ABC Need-to-Know Criteria for Industrial Waste Operators

ABC

Association of Boards of Certification

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Introduction

As part of the development of its certification exams, the Association of Boards of Certification (ABC) conducted a job analysis of industrial waste operators during 2001 and 2002. The purpose of the job analysis was to identify the essential job tasks performed by industrial waste operators and the capabilities required to competently perform these job tasks. The results of this job analysis provide ABC with the foundation for the development of new physical/chemical and biological industrial waste certification exams.

The *Need-to-Know Criteria* was developed from the results of ABC's industrial waste operator job analysis. The information in this document reflects the essential job tasks performed by operators and their requisite capabilities. This document is intended to be used by certification programs and trainers to help prepare operators for certification.

How the Job Analysis was Conducted

Committee Meeting

A subject matter expert committee was formed to provide technical assistance in the development of the industrial waste operator job analysis. During their meeting, this committee developed a list of the important job tasks performed by both physical/chemical and biological industrial waste operators. The committee verified the technical accuracy, clarity, and comprehensiveness of the job tasks. The committee then identified the capabilities (i.e., knowledge, skills, and abilities) required to perform the identified job tasks. Identification of capabilities was done on a task-by-task basis, so that a link was established between each task statement and requisite capability.

Task Inventory

A task inventory was developed from the data collected during the committee meeting. The inventory included 8-point rating scales for frequency of performance and seriousness of inadequate or incorrect performance. These two rating scales were used because they provide useful information (i.e., how critical each task is and how frequently each task is performed) pertaining to certification.

The task inventory also included a background information section where demographic data such as gender, age, ethnic origin, educational level attained, work experience, and certification level were collected. Space was provided at the end of the inventory for operators to list any important tasks performed on their job which were not included on the inventory, and to make general comments.

The task inventory was sent to 381 industrial waste operators throughout the United States and Canada. 83 out of the 381 inventories mailed were returned for a response rate of 21.8%. Of the respondents, 44.3% worked at physical/chemical treatment plants, 34.4% worked at biological treatment plants, and 21.3% worked at both physical/chemical and biological treatment plants.

Results

The mean, standard deviation, and the percentage of respondents performing each task statement were computed. The mean was used to determine the importance of items and the standard deviation was used to identify items with a wide variation in responses. The percentage of respondents performing each task statement was used to identify tasks and capabilities commonly performed by operators throughout the United States and Canada. The analysis was run separately for physical/chemical and biological treatment operators in order to accurately determine what tasks would be covered on each exam.

A criticality value of 2(mean seriousness rating) + mean frequency rating was calculated for each item on the inventory. This formula gives extra weight to the seriousness rating in determining critical items and was appropriate because it emphasized the purpose of certification — to provide competent operators.

Industrial Waste Certification Exams

The industrial waste certification exams evaluate an operator's knowledge of tasks related to the operation of industrial waste treatment plants. The content of each exam was determined by the subject matter expert committee from the results of the job analysis. To successfully take an ABC exam, an operator must demonstrate knowledge of the core competencies in this document. Because certificates may be used to work in various sized treatment plants, the exams may include technologies that are not used in each treatment plant but are commonly used in many treatment plants.

Four levels of certification exams are offered by ABC, with class I being the lowest level and class IV the highest level. ABC offers both physical/chemical industrial waste and biological industrial waste exams. Each exam consists of 100 multiple-choice questions. The specifications for the exams are based on a weighting of the job analysis results so that they reflect the criticality of tasks performed on the job. The specifications list the percentage of questions on the exam that fall under each job duty. For example, the ABC class I biological industrial waste exam consists of 47 questions relating to the job duty "Biological Treatment Processes" and its associated tasks and capabilities. For a list of tasks and capabilities associated with each job duty, please refer to the list of core competencies on the previous pages. Biological treatment operators are responsible for the core competencies on pages 3 – 8 and 15 – 18. Physical/chemical treatment operators are responsible for the core competencies on pages 9 – 18.

ABC Biological Industrial Waste Exam Specifications

	Class I	Class II	Class III	Class IV
Biological Treatment Processes	47%	48%	45%	50%
Laboratory Analysis	5%	5%	9%	10%
Operate Support Equipment	15%	14%	13%	7%
Evaluate and Maintain Support Equipment	15%	15%	15%	15%
Administrative Duties	8%	8%	8%	8%
Safety and Emergency Preparedness	10%	10%	10%	10%

ABC Physical/Chemical Industrial Waste Exam Specifications

	Class I	Class II	Class III	Class IV
Physical/Chemical Treatment Processes	47%	48%	47%	52%
Laboratory Analysis	5%	5%	7%	8%
Operate Support Equipment	15%	14%	13%	7%
Evaluate and Maintain Support Equipment	15%	15%	15%	15%
Administrative Duties	8%	8%	8%	8%
Safety and Emergency Preparedness	10%	10%	10%	10%

Suggested References

The following are approved as reference sources for the ABC industrial waste examinations. Operators should use the latest edition of these reference sources to prepare for the exam.

California State University, Sacramento (CSUS) Foundation, Office of Water Programs

- *Industrial Waste Treatment,* Volumes I and II
- *Operation of Wastewater Treatment Plants*, Volumes I and II
- *Manage for Success*
- *Advanced Waste Treatment*
- *Treatment of Metal Wastestreams*
- *Pretreatment Facility Inspection*

To order, contact: Office of Water Programs
California State University, Sacramento
6000 J Street
Sacramento, CA 95819-6025

Web site: www.owp.csus.edu
Phone: (916) 278-6142
Fax: (916) 278-5959
E-mail: wateroffice@csus.edu

Water Environment Federation

- *Operation of Municipal Wastewater Treatment Plants,* Manual of Practice No. 11
- *Industrial Wastewater Management, Treatment, and Disposal,* Manual of Practice FD-3

To order, contact: Water Environment Federation
601 Wythe Street
Alexandria, VA 22314-1994

Web site: www.wef.org
Phone: (800) 666-0206
Fax: (703) 684-2492
E-mail: pubs@wef.org

Operators must also be knowledgeable about federal and state/provincial regulations that apply to industrial dischargers. Most of the US federal regulations that apply to industrial dischargers are found in the *Code of Federal Regulations,* Title 40 (www.gpo.gov).