

JSC Safety and Health Handbook	JPR No.	1700.1K
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Chapter 6.12 Local Chemical Hazard Alarms

This could be you . . .

A chemist was overcome by an oxygen deficiency that occurred in a lab down the hall from where the chemist worked. The lab contained a dewar of liquid nitrogen, which failed and released nitrogen into the room, displacing the oxygen to a dangerous level. An oxygen alarm was sounding, but the chemist did not know what it meant, and entered the room to investigate.

6.12.1 Applicability of this chapter

6.12.1.1 You are required to follow this chapter if you:

- a. Have a hazardous operation in your work area that uses an alarm system to warn of an air quality problem due to airborne contaminants.
- b. Manage or supervise a work area or facility that contains an alarm system that warns of a hazardous airborne chemical.
- c. Enter a facility that has an alarm system to warn of a hazardous airborne chemical.

6.12.2 What this chapter covers

This chapter covers the requirements for using local hazard alarms to control exposures to hazardous materials. It includes information for assessing the need for an alarm, registration of the alarm, alarm care and recordkeeping, and response requirements for facility occupants.

6.12.3 Examples of hazard alarm systems found at JSC, Sonny Carter Training Facility, and Ellington Field

- a. Carbon monoxide alarms in the high bay of building 31.
- b. Oxygen deficiency alarms found in various rooms in buildings 37, 31, 31N, 9, and 13.
- c. Freon 21 alarm found in the high bay of building 7.

Note: You can find a list of alarms at:

<https://sashare.sp.jsc.nasa.gov/sd/SD3/Documents/Chemical%20alarm%20registrations%202016.xlsx>.

6.12.4 Alarms not covered by this chapter

Examples of alarms not covered by this chapter are those that do not alert people of a chemical hazard, such as fire alarms, freezer alarms, security alarms, equipment overheat, water leakage, etc.

6.12.5 How to decide if you need an alarm in your work area

Your supervisor is responsible for doing a hazard analysis for all hazardous chemical use areas. You should refer to your work area's hazard analysis or *job hazard analysis* to determine whether an alarm is required. You should also review Chapter 6.10, "Entering Confined Spaces and

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Controlled Areas,” and Chapter 9.1, “Hazardous Materials Safety and Health.” Whether or not an alarm is needed is based on many factors, including chemical quantities, chemical physical properties, toxicity, facility layout, ventilation, and others. If you have or believe you need a chemical alarm, consult the Occupational Health Branch at x36726 for advice on whether the alarm should be registered with or connected to the Emergency Operations Center. The decision is usually based on the results of a hazard analysis .

6.12.6 If you need an alarm in a work area

6.12.6.1 When an alarm is needed for chemical exposure control, you shall:

- a. Register the alarm with the Occupational Health Branch for inclusion in the JSC inventory. Submit JSC form 1879, “JSC Chemical Hazard Alarm Registration,” along with a copy of the hazard analyses to the Occupational Health Branch (building 229, SD3229, x36726). The form requires specific information, including alarm owner, alarm type, chemicals of interest, location, calibration, maintenance, and recordkeeping. The Occupational Health Branch will assign an individualized registration number to the alarm and place it into the alarm-monitoring program. All chemical alarms, fixed in place and portable, shall be registered. You can find a link to JSC Form 1879 in Appendix D.
- b. Use the same form (JSC Form 1879) to decommission the alarm when an alarm is no longer needed.
- c. Connect the alarm to the Emergency Operations Center for proper monitoring and response, if necessary.
- d. Develop written procedures for alarm use, calibration, and maintenance. Maintain documentation to show compliance with these requirements (dates, times, calibration results, maintenance issues). You shall keep the documentation or a copy *with the alarm* for the Occupational Health Branch safety and management inspection purposes.
- e. Include the appropriate alarm response by all occupants to all alarms found in the facility in the facility Emergency Action Plan. You shall brief *or train facility occupants* on this plan.
- f. Maintain a list of names and methods of contact (phone number, pager number) of work area responsible parties and keep it *readily available for support during off-hour alarm activations*.

6.12.7 Alarm testing

Before testing any alarm, you shall first notify the Emergency Operations Center.

6.12.8 Responsibilities

- a. As a **work area supervisor**, you are responsible for:
 - (1) Doing hazard analyses for all potentially hazardous jobs or activities in your area of responsibility. Use procedures in Chapter 9.1 of this Handbook. Occupational health consultation is available by calling x36726
 - (2) Registering the alarm with the Occupational Health Branch
 - (3) Making sure that calibrations and maintenance are done in the specified frequency and

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keeping records at the alarm site to verify that the alarm is reliable and working properly

- (4) Writing an emergency response plan specific to the alarm, training affected workers in the plan, and making the plan available to the Facility Manager
 - (5) Providing help to JSC emergency responders during an alarm event
 - (6) Ensuring remediation activities (ventilation, point source safing, etc.) by requesting support from the appropriate organizations
- b. As a **Facility Manager**, you are responsible for:
- (1) Maintaining an inventory of all alarm systems in the facility
 - (2) Maintaining a means of contacting responsible, knowledgeable support personnel for technical advice during an alarm event
 - (3) Periodically inspecting the alarm and records to verify that the alarm is properly maintained, calibrated, and working for its intended purpose
 - (4) Verifying that the alarm is properly registered by the Occupational Health Branch
 - (5) Making sure that the facility's Emergency Action Plan includes the chemical alarm systems and response requirements
 - (6) Making sure all facility occupants and visitors are informed, briefed, or trained in alarm response requirements
- c. The **Occupational Health Branch** is responsible for:
- (1) Maintaining an inventory of all chemical alarm systems
 - (2) Assigning alarm registration numbers
 - (3) Providing help to JSC emergency responders during an alarm event
 - (4) Inspecting all registered alarms annually
- d. The **Emergency Operations Center** is responsible for calling the Facility Manager and supporting personnel callback.
- e. The **Security Office** is responsible for enforcing perimeters around emergency scenes.
- f. JSC **fire protection specialists** are responsible for providing initial response to calls received from the Emergency Operations Center from hazard detection alarms. Other aspects of the Emergency Action Plan, based on the initial response, may include:
- (1) Initiating the plan
 - (2) Evacuating remaining nonessential personnel
 - (3) Defining an area perimeter in an emergency
 - (4) Performing industrial hygiene program air testing
 - (5) Developing specific controls for protecting response personnel

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- g. The **JSC Safety and Test Operations Division** is responsible for:
- (1) Providing support to the Emergency Operations Center in connecting alarms
 - (2) Performing the duties required by JPR 1040.4, “JSC Emergency Preparedness Plan”