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U.S. ENVIRONMENTAL PROTECTION AGENCY

[IL-64-2-5807; FRL-____]

Availability of Model State Training and Certification Programs for High Capacity Fossil Fuel-Fired Plant Operators

AGENCY: Environmental Protection Agency (EPA).

ACTION: Notice of availability of the model State programs for the training and certification of operators of high capacity fossil fuel-fired plants as required under section 129 of the Clean Air Act (Act).

SUMMARY: This action announces the availability of training materials which constitute the model State training program for operators of high capacity fossil fuel-fired plants, and the model State certification program for these operators, as required under section 129 of the Act.

ADDRESSES: The final student handbook (specify "High Capacity Fossil Fuel-Fired Plant Operator Training Program - Student Handbook," EPA-453/B-94-056) may be obtained from the U.S. EPA Air Pollution Training Institute (MD-17), Research Triangle Park, North Carolina 27711, telephone number (919) 541-2497, FAX number (919) 541-5598.

For qualified instructors interested in conducting the training course, single copies of the instructor's guide (specify "High Capacity Fossil Fuel-Fired Plant Operator Training Program - Instructor's Guide," EPA-453/B-94-057)

can be requested by contacting the U.S. EPA Air Pollution Training Institute (MD-17), Research Triangle Park, North Carolina 27711, telephone number (919) 541-2497, FAX number (919) 541-5598 at the above address.

FOR FURTHER INFORMATION CONTACT: For information concerning specific aspects of this notice, contact Mr. James Eddinger, Industrial Studies Branch, Emission Standards Division (MD-13), U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711, telephone number (919) 541-5426.

SUPPLEMENTARY INFORMATION: The following outline is provided to aid in locating information in this notice.

I. Background. Section 129(d) of the Act requires the EPA to develop and promote a model State program for the training and certification of solid waste incineration unit operators and high-capacity fossil fuel-fired plant operators. In August 1993, the EPA submitted to all State air pollution control agencies the model State training programs that the EPA developed for operators of municipal waste combustors (MWC's) and medical waste incinerators

(MWI's) pursuant to this requirement. To ensure the availability of at least one appropriate national certification program for these solid waste incineration units, the EPA requested the American Society of Mechanical Engineers (ASME) to develop and manage a nationwide certification program for MWC and MWI operators. As a result, the ASME developed an ASME certification program for each of these solid waste incineration industry categories.

The model State training programs for MWC's and MWI's were developed by the EPA to provide a level of understanding that is adequate to successfully complete the requirements of the ASME program or an equivalent State-approved program for certification of operators of such facilities. The emission standards (40 CFR 60.50a) promulgated under section 129 for MWC's require certification of the operator by the ASME or an equivalent State-approved certification program.

In October 1992, the EPA initiated development of a training program for operators of high capacity fossil fuel-fired plants. The EPA considers the term high-capacity fossil fuel-fired plants to mean boilers (i.e., devices that combust fossil fuel to produce steam or hot water) greater than 10 million BTU's per hour heat input. The group of high capacity fossil fuel-fired plants (boilers) covered in this training course includes the size range from small

industrial, commercial, and institutional steam generating units (greater than 10 million BTU's per hour heat input) to large utility boilers.

On October 6, 1993 (58 FR 52106), EPA announced the availability of a draft student handbook, prepared as part of a training course for operators of high capacity fossil fuel-fired plants, and EPA's intention to develop a model State certification program for these operators; and invited public comments on both the contents of the student handbook and the EPA's intention to develop the model State certification program.

II. Comments and Responses . Thirty-eight comment letters were received in response to the notice of availability of the draft student handbook and EPA's intention to develop model State training and certification programs: twenty-three from utility companies, seven from industrial boiler facilities, six from trade or technical associations, and two from government agencies. The comments pertained to either specific items or statements in the draft student handbook, the need for the model State training and certification programs, or the coverage of these programs. The comments specific to the draft student handbook have been incorporated into the revised student handbook. The more significant issues raised by commenters relating to the overall model training and certification programs along with

clarification of the EPA's intention for these model State programs are discussed below:

1. Draft student handbook. A general comment on the draft student handbook was that it covers a wide range of facilities (i.e., fuel types, sizes and applications) and that even though the handbook is a relatively comprehensive treatment of basic combustion theory, technology and emission control, the level of understanding of each of these areas required by a plant operator will vary with the size, type and fuel requirements of a facility. The commenters suggested that a modular handbook be developed so training programs could reflect the specific equipment and fuel used at a facility. They further commented that emphasis on the specific areas of training to reflect the organizational structure of the facility should be allowed.

In response, the training course developed by the EPA is modular in design. It is divided into 30 learning sessions. Each session covers a specific area of knowledge, such as, pulverized coal-fired boilers, NO_x control technology, continuous emissions monitoring, etc.. The training course was designed in this manner so that it may fulfill requirements leading to boiler operator certification. The information presented in the training materials covers areas which may be addressed in a potential certification examination. Depending on the different

classes/levels of certification available, the appropriate training sessions for that particular level of certification could be selected from the training materials to address the topics covered in that particular certification examination.

2. Requirement for Operator Training and Certification. Based on the comments received, there appears to be a general misunderstanding that, in the October 6, 1993 Federal Register notice, the EPA was proposing to require the training and certification of operators of high capacity fossil fuel-fired plants. Some commenters stated that the October 6 Federal Register notice failed to clearly state that the draft training program being presented in the form of the draft student handbook was not being required for boiler operators under EPA regulations.

For clarification purposes, section 129 (d) of the Act requires that the EPA develop a model State training and certification program for both operators of solid waste incineration units and high capacity fossil fuel-fired plant operators but mandates training only for operators of solid waste incineration units. This notice announces the availability of the model State programs for the training and certification of operators, as required by section 129 of the Act. This notice is not a rulemaking action to require anyone to implement any training program. The

individual States may make determinations whether or not to require operator training and certification and may also decide whether the EPA's model training program or another training program is appropriate.

3. Need for Training and Certification Programs. Both utility and industrial facility commenters questioned the need for training and certification requirements since their operators already undergo extensive site specific training programs that cover all of the topics listed as chapters in the draft student handbook. The utility industry commented that because of the high skill levels required for safe, efficient and reliable operation, extensive and comprehensive internal training programs have been implemented. Both groups commented that their training programs should be allowed to satisfy the obligation for training and that the EPA should allow any company to conduct a training course/program in lieu of the EPA or equivalent State program, provided it meets the fundamental EPA requirements. Also, the utility industry commented that utility facilities are subject to the Title V Operating Permit program under 40 CFR Part 70 and the Continuous Emission Monitoring rules under 40 CFR Part 75 and therefore the utility industry believes that compliance with these regulations encompasses all the objectives outlined by the EPA for training and certifying operators of high capacity

fossil fuel-fired plants. They recommended that EPA include in its final model State program a provision for allowing compliance with the above regulations to be considered equivalent to meeting the requirements of an operator training and certification program and allowing the substitution of existing utility or industrial boiler training programs for the EPA model training program to avoid unnecessary duplication of effort.

In response and as stated above, under section 129 of the Act, the EPA is mandated only to develop model State training and certification programs for operators of high capacity fossil fuel-fired plants. These model programs will be made available to the States for their use. The EPA agrees that a mechanism should be included in any State rules regarding training and certification to allow facilities to satisfactorily demonstrate the equivalency of their program. With regard to certification, this is similar to the provision included in the EPA regulations for MWC units where EPA allows certification by ASME or an equivalent State-approved certification program.

4. Applicability. Many comments dealt with the coverage of the training and certification programs. These comments included:

a. They questioned the EPA's interpretation of high capacity fossil fuel-fired plants as inclusive of boilers

with relatively small capacity (i.e., as low as 10 million Btu per hour heat input). These commenters suggested that the EPA target training for operators of boilers with 100 million Btu per hour heat input or greater. They commented that many of the boilers in the 10 to 100 million Btu per hour range operate automatically with little attention, without air pollution control equipment and do not incorporate operator adjustment features that could adversely affect air pollution, and are mostly fueled by gas or light oil. Adjustments to these boilers are made on an annual or twice per year basis by qualified outside contractors that specialize in boiler controls and adjustments. The commenters further indicated that the narrow range of adjustments that an operator could make on a gas-fired boiler less than 100 million Btu per hour has a minor influence on emissions and that NO_x emissions are determined primarily by design factors such as configuration of the combustion chamber and the burner design. Neither of these are under control of the operator.

b. A provision should be included in the final model State program to allow for acceptance of alternative training and certification programs for facilities with low capacity factors. The EPA should include an exemption for training for those units with annual capacity factors less than 15%. The required definition of high capacity fossil

fuel-fired plants would not be altered if such an exemption were provided for these units.

c. Many commenters believe that the training and certification requirement was intended to apply only to units subject to Subparts Da, Db, and Dc.

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In response to the above, the range of boiler sizes selected by the EPA for inclusion in the model State training program was based on the range of boiler sizes covered by the various existing EPA emission regulations for steam generating units. These emission regulations cover the size range from 10 million Btu per hour heat input and greater.

Potential air pollution problems can result from poor operation and maintenance of a boiler and associated air pollution control system when operators do not understand the combustion and air pollution control processes and are inadequately trained. The EPA feels that the training of boiler operators, regardless of the size or capacity factor, would result in improved operation, be relatively inexpensive and would reduce emissions.

The reference made to Subparts Da, Db, and Dc in the October 6, 1993 Federal Register notice was intended only to give the reader an indication of the types and sizes of the boilers that were selected for discussion in the training

course. Subparts Da, Db, and Dc list definitions for various aspects covered in the training materials, such as, fossil fuel, electric utility steam generating unit, heat input, fluidized bed combustion, etc.. The reference to Subparts Da, Db, and Dc was not to suggest that the training course was only intended for operators of boilers subject to these subparts. The training course was designed to be appropriate for operators of any boiler with a capacity above 10 million Btu per hour heat input.

III. Model State Training Program . The training program developed for boiler operators is intended to provide the operator with a basic understanding of the principles of fuel combustion and air pollution control and to identify good operating practices. The program is intended to supplement rather than substitute for site-specific "hands-on" training of the operator. The objectives of the training program are: to instruct operators in the basic principles of proper operation and maintenance of boilers and air pollution control systems; to help assure that the boiler is continuously operated in a manner which complies with State and Federal regulations; to enhance the operators appreciation for their role in minimizing air pollution; and to increase the operators awareness of regulatory requirements.

The training materials consist of a student handbook which is not only intended for use during the course but also may be used as a reference by the operators after completion of the course, and an instructor guide which provides the basic materials for use by the instructor of the training course. The instructor's guide includes the course description and agenda, course goals, lesson plans, copies of an initial test and a final course examination, and audio-visual aids.

Activities for developing this training course performed since mailout of the draft student handbook include revision of the student handbook based on comments received from the mailout, development of the instructor's guide, a trial run of the course, revision of the training materials based on comments received from the trial run, and publication of the final student handbook.

The trial run of the training materials was conducted in April 1994. The trial run presented the course materials and obtained comments from participants concerning areas that could be changed to improve the course materials. Among the twenty-eight attendees were operators, training specialists, and supervisors of utility and industrial facilities. Also in attendance were representatives from boiler insurance, inspection, and licensing organizations. Comments received from the trial course were incorporated

into the final student handbook, as appropriate. The chapters which required the most significant revisions were those pertaining to the water and steam circuits, package boilers, and safety. Also, the materials presented in the chapters on combustion principles and air pollution fundamentals were simplified without compromising the material content. The instructor's guide was then modified to reflect changes to the student handbook.

The operator training materials include testing materials that indicate a student's satisfactory completion of the training course. The EPA will provide the final student and instructor manuals to the States so they can use them to implement an operator training program for high capacity fossil fuel-fired plant operators.

IV. Model State Certification Program . In the development of any operator certification program, several key factors must be addressed. Among these factors is which personnel should be required to be certified. The EPA believes certification should not be limited to only the operator with hands-on control of the boiler. These operators may lack the authority to request the assistance of a repairman when equipment needs maintenance or service. Also these operators may not be authorized to take corrective action in the event of equipment malfunction. Such authority may rest with the operator's supervisor. This may be a shift

supervisor, chief engineer, plant manager, etc.. It is the operator's supervisor who is usually responsible for making critical decisions regarding operation and maintenance of the equipment. Because decisions made by the operator's supervisor are key to proper operation of the boiler, the operator's supervisor must have a broader level of understanding than the operator. Thus, there is a need for separate levels of certification for operators and operator supervisors.

In addition, the level of knowledge needed by an operator or operator supervisor is dictated by the complexity of the equipment operated. For example, the knowledge required to operate a coal-fired boiler with an air pollution control system is greater than that required to operate a gas-fired boiler without an air pollution control system. It may not be reasonable to require an operator of a boiler without an air pollution control system to demonstrate knowledge of such equipment. Therefore, several classes of boiler operator certification should probably be developed for each operator certification level.

Furthermore, since, as the commenters have indicated, many boilers may operate with little or no operator attention, any certification program should consider including those individuals who perform the boiler tuning and maintenance.

Another key area concerns the qualifications that an applicant should possess for certification. An acceptable level of skill and operating ability should be demonstrated on a boiler system which is equivalent to (or higher than) the class of boiler for which certification is being sought. This "hands-on" ability could be demonstrated by an on-site examination by a qualified/certified examiner or demonstration of ability before other certified operators who verify the applicant's ability. Also a consideration is the prior experience needed before applying for certification. The certification program should require some prior experience under the direct supervision of a certified operator/operator supervisor who verifies the proficiency of the applicant. Finally, an applicant should be required to successfully pass a written examination covering the areas of knowledge deemed necessary for the particular class/level of certification being sought. The written examination could be administered by the State or some authorized certification organization.

The EPA's intention, announced in the October 6, 1993 Federal Register notice, for developing a model State certification program for high capacity fossil fuel-fired plants is to outline the scope and components that a State agency should include in a certification program.

Components that should be considered for inclusion in any State developed or approved certification program are:

1. Coverage of the certification program.

Determination of the type and size of boilers for which operator certification is appropriate. Boilers for which environmental regulations apply are candidates for inclusion in any certification program.

2. Level of operators to be certified.

The duties and responsibilities of the positions of the operator and operator supervisor should be established for the purpose of identifying facility personnel to whom certification applies at fossil fuel-fired plants. Certification for all persons who have control over the process and can affect process emissions should be included. This may include operators, supervisors, maintenance personnel, and outside contractor personnel.

An operator is generally in direct control of the operation of a boiler system and is responsible for the startup, operation, and shutdown of equipment. Typical responsibilities may include the following:

a. operating equipment in accordance with established practices and procedures;

b. operating equipment consistent with applicable federal, state, and local government requirements;

c. identifying and initiating responses to upsets and emergency conditions;

d. identifying and communicating the need for equipment repairs and maintenance;

e. communicating with management when system operation is in noncompliance with applicable regulations;

f. operating in a safe manner;

g. recording operational data as required.

An operator supervisor generally has direct responsibility for the operation of a boiler system and is responsible for overall on-site supervision, technical direction, management, and performance of the facility. Typical responsibilities may include the following:

a. supervising, training, monitoring, and evaluating operators;

b. assuring operation in accordance with established practices and procedures;

c. assuring equipment is operated in accordance with applicable federal, state, and local government requirements;

d. directing action to correct equipment upsets or emergency conditions;

e. assuring operating and maintenance records are maintained and reports are prepared as required;

f. assuring noncompliance incidents and corrective action items are reported to management or regulatory agencies;

g. assuring a safe workplace.

The operator supervisor may also directly perform the duties and responsibilities of the operator.

3. Classes of certification.

This includes establishment of various classes for which operator certification is appropriate. The level of knowledge needed to properly operate and minimize emissions varies considerably depending on the type of facilities. Therefore, the level of knowledge will vary depending on job duties and responsibilities. Different classes of certification within each level developed under (2) should be considered.

A boiler system may have any combination of fuel type, boiler type and air pollution control system, and an operator should be certified in the class designation equivalent to or more comprehensive than the type of equipment operated.

Example operator class designations are:

Class A - certified to operate a coal-fired boiler with air pollution control systems

Class B - certified to operate a coal-fired boiler without air pollution control systems

Class C - certified to operate a gas or oil-fired boiler with air pollution control systems

Class D - certified to operate a gas or oil-fired boiler without air pollution control systems

4. Qualifications.

The following are the recommended qualifications that should be met by an operator/operator supervisor to complete certification:

a. minimum age requirement;

b. training;

c. minimum level of experience under the direct supervision of a certified operator or operator supervisor who must verify the proficiency of the applicant in all aspects of the job;

d. pass a written examination, as discussed in item 5 below, administrated by the State or a State-approved certification organization.

The acceptable demonstration of skills and ability should be performed on a boiler system equivalent to, or higher than, the class of boiler equipment for which certification is being sought.

During the initial implementation of a certification program when there are not certified operators or operator supervisors available to certify the applicant's proficiency, the applicant's employer could be allowed to

verify that the applicant has been continuously employed as either an operator or operator supervisor for a minimum period of time and that the applicant's job performance has been satisfactory. Further, the employer should verify that the hands-on experience was as an operator or operator supervisor for a boiler system equivalent to, or higher than, the class of boiler equipment for which certification is being sought.

5. Training requirements.

The training requirements should be established for boiler operators to provide the operator with a basic understanding of the principles of fuel combustion and air pollution control and to identify good operating practices. The training requirements should included both classroom and site-specific "hands-on" training of the operator. The objectives of the training program are: to instruct operators in the basic principles of proper operation and maintenance of boilers and air pollution control systems; to help assure that the boiler is continuously operated in a manner which complies with State and Federal regulations; to enhance the operators appreciation for their role in minimizing air pollution; and to increase the operators awareness of regulatory requirements.

6. Pass written examination.

The final key element should be a requirement that the applicant demonstrate sufficient knowledge in specified areas by passing a written examination administered by the State or an approved certification organization. This element should also require a provision for a "bank" of questions to implement the written examination to assure that tests given at different times are not identical.

The examination should be structured as a closed book, multiple choice, and written examination. The examinations for operators should differ from those for operator supervisor consistent with the differences in duties. The examination could be modular in design and given in parts. Candidates successfully passing the appropriate parts can be deemed to have completed the written testing requirements for a particular certification class.

To successfully pass a test part, a candidate should correctly answer a minimum of 70 percent of the questions in that part.

Questions should be related to:

a. Water and Steam Circuit

b. Fuel, Air and Gas Circuit

c. Basic Combustion Principles

d. Air Pollution Fundamentals

e. Boiler equipment characteristics

f. Normal Boiler Operation

g. Automatic Control Systems

h. Instrumentation

i. Preventative Maintenance

j. Safety

k. Air Pollutants of Concern

l. Environmental Regulations

m. Continuous Emissions Monitoring

n. Particulate Control

o. NOx Control

p. SOx Control

q. Water Pollution and Control

r. Solids Waste and Control

7. Issuance of Certification.

Each candidate who passes the written examination and whose proficiency has been verified should be issued a certificate valid for a specific time period (e.g., five years). Each certificate should contain the following minimum information:

a. type of certification;

b. certified individual's full name;

c. photograph of certified individual;

d. effective date and expiration date.

e. signature of a duly authorized designee.

8. Provision for recertification.

Certification should be granted for a limited period of time. The procedure for recertification could be simply verification of satisfactory employment with the appropriate type of equipment for that certification level/classes since the time the previous certification was granted or it could entail additional refresher courses, "hands-on" demonstration, or passing of a written examination.

9. Revocation of Certification.

There should be a procedure included in the certification program to revoke a certification for falsifying or providing inaccurate information in the certification process.

The components listed above as the model State certification program are modelled after the certification standards developed by the ASME for MWC and MWI operators. These ASME certification standards were developed by a committee balanced by interest classification (e.g., regulatory, operators, manufacturers, etc.) and underwent public review and comment. The EPA was a member of the ASME committee for the development of the MWI certification standard.

In August 1992, to ensure the availability of at least one appropriate national certification program, the EPA requested the ASME to develop and manage a nationwide certification program for boiler operators. As a result,

the ASME Board of Safety Codes & Standards and the Council on Codes & Standards approved the formation of a committee in June 1994 to develop such a program. The ASME certification program is anticipated to be completed in late 1996.

As discussed above, the EPA will provide the final student handbook and instructor guide, developed by the EPA, to the States so they may implement operator training or certification programs prior to finalization of the ASME certification program. In addition, some States may already require that boiler operators obtain state boiler operator engineer licenses. If these licensing agencies demonstrate equivalency, a State air pollution control agency could accept this licensing as certification under this program. Licensing organizations, such as the National Institute for the Uniform Licensing of Power Engineers Incorporated, have commented that there are other licensing organizations that may be able to provide certification programs in a shorter timeframe than the ASME since they already have a licensing program developed for boiler operators along with a possible database of appropriate questions. They also indicated a willingness to modify their programs to meet whatever criteria a State sets for a certification program.

As stated in the October 6, 1993 Federal Register , the training materials developed by the EPA will be revised as

necessary when the ASME certification program is sufficiently developed to ensure that the training course is coordinated with the certification requirements.

The ASME has previously developed certification programs for operators of MWC's and MWI's. In terms of the boiler operator certification, the EPA's intention is to continue to work with the ASME by serving on the various development committees and by providing technical assistance to develop a certification program. The ASME certification program is anticipated to be completed no earlier than late 1996.

V. Authority. This notice of availability of model State programs for the training and certification of operators of high capacity fossil fuel-fired plants is issued under the authority of section 129 of the Clean Air Act, as amended.

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Date

Mary D. Nichols
Assistant Administrator
for Air and Radiation

Certified to be a true
copy of the original.