6) Toxic air emissions including dioxins and furans

(b) Basic Combustion Principles

(1) Combustion process characteristics

(2) Combustion air properties and requirements

(3) Products of combustion

(4) Products of incomplete combustion

(5) Basic principles of thermodynamics and heat transfer

(6) Transient combustion heat release features (e.g., volatile surge from plastic bag combustion)

(7) Formation and control of dioxins and furans

(8) Characteristics of hot water, saturated steam, superheated steam

(c) Incineration Operation

(1) Identification of different types of incinerators and their major components and features

(2) Waste-feeding system features and operations

(3) Auxiliary fuel requirements

(4) Incinerator start-up and operational procedures

(5) Incinerator shut-down procedures

(6) Start-up procedures for Air Pollution Control Devices (APCD)

(7) APCD shut-down procedures

(8) Stack gas bypass systems and stack caps

(9) Operation of ash removal equipment

(10) Impact of incinerator system failure on the operation of the APCDs

(11) Influence of recovery boiler on incinerator operations.

(12) Identification of major components on heat recovery boilers

(13) Heat recovery start-up and shut-down

(d) Combustion Controls and Monitoring

(1) System design considerations

(2) Automatic control system features

(3) Influence of variable waste composition

(4) Waste charging and combustion air controls

(5) Water level controls

(6) Boiler steam temperature, pressure, and flow measurement

(e) Air Pollution Control Devices (APCD)

(1) Basic concepts for removal of acid gases

(2) Basics of of particulate matter

(3) Major constituents in different types of APCD's

(4) Wet scrubbers (packed bed, baffle plate) systems

(5) Spray dry absorber and dry sorbent injections (dry scrubbing) systems

(6) Venturi scrubbers systems

(7) Fabric filter (baghouse) systems

(8) Factors affecting APCD performance and control efficiencies

(9) Control of flue gas temperature entering the APCD

(10) Condensation of flue gas constituents (dew point)

(11) Discharges from different types of APCD's

(12) Procedures for handling and disposal of APCD solid and liquid residues

(13) Control of trace metal and organic emissions using activated carbon

(14) Formation of dioxins and furans in APCDs

(15) Ancillary equipment components such as flue gas temperature control modules, induced draft fans, and sorbent or reagent addition hardware

(16) Impact of APCD system failures on the operation of incinerators

(f) Monitoring Methods

(1) Continuous pollution emissions monitoring systems (CEMS)

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(2) In-situ versus extractive monitoring instruments

(3) Operating principles of different types of emission monitors

(4) Flue gas sample treatment (dryers and dilution) techniques

(5) Calibration procedures

(6) Temperature monitoring devices and methods

(7) Air pollution control device monitors

(8) Incinerator operations monitors

(g) Inspection and Maintenance

(1) Routine inspection and maintenance of Incinerators

(2) Routine inspection and maintenance of air pollution control devices

(3) Routine inspection and maintenance of continuous emissions monitoring systems

(4) Routine inspection and maintenance of ancillary equipment components

(5) Preventive and corrective maintenance

(6) Testing of general stack emissions

(7) Determination of APCD control device efficiency

(8) Testing of hazardous emissions

(9) Soot blowing equipment

(10) Boiler water treatment

(11) Inspection and testing of boiler systems components

(h) Correction of Malfunctions

(1) Identification of typical incinerator system operating problems

(2) Conditions that may lead to malfunctions

(3) Failure modes of major equipment components

(4) Impact of component failure on the operating system

(5) Corrective actions

(6) Key parameters that indicate APCD component failure or the need for corrective action

(7) Heat recovery boiler tube surface fouling and corrective actions

(i) Solid Residue

(1) Bottom ash characteristics

(2) Fly ash characteristics

(3) Methods for evaluating ash quality

(4) Ash removal equipment

(5) Ash handling and disposal procedures

(j) Applicable Regulations

(1) Federal, state, and local environmental regulations

(2) Occupational health and safety requirements

(3) Operating permits and licenses

(4) Air quality permit specifications

(5) Water quality regulations

(6) Reporting of upset conditions and emission exceedances

(7) Annual stack test for pollutant emissions

(8) Ash test methods and disposal requirements

(k) Work Safety Procedures

(1) Industrial hygiene

(2) General safe practices

(3) Emergency actions in the event of fire, explosion, medical, and environmental incidents

(4) Safety considerations for APCD's

(5) Proper handling of reagents and sorbent materials

(6) Packaging requirements

(7) Waste handling requirements

(8) Control of noise, odors, and spillage

(9) Safety practices associated with boiler operation

(l) Pre-Startup Inspections

(1) Incinerators

(1) Air pollution control devices

(1) Boiler systems

(m) Recordkeeping Requirements

(1) Recording of waste received

(2) Recording of waste treatment (charging rates)

(3) Ash (Residue) logs

(4) Maintenance logs

(5) Operational logs and communications

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