

Occupational Safety Competency 1.13

Competency 1.13 Occupational safety personnel shall demonstrate a familiarity level knowledge with the use and function of safety related testing and measurement equipment.

1. Supporting Knowledge and Skills

- a. Discuss the use and function of safety related testing equipment such as oxygen meters, explosive atmosphere meters, electrical test equipment, illumination meters, calipers, etc.
- b. Discuss the need for proper equipment maintenance and calibration.
- c. Describe the circumstances that would require the use of each type of equipment.
- d. Describe appropriate actions taken in response to various readings from each type of equipment.
- e. Describe the appropriate application and function of industrial hygiene monitoring and sampling equipment and discuss required safety interfaces.

2. Self-Study Activities (corresponding to the intent of the above competency)

Below are two web sites containing many of the references you may need.

Web Sites		
Organization	Site Location	Notes
Department of Energy	http://wastenot.inel.gov/cted/stdguido.html	DOE Standards, Guides, and Orders
OSHA	http://www.osha-slc.gov/	OSHA documents and search engine
U.S. House of Representatives	http://law.house.gov/cfr.htm	Searchable Code of Federal Regulations

EXERCISE 1.13-A Why is knowledge of proper equipment maintenance and calibration important for occupational safety personnel?

Occupational Safety Competency 1.13

EXERCISE 1.13-B Determine what safety equipment and instrumentation is currently in use on your site or at your facility. Locate the operations manuals and any procedures or policies governing the use of the equipment. Review the materials you have found. Complete the following matrix for the primary equipment under your jurisdiction.

Instrument	Purpose or Function	Calibration Interval or Requirement	Example of an Initiating Circumstance	Notes

Use additional space if you have identified more than six instruments.

EXERCISE 1.13-C Select one instrument from the chart you have completed. Describe the circumstances that would require the use of that piece of equipment.

EXERCISE 1.13-D Using the instrument selected for 1.13-C, describe appropriate actions to be taken for two different readings from the instrument. These should be readings that would indicate some action be taken (i.e., not “normal” readings.)

EXERCISE 1.13-E Describe the appropriate application and function of industrial hygiene monitoring and sampling equipment in use at your site or facility and discuss required safety interfaces.

3. Summary

Proper maintenance and use of safety equipment is critical to meeting DOE’s mission of protecting the public, workers, and the environment. It is imperative that the instruments be operated, and their data interpreted by qualified individuals who are thoroughly familiar with the particular device’s operating principles and limitations, and who have obtained the device’s latest operating instructions and calibration data. Instruments should be calibrated according to the manufacturer’s instructions and designated times and intervals.

Occupational Safety Competency 1.13

4. Exercise Solutions

EXERCISE 1.13-A Why is knowledge of proper equipment maintenance and calibration important for occupational safety personnel?

ANSWER 1.13-A DOE relies upon the accuracy of equipment and instrument readings to provide a safety envelope for the public, workers, and the environment. Without proper maintenance and calibration, the instrument readings are unreliable and that envelope is compromised.

EXERCISE 1.13-B Determine what safety equipment and instrumentation is currently in use on your site or at your facility. Locate the operations manuals and any procedures or policies governing the use of the equipment. Review the materials you have found. Complete the following matrix for the primary equipment under your jurisdiction.

ANSWER 1.13-B Note: The following are provided as examples of typical equipment and requirements. Your answers may vary.

Instrument	Purpose or Function	Calibration Interval or Requirement	Example of an Initiating Circumstance	Notes
Oxygen Meter	Measures the percentage of O ₂ in the air.	Must be calibrated prior to use to compensate for altitude and barometric pressure.	Need to identify oxygen-deficient environment, or flammable or explosive atmosphere.	All critical readings are dependent upon the environment and the process. You should be familiar with the critical readings for all instruments in the situations in which they are used on your site.
Combustible Gas Indicator (CGI)	Measures the concentration of a combustible gas or vapor.	Accuracy depends, in part, on the difference between the calibration and sampling temperatures. Calibrate immediately before use.	Formation of combustible gases (i.e., hydrogen-oxygen) as a result of a process.	
Illumination Meter	Measures three essential quantities: illumination, luminance, and reflectance.	Instruments should be corrected (to account for light reflected from the light-detecting cell surface), calibrated for accuracy and with scale ranges so that measurements are made below one-quarter full scale.	There is some question as to whether a work area is adequately lighted.	

Occupational Safety Competency 1.13

EXERCISE 1.13-C Select one instrument from the chart you have completed. Describe the circumstances that would require the use of that piece of equipment.

ANSWER 1.13-C This is dependent upon the instrument selected. Review the appropriate procedures or operations manuals to verify your answer.

EXERCISE 1.13-D Using the instrument selected for 1.13-C, describe appropriate actions to be taken for two different readings from the instrument. These should be readings that would indicate some action be taken (i.e. not “normal” readings.)

ANSWER 1.13-D This is dependent upon instrument selected. Review the appropriate procedures or operations manuals to verify your answer.

EXERCISE 1.13-E Describe the appropriate application and function of industrial hygiene monitoring and sampling equipment in use at your site or facility and discuss required safety interfaces.

ANSWER 1.13-E This is also dependent upon instruments in use at your facility or site. Review the appropriate procedures or operations manuals to verify your answer.