UNITED STATES

ENVIRONMENTAL

PROTECTION AGENCY

INTRODUCTION TO CONTINUOUS MONITORING SYSTEMS

PARTICIPANT GUIDE

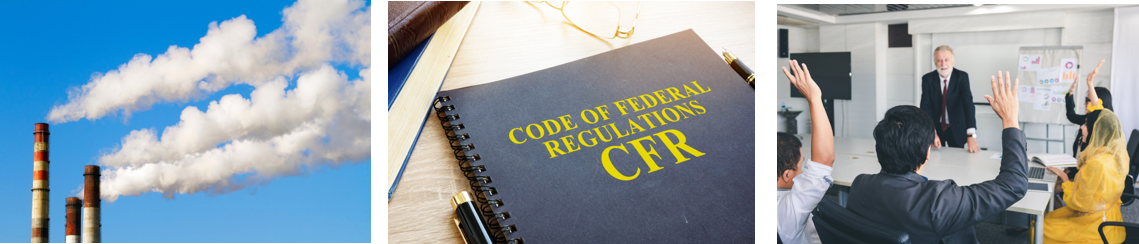


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# Welcome!

## About this Course

The one-day classroom *Introduction to* *Continuous Monitoring Systems (CMS) Course* provides participants with a basic understanding of CMS. It provides an overview of key concepts and information on CMS, including purpose and uses, types, systems design and components, regulations, audits/inspections, and enforcement procedures. This course is an introductory course to CMS. For a more in-depth and comprehensive training course on CMS please refer to APTI 474, CMS.

## Course Organization

There are three modules in this course:

* Module 1: Purpose and Types of CMS
* Module 2: Regulatory Aspects for CMS
* Module 3: Audits/Inspections and Enforcement

## Target Audience

This course is intended for a fairly broad audience and could include participants with non-technical backgrounds (e.g., a basic degree in science) as well as technical backgrounds (e.g., a chemical engineering degree). This course is an introductory course for CMS, therefore, no prior knowledge of CMS is presumed. This course is intended primarily for new hires or any participants who need a basic understanding of CMS in their job responsibilities.

Staff who could benefit from the course include, but are not limited to the following:

* Staff who are inspection and/or enforcement personnel
* Staff who observe stack test and CMS certifications
* Staff who review audit reports
* Staff who work on permits

## Course Goals and Learning Objectives

Upon completing this course, learners will gain a basic understanding of Continuous Monitoring Systems (CMS). They will be able to use the knowledge gained on the following topics to assess the accuracy of CMS data and the ongoing compliance of sources monitored by CMS:

* Types and purposes of CMS
* Review of regulatory basis for CMS
* Overview of enforcement aspects for CMS

At the end of this course, learners will be able to:

* Understand the purpose of CMS and different types and uses of CMS
* Identify the regulations that contain CMS requirements
* Recognize enforcement aspects of CMS

## Prerequisites

There are no prerequisites for this course.

## Evaluation

The following types of evaluation will be conducted:

* Level 1 evaluation (reaction): accomplished through the use of the standard end-of-course evaluation
* Level 2 evaluation (learning): accomplished through the completion of post-training assessment (this could include the Post Self-Assessment, Course Exam, or both)

## Class Size

Typically, class size should be limited to 30 participants or fewer to increase engagement, pace, and interaction among the facilitator(s) and participants.

## Course Agenda

|  |  |  |
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| **Scheduled Time** | **Module** | **Duration** |
|  |  |  |
| 8:30 am – 9:00 am | Introductions | 30 minutes |
| 9:00 am – 10:45 am | Module 1 | 105 minutes |
| 10:45 am – 11:00 am | Break | 15 minutes |
| 11:00 am – 11:30 am | Module 2 | 30 minutes |
| 11:30 am – 12:00 pm | Module 3 | 30 minutes |
| 12 pm – 1:00 pm | Lunch | 60 minutes |
| 1:00 pm – 1:30 pm | Module 3, continued | 30 minutes |
| 1:30 pm – 4:00 pm | Site visit | 150 minutes |
| 4:00 pm – 5:00 pm | Post-Training Assessment (optional) and Exam | 60 minutes |
|  | *Total:* | 510 minutes (8.5 hours) |

## About the Participant Guide

### PowerPoint Slides

This participant guide contains a copy of the PowerPoint presentation slides that the instructor(s) will use to teach this course. This participant guide is yours to keep, so feel free to take class notes on the lines provided below each slide.

### Appendices

There are two appendices in this guide:

* **Appendix A**: **Pre and Post Self-Assessment** – Your instructor may direct you to complete a self-assessment prior to and after the course. These self-assessments will help you to establish a baseline of what you may already know about the information contained in this course. Then, a post self-assessment will allow you to compare how your knowledge and skills have changed as a result of completing the course.
* **Appendix B**: Handouts—Your instructor will provide you with several handouts for this course, which include a Master Glossary, as well as handouts covering General Provisions, Light Properties, Commonly Used Technologies, and General Categories of CMS.

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**MODULE 1: Purpose and Types of CMS**

# Module 1: Purpose and Types of CMS

**Module 1 Description:**

In Module 1, participants will gain a basic understanding of continuous monitoring systems (CMS), including learning about four different types of CMS. They will learn the reasons why CMS are important, as well as their uses.

**Module 1 Learning Objectives:**

* Describe different types and uses of CMS
* Define opacity and describe how continuous opacity monitoring systems (COMS) are used
* Distinguish between extractive and in-situ systems
* Describe how predictive emission monitoring systems (PEMS) function
* Describe how continuous emission rate monitoring systems (CERMS) function
* Describe CEMS location and siting considerations

Estimated Time: 105 minutes (1.75 hours)

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**MODULE 2: CMS in Federal Regulations**

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# Module 2: CMS in Federal Regulations

**Module 2 Description:**

In Module 2, participants will be provided an overview of Federal regulations related to CMS. They will learn about Parts of the Code of Federal Regulations (CFR) that are related to CMS, and will be provided with an overview of Performance Specifications and Quality Assurance (QA).

**Module 2 Learning Objectives:**

* Identify the regulations that contain CMS requirements
* Recognize, in general, what performance specifications are

**Estimated Time:** 30 minutes

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**MODULE 3: Audits/Inspection and Enforcement**

# Module 3: Audits/Inspection and Enforcement

**Module 3 Description:**

In Module 3, participants will be provided an overview of audits and inspections used for CMS. They will learn about the types of audits and what is involved in an inspection. In addition, they will learn enforcement aspects for CMS.

**Module 3 Learning Objectives:**

* Distinguish the difference between performance audits and systems/field audits
* Explain the utility of performance audits and systems/field audits
* Describe the inspector’s role during a Continuous Monitoring Systems (CMS) audit
* Distinguish between CMS as compliance method and CMS data as credible evidence

**Estimated Time:** 60 minutes

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