

Section 1.09 Fire Prevention and Protection

1. Scope

This section establishes fire prevention and protection requirements for all Bureau of Reclamation- owned, controlled, or occupied facilities, construction sites, and mobile equipment. This section incorporates all the requirements of the Department of the Interior Departmental Manual, Series 27, Safety Management, Part 485, Safety and Occupational Health Program, Chapter 19, Fire Safety. Where this section does not provide specific instructions, it adopts, by reference, the current editions of Occupational Safety and Health Administration (OSHA) regulations, National Fire Protection Association (NFPA) codes and standards, and International Code Council (ICC) codes.

2. General Requirements

a. Planning

Reclamation facilities shall establish fire prevention, fire emergency action, and fire response plans to provide a safe work environment for our employees, contractors, and the public. These plans must also effectively protect the government's assets, Reclamation's operations, and the environment from the hazards created by fire, explosion, and events involving hazardous materials.

b. Minimum Criteria for Life Safety

Reclamation uses NFPA 101, Life Safety Code, and ICC International Fire Code (IFC) as the minimum criteria for life safety features in Reclamation-owned, controlled, or occupied facilities.

c. Maintenance

Any device, equipment, system, condition, arrangement, level of protection, fire-resistive construction, fire exposure control (e.g., grounds, outdoor storage, vegetation), or any other feature required for fire prevention and protection of Reclamation facilities shall be continuously maintained in an effective and working condition.

d. Testing and Inspections

Any device, equipment, system, condition, arrangement, level of protection, fire-resistive construction, or any other feature required for fire prevention and protection of Reclamation facilities shall be tested, inspected, and operated as specified in this section.

3. Responsibilities

a. Area Office Managers

- Shall establish a fire prevention plan, emergency action plan, and fire response plan for each facility.

4. Training Requirements

a. Initial

- All Employees. Where required, employees shall be trained in the general principles of portable fire extinguisher use and the hazards associated with incipient-stage firefighting.
- Designated Employees. Employees designated to use portable fire extinguishers shall be trained in the general principles of portable fire extinguisher use, the hazards associated with incipient-stage firefighting, and the hands-on use of portable fire extinguishers.
- Fire Brigade. All fire brigade members shall receive training meeting the requirements of NFPA 600, Standard on Facility Fire Brigades, and OSHA 29 CFR 1910 Subpart L, Fire Protection.

b. Refresher/Recertification

- Portable Fire Extinguishers. All employees and designated employees shall receive annual portable fire extinguisher training.
- Fire Brigade. All fire brigade members shall receive refresher training meeting the schedule and requirements of NFPA 600 and OSHA 29 CFR 1910 Subpart L.
- Recordkeeping. All Reclamation training records shall be kept in the Department of the Interior official repository.

5. Pre-Job Briefing and Planning Requirements

a. Fire Prevention Plan

Each facility shall have a written fire prevention plan and it must be readily available for employees to review. The fire prevention plan must include:

- a list of all major workplace and mobile equipment fire hazards,
- an evaluation of the wildland fire exposure,
- the type of fire prevention and protection equipment necessary to control each major fire hazard,
- a list of potential ignition sources and procedures for controlling these sources,
- procedures for controlling accumulations of flammable and combustible waste materials and proper handling and storage of hazardous materials,
- procedures for regular maintenance of safeguards installed on heat-producing equipment to prevent the accidental ignition of combustible materials,
- if applicable, procedures for fire and security rounds by security or assigned personnel,
- assignments of responsibilities for maintaining the fire prevention and protection equipment that prevents or controls sources of ignition or fires and controlling fuel source hazards,

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- procedures for regularly scheduled fire prevention and protection inspections, and
- procedures for informing new and existing employees assigned to the facility of the fire hazards to which they are exposed, and review parts of the fire prevention plan necessary for self-protection.

b. Fire Emergency Action Plan

Each facility shall have a written fire emergency action plan and it must be readily available for employees to review. The fire emergency action plan must include:

- an explanation of the alarm system used to notify employees of emergencies,
- assignment for points of contact who can provide employees more information about the plan or explain duties under the plan,
- procedures for reporting a fire or other fire-related emergency, emergency evacuation (e.g., type of evacuation and exit route assignments), accounting for all employees after evacuation, and employees performing rescue or medical duties,
- guidelines for training employees who will assist in a safe and orderly evacuation of other employees during a fire emergency, and
- procedures and a risk assessment for employees who remain behind to operate critical facility operations before evacuating.
 - Exercise. The fire emergency action plan must be exercised annually, at a minimum, by completing an evacuation drill.

c. Fire Response Plan

Each facility shall have a written fire response plan, and it must be readily available for employees to review. The fire response plan must include:

- the overall fire response plan for mobile equipment and strategy for the facility,
- a list of expected fire scenarios and the planned response to each,
- assignment of responsibilities for employee use of portable fire extinguishers,
- if applicable, the organizational statement for the facility fire brigade,
- if applicable, written local fire department coordination, and
- planned post-fire actions for returning the facility to normal operations.

d. Employee Review

The first-line supervisor must review the fire prevention plan, fire emergency action plan, and fire response plan with new employees upon assignment to the facility and with specific employees when their responsibilities under any of the plans change. Each of the plans must be reviewed with all employees whenever the plans are developed or changed, or at least every three years.

e. Contractors

When the contract requires the submittal of a safety plan, the contractor is responsible for developing a fire prevention plan, fire emergency action plan, and fire response plan that all meet the requirements in paragraphs 1.09.5.a, Fire Prevention Plan, 1.09.5.b, Fire Emergency Action Plan, and 1.09.5.c, Fire Response Plan, of this Reclamation Safety and Health Standard (RSHS). The plans must be submitted to the contracting officer as part of the contractor's safety plan per RSHS Section 1.03, Contractor Requirements. The contractor shall maintain all fire plans at the job site throughout all phases of the contractor's work. The contractor must review each of the plans with all contractor employees upon assigning them work at the job site.

6. Personal Protective Equipment (PPE) and Other Safety Equipment

a. Fire Brigades

Fire brigades shall be provided protective and firefighting equipment that meets the requirements of NFPA 600, NFPA 1977, Standard on Protective Clothing and Equipment for Wildland Fire Fighting, and OSHA 29 CFR 1910 Subpart L.

7. Safe Practices

a. Fire Suppression Systems

- Buildings and Equipment. Facility supervisors shall ensure competent employees install fire suppression systems in Reclamation facilities and on Reclamation equipment when required by building or fire codes.
- Mobile Equipment. Fire suppression systems shall be installed in Reclamation-owned and controlled and General Services Administration (GSA)-owned mobile equipment, including watercraft, when required by applicable fire codes or when deemed necessary by the fire prevention plan.
- Design, Installation, and Modification. All new fire suppression systems, and any modifications to existing fire suppression systems, shall be designed and installed to meet the requirements of applicable NFPA codes and standards, the IFC, and OSHA 29 CFR 1910 Subpart L.
- Carbon Dioxide Personnel System Safety
 - Hazards to Personnel. Fixed carbon dioxide fire protection systems shall not be installed in occupied spaces due to carbon dioxide's oxygen displacement and poisonous characteristics that cause asphyxiation and physiological effects.
 - Protected Space Entry. Entry into any space protected by a fixed carbon dioxide fire protection system shall only be allowed after the carbon dioxide system is blocked from operation by lockout/tagout (clearance) procedures.
 - Warning Signs. Carbon dioxide protected area warning signs shall be affixed in conspicuous locations in every protected space, at every entrance to protected spaces, in spaces near protected spaces where it is determined that carbon dioxide

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could migrate creating a hazard to personnel. Warning signs shall also be affixed at each entrance to carbon dioxide storage rooms, and where carbon dioxide can migrate or collect in the event of a discharge from a storage container safety device.

- Inspection, Maintenance, and Testing
 - Water-Based Systems. All water-based fire suppression systems shall be inspected, tested, and maintained to meet the requirements of NFPA 25, Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems, and OSHA 29 CFR 1910 Subpart L. These systems include sprinkler, deluge, and water mist systems; standpipes; water mains; and fire pumps.
 - Carbon Dioxide Systems. All carbon dioxide extinguishing systems shall be inspected, tested, and maintained to meet the requirements of NFPA 12, Standard on Carbon Dioxide Extinguishing Systems, and OSHA 29 CFR 1910 Subpart L.
 - Clean Agent Systems. All clean agent fire extinguishing systems shall be inspected, tested, and maintained to meet the requirements of NFPA 2001, Standard on Clean Agent Fire Extinguishing Systems, and OSHA 29 CFR 1910 Subpart L.
 - Halon 1301 Systems. All Halon 1301 fire extinguishing systems shall be inspected, tested, and maintained to meet the requirements of NFPA 12A, Standard on Halon 1301 Fire Extinguishing Systems, and OSHA 29 CFR 1910 Subpart L.
- Records. As-built system installation drawings, hydraulic calculations, original acceptance test records, device manufacturer's data sheets, and manufacturer's operating instructions shall be retained for the life of the system and shall conform with Reclamation Manual Directive and Standard, Information Management (RCD 05-01).

b. Fire Alarms and Notification Systems

- Buildings and Equipment. Fire alarm and notification systems shall be installed in Reclamation facilities and on Reclamation equipment when required by building or fire codes or when deemed necessary by the fire prevention plan.
- Mobile Equipment. Fire alarm and notification systems shall be installed in Reclamation-owned and controlled and GSA-owned mobile equipment, including watercraft, when required by applicable fire codes or when deemed necessary by the fire prevention plan.
- Installation and Maintenance. All fire alarms and notification systems shall be designed, installed, inspected, maintained, and tested to meet the requirements of NFPA 72, National Fire Alarm and Signaling Code, the IFC, and OSHA 29 CFR 1910 Subpart L.
- Records. As-built system installation drawings, electrical calculations, original acceptance test records, device manufacturer's data sheets, and manufacturer's operating instructions shall be retained for the life of the system and shall conform with RCD 05-01.

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c. Fire Extinguishers

- Buildings. Portable fire extinguishers shall be provided throughout all Reclamation facilities.
- Vehicles and Mobile Equipment. Portable fire extinguishers, at a minimum 5- pound 3-A:40-B:C rated, shall be provided in any Reclamation-owned and controlled or GSA-owned vehicle and mobile equipment used as a transportation van/bus, service vehicle, special purpose vehicle, material hauling vehicle, boom truck, lift trucks (forklifts), construction equipment, watercraft, etc.
- Selection, Installation, and Maintenance. The selection, installation, inspection, maintenance, recharging, and testing of portable fire extinguishers shall meet the requirements of NFPA 1, Fire Code; NFPA 10, Standard for Portable Fire Extinguishers; and OSHA 29 CFR 1910 Subpart L.

d. Fire Fighting Response

- Strategy. All Reclamation facilities shall have an overall fire response strategy as part of their fire response plan.
- Incipient-Stage Fire. All Reclamation facilities shall determine whether employees should use portable fire extinguishers to attempt to extinguish an incipient-stage fire or immediately evacuate the facility. This determination shall be based on the fire prevention plan and specified in the fire response plan.
- Portable Fire Extinguishers. All employees designated by the fire response plan, occupant emergency plan, or other safety requirement (i.e., job hazard analysis) to use portable fire extinguishers shall receive portable fire extinguisher training that meets the requirements in OSHA 29 CFR 1910 Subpart L.
- Fire Brigade
 - General. When deemed appropriate and necessary by the fire prevention plan, Reclamation facilities shall establish a fire brigade that meets the requirements of NFPA 600, NFPA 1977, and OSHA 29 CFR 1910 Subpart L
 - Classification. Fire brigades shall be classified into one or more of the following types:
 - incipient-stage firefighting,
 - advanced exterior firefighting,
 - interior structural firefighting, or
 - both advanced exterior and interior structural firefighting
 - Organizational Statement. If applicable, the Reclamation facility shall prepare and maintain a statement which establishes the existence of a fire brigade; the basic organizational structure; the type, amount, and frequency of training provided to fire brigade members; the expected number of members in the fire brigade; and the

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functions the fire brigade is to perform at the workplace. This statement shall be part of the fire response plan.

- Fire Department Coordination. Reclamation facilities shall coordinate with the local fire department to outline the assistance fire responders will provide during a fire emergency, conduct pre-event planning, ensure equipment compatibility, and facilitate fire department familiarization with, and training at, the Reclamation facility.

e. Out of Service Fire Protection

- Employee Notification. Employees shall be notified when a fire protection feature is out of service.
- Risk Management. Measures shall be taken to ensure that increased risks during the out of service conditions are minimized and the duration of the out of service condition is limited.
- Tracking. All out of service fire protection features shall be tracked, by work orders until returned to functional condition.
- Return to Functional Condition. All out of service fire protection features shall be returned to functional condition and tested to verify functionality.
- Out of Service Over 24 Hours. The regional authority having jurisdiction and regional safety manager shall be notified of any fire protection feature that is, or is expected to be, out of service longer than 24 hours.

f. Building Evacuation

- Exit Signs. Exits from all buildings, shops, and other facilities where employees work, or are open to the public, shall be marked and illuminated per the requirements of NFPA 101. When an exit sign does not lead immediately out of the building, only exit signs leading in the direction of egress shall be visible. Any subsequent exit signs shall be visible.
 - Design. Exit signs shall have the word "EXIT" in plainly legible letters not less than 6 inches high, with the principal strokes of the letters in the word "EXIT" no less than 3/4-inch wide.
 - Illumination. Exit signs shall be illuminated to a surface value of at least 5 foot-candles (54 lux) by a reliable light source and be distinctive in color. Self-luminous or electroluminescent signs that have a minimum luminance surface value of at least .06 footlamberts (0.21 cd/m²) are permitted.
- Evacuation Diagram. When deemed appropriate and necessary by the fire emergency action plan, Reclamation facilities shall post evacuation diagrams reflecting the actual floor arrangements and exit locations on each floor. Per NFPA 101, the evacuation diagrams are required in facilities classified as assembly occupancies.
- Exit Doors and Paths. Exit doors shall not be locked in the direction of egress when the building is occupied, or the door shall be opened from the inside by a single motion

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system that will unlock and open the door without keys, tools, or special knowledge. Exit paths shall always be clear of obstructions.

- Means of Egress. The means of egress for all buildings shall meet the requirements of NFPA 101.
- Delayed Evacuation.
 - Delayed Evacuation Plan. Facilities with critical operations that must be shut down in an orderly manner during an emergency event evacuation shall have a written delayed evacuation plan. The delayed evacuation plan shall designate personnel to complete critical operations.
 - Risk Assessment. The supervisor completes and documents the risk assessment for the delayed evacuation. The risk assessment shall consider NFPA 101, paragraphs 40.2.5.2.2, A.4.8.2.1(3), and A.40.2.5.2.2 (2018 edition). The written risk assessment shall be maintained and reviewed with employees designated for delayed evacuation as part of the fire emergency action plan. All identified risks shall be mitigated to the greatest extent possible.

g. Hot Work Operations

- Hot Works Operations Plan. All Reclamation facilities shall have a written hot work operations plan. NFPA 51B, Standard for Fire Prevention During Welding, Cutting, and Other Hot Work, shall be used as a guideline for the hot work operations plan and hot work permit system. The hot work operations plan shall address the following hot work operations/equipment:
 - welding and cutting processes,
 - open flames,
 - heat treating,
 - grinding,
 - thawing pipe,
 - powder-driven fasteners,
 - hot riveting,
 - torch-applied roofing, and
 - similar applications producing or using spark, flame, or heat.
- Designated Areas. Hot work operations shall be conducted in designated areas that meet the requirements of NFPA 51B and are kept fire safe (e.g., noncombustible or fire-resistant construction, free of combustible and flammable contents, and suitably segregated from adjacent areas by a 35-foot combustible-free space or a barrier constructed of noncombustible materials).
- Hot Work Permit System. A hot work permit system shall be used for all hot work operations conducted outside of designated areas referenced in paragraph 1.09.7.g.

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h. Smoking

- Facilities and Outdoors. Smoking shall not be allowed inside or within 25 feet of any entrance, air intake, outdoor storage, or fuel-dispensing areas.
- Vehicles and Mobile Equipment. Smoking shall not be allowed in any Reclamation-owned or GSA-owned vehicles and mobile equipment, including watercraft.
- Signage. “No Smoking or Open Flames” signs shall be posted in all areas where smoking is prohibited.
- Designated Areas. Designated smoking areas shall be established at Reclamation facilities and shall be located at least 25 feet from any entrance or air intake.
- Disposal. Cigarettes and other smoking waste shall be discarded only into containers designed and listed by a Nationally Recognized Testing Laboratory (NRTL) for disposal of smoking materials.

i. Internal Combustion Engines

- Spark Arrester. Any internal combustion engine used in proximity to grass, brush, timber, or similar cellulose materials shall be equipped with a spark arrester that meets the performance and maintenance requirements of Department of Agriculture, U.S. Forest Service Standard 5100-1d, Standard for Spark Arresters for Internal Combustion Engines.
- Wildland Fire Hazard. Any vehicles or equipment with internal combustion engines used in proximity to grass, brush, timber, or similar cellulose materials shall be evaluated as a potential wildland fire ignition hazard. The evaluation shall include potential ignition sources (e.g., hot surfaces, sparks).
- Flammable Vapors Hazard. Any vehicles or equipment with internal combustion engines used in proximity to flammable vapors or gases shall be evaluated as a potential ignition hazard. The evaluation shall include potential ignition sources (e.g., engine overspeed, hot surfaces, sparks).

j. Open Flame Devices

Open fire and flame devices, such as incinerators, torches, and controlled fires, shall not be left unattended.

k. Cleaning and Degreasing

Gasoline or liquids with a flashpoint below 100 degrees Fahrenheit shall not be used for cleaning and degreasing; only nonflammable liquids or liquids with a flashpoint above 100 degrees Fahrenheit shall be used.

l. Explosive Gases and Vapors

Open flames or heating elements shall not be used where flammable gases or vapors may be present.

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m. Housekeeping

- General Requirements. All Reclamation facilities and job sites shall be kept clean and orderly by removing all unnecessary combustible and noncombustible materials, waste, and debris at the end of each work shift or day.
- Collection of Waste Materials.
 - Containers. Employees shall use NRTL-labeled, self-closing metal containers to collect waste saturated with flammable or combustible liquids. Employees shall only use noncombustible or NRTL-labeled, nonmetallic containers to collect waste and rubbish.
 - Separation of Combustible Items. Employees shall keep combustible items separate from other types of combustible items and from noncombustible items.
 - Container Labels. All containers, except in office settings, used to collect waste shall be affixed with a label indicating the intended contents (e.g., trash, oily rags, scrap metal).
- Vehicles and Mobile Equipment.
 - General Requirements. Employees shall keep all Reclamation- owned and controlled or GSA-owned vehicles and mobile equipment, including watercraft, clean and orderly by removing all unnecessary combustible and noncombustible materials, waste, and debris at the end of each work shift or day.
 - Cleaning. Employees shall keep engine compartments, mechanical and hydraulic operation components, and storage and utility areas of vehicles and mobile equipment clean, as needed, to prevent the buildup of combustible debris and oily deposits.
- Inspections. All employees shall conduct daily housekeeping checks. Employees do not need or maintain to record daily checks in the Department's official repository.

n. Ground Maintenance

- General Requirements. Employees shall maintain grounds at all Reclamation facilities and job sites by keeping areas clean and the surrounding vegetation controlled.
- Cleaning. Custodial employees shall collect and remove waste around facilities and job sites on a regular schedule, or as needed, to prevent accumulation.
- Outdoor Waste Disposal. Waste materials placed outdoors or in dumpsters for disposal shall be located at least 20 feet from structures.
- Vegetation. On a regular schedule, or as needed, qualified employees shall control the growth of tall grass, brush, and weeds surrounding facilities and job sites using mechanical and chemical means to reduce fire risk.
- Fire Break. A minimum 3-foot clear fire break shall be maintained at all facilities and job sites.

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o. Separation of Buildings and Structures

Non-fire-resistive buildings or structures shall be at least 25 feet apart. Reclamation considers a group of non-fire-resistive buildings with a total ground floor area of no more than 2,000 square feet as one building for this purpose, provided that each building in the group is at least 10 feet away on each side from other buildings.

p. Heating Devices

- General Requirements. Temporary portable heating devices shall meet the requirements of NFPA 1, paragraph 11.5, Heating Appliances, and OSHA 29 CFR 1926 Subpart F, Fire Protection and Prevention.
- Approval. The use of temporary portable heating devices must be approved via a permit issued by regional or area management for Reclamation-owned facilities and job sites or by the GSA building manager for GSA-owned facilities.
- Permit Request. The following information shall be submitted when requesting a temporary portable heating device permit:
 - proposed placement, including distance from combustibles,
 - service, maintenance, and surveillance schedules,
 - proposed fuel storage and refueling system, and
 - method for prompt detection of gaseous contamination or oxygen deficiency
- Data Plates. The temporary portable heating device shall have a permanently affixed data plate that provides the following information:
 - required clearances,
 - ventilation requirements,
 - fuel type and input pressure,
 - lighting and extinguishing instructions, and
 - electrical power supply characteristics
- Wood Floors. Heaters that are not suitable for use on wood floors shall be affixed with labels instructing users not to place them on wood or other combustible floors. When using such heaters, place them on noncombustible material equivalent to at least 1-inch-thick concrete and extends at least 2 feet beyond the heater in all directions.
- Combustible Covering. Employees must not use heaters near combustible tarpaulins, canvas fabric, or similar coverings. Employees must place heaters at least 10 feet away from combustible coverings and must securely fasten or tie down the coverings.
- Stability. Employees must place heaters on level surfaces to prevent tipping.
- Installation. Qualified employees must install, vent, operate, and maintain heaters in accordance with the manufacturer's instructions.
- Spark Arresters. Qualified employees must install spark arresters on smokestacks that could otherwise permit sparks to escape.

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- Carbon Monoxide Monitors. Facilities using portable heating devices powered by combustible fuel must have functional carbon monoxide monitors installed. The carbon monoxide monitors must be inspected and tested following manufacturer's instructions.
- Grounding. Qualified employees must ground the non-current-carrying metal parts of cord- and plug- connected heaters.
- Office Spaces. Only electric portable space heaters equipped with tip-over safety switches, overheat protection, and thermostatic controls shall be permitted for use in office spaces.
- Electric Space Heaters.
 - NRTL Listing. All electric space heaters shall be listed by a NRTL.
 - Clearance. A minimum 3 feet of clearance from combustible materials shall be maintained around all electric space heaters.
- Liquid-Fueled Heaters. Liquid-fueled heaters shall meet the requirements of NFPA 31, Standard for the Installation of Oil-Burning Equipment.
- Natural Gas Heaters. Natural gas heaters shall meet the requirements of NFPA 1 and NFPA 54, National Fuel Gas Code.
- Liquefied Petroleum Gas Heaters. Liquefied petroleum gas heaters shall meet the requirements of NFPA 1 and NFPA 58, Liquefied Petroleum Gas Code.
- Restricted Use.
 - Open Flame-Type Heaters. Facilities and employees shall not use open flame-type heating devices with exposed fuel below the flame.
 - Lubrication or Service Areas. Heaters in lubrication or service areas, where employees do not dispense or transfer flammable liquids, must be approved and installed at least 18 inches above the floor to protect the heater from damage. Heaters in areas where employees dispense flammable liquids shall be approved for garage use and installed at least 8 feet above the floor.

▲ RSHS Appendix A: Definitions

RSHS Appendix A ([Definitions](https://www.usbr.gov/safety/rshs/index.html)) is available to print at:
<https://www.usbr.gov/safety/rshs/index.html>.

▲ RSHS Appendix B: Additional References and Citations

RSHS Appendix B ([Additional References and Citations](https://www.usbr.gov/safety/rshs/index.html)) is available to print at:
<https://www.usbr.gov/safety/rshs/index.html>.