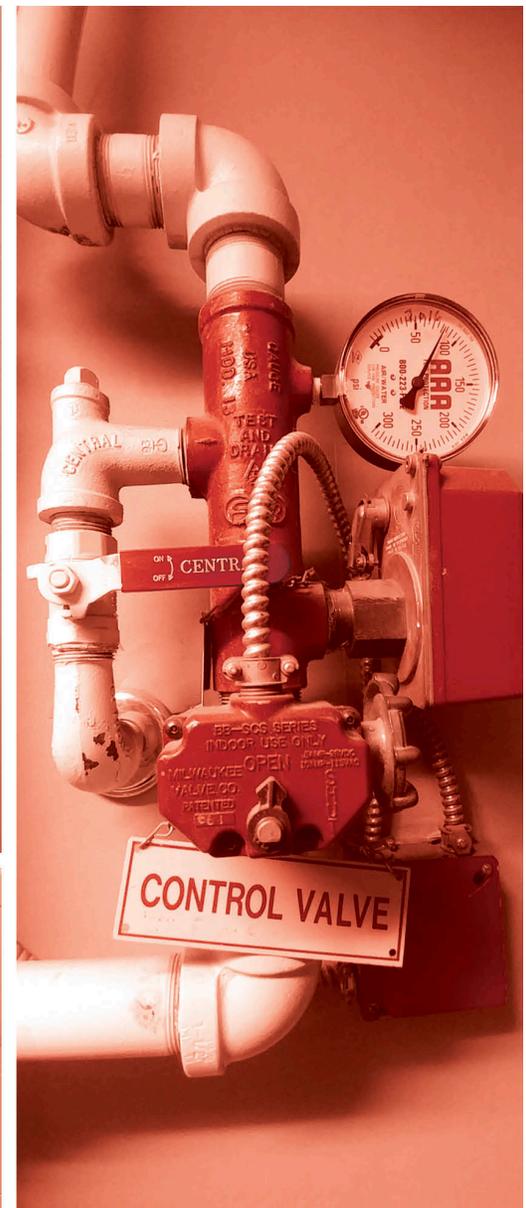


Creating a Fire Prevention and Management Plan

INSTITUTE OF SCRAP RECYCLING INDUSTRIES • REV. NOVEMBER 18, 2019



This document provides guidance to U.S. and Canadian scrap processing operations in creating a fire prevention and management plan (Plan).

This is a living document, and ISRI plans to review and update it at least every year. Because each scrap processing facility is different and faces unique hazards, each Plan must be site- and business-specific. The authors encourage each site to review its operations based on the guidance this document provides. Each site is also encouraged to consult with a consultant that has experience with fire risks at a scrapyard. This guide is scalable; each Plan should be prepared according to the type and size of the facility. Some suggestions for larger facilities will not be appropriate for smaller facilities.

This is a guidance document on how to prepare a Plan. It IS NOT designed to provide a template for such a plan. The authors suggest that this entire document—and not just sections of this document—be considered as guidance in preparing a Plan.

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Please refer to <https://www.isri.org/fire-management-resources> for the most recent revision or updates of the guide.

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**A fire prevention and management plan should consist of
three elements:**

**FIRE PREVENTION,
INCIPIENT FIREFIGHTING,
AND
CRISIS MANAGEMENT.**

1. FIRE PREVENTION

U.S. Occupational Safety and Health Administration regulations require many facilities to have a fire prevention plan that is a written document the company reviews and keeps current. Even if OSHA does not require it for your facility, there are benefits to having a fire prevention plan that meets OSHA's minimum requirements. OSHA requirements of a fire prevention plan in 29 CFR are as follows:

1910.39(a)

Application. An employer must have a fire prevention plan when an OSHA standard in this part requires one. The requirements in this section apply to each such fire prevention plan.

1910.39(b)

Written and oral fire prevention plans. A fire prevention plan must be in writing, be kept in the workplace, and be made available to employees for review. However, an employer with 10 or fewer employees may communicate the plan orally to employees.

1910.39(c)

Minimum elements of a fire prevention plan. A fire prevention plan must include:

1910.39(c)(1)

A list of all major fire hazards, proper handling and storage procedures for hazardous materials, potential ignition sources and their control, and the type of fire protection equipment necessary to control each major hazard;

1910.39(c)(2)

Procedures to control accumulations of flammable and combustible waste materials;

1910.39(c)(3)

Procedures for regular maintenance of safeguards installed on heat-producing equipment to prevent the accidental ignition of combustible materials;

1910.39(c)(4)

The name or job title of employees responsible for maintaining equipment to prevent or control sources of ignition or fires; and

1910.39(c)(5)

The name or job title of employees responsible for the control of fuel source hazards.

1910.39(d)

Employee information. An employer must inform employees upon initial assignment to a job of the fire hazards to which they are exposed. An employer must also review with each employee those parts of the fire prevention plan necessary for self-protection.

For the most up-to-date U.S. requirements, visit the OSHA website:

https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_id=12887&p_table=STANDARDS

For the Canadian requirements, visit the National Fire Code of Canada website:

<https://nrc.canada.ca/en/certifications-evaluations-standards/codes-canada/codes-canada-publications/national-fire-code-canada-2015>

A fire prevention and management plan (Plan) should focus on the fire triangle: Fire requires the presence of a fuel source, an ignition source, and a substance that supports combustion—usually oxygen. To prevent fires, the plan should control or eliminate one or more of the three elements of the fire triangle.

Because a Plan is site-specific, each Plan must address the specific fire hazards and firefighting equipment associated with that site. Have the Plan specify the name or job title of the parties responsible for performing each task. Almost any Plan should include a consideration of the following elements:

Interior Review

- A fire and housekeeping inspection checklist** that covers all areas where flammable material is stored and used. This should include warehouses, offices, shops, mobile equipment, lightning arresters, and material piles (height and separation).
- Combustible dust hazard** abatement plans if applicable.
- Posted emergency evacuation plans** and an outside meeting place designated with signage. Review the evacuation plan annually.
- Escape routes** that are maintained and clearly marked in large areas.
- Emergency lights and signs** that are working and have adequate battery supply, if applicable.

Fire Suppression

- Maintenance definitions, maintenance procedures, and a testing schedule for fire detection and suppression equipment**, including fire extinguishers, sprinklers, fire hose stations, fixed point monitor guns, on-site fire hydrants, fire pumps, and fire alarm systems. Most require annual or more frequent testing. Most companies use outside professional services for maintenance, inspection, and testing; however, never give complete control to contractors. A designated employee on site should make a final check to ensure that critical valves, electrical systems, and all components are left in the ready position at the conclusion of the service.

Portable Fire Extinguishers

- Extinguisher types** specific to the materials you handle per NFPA 10. (See Appendix 1 for list.)
- A map identifying their location** for inspection purposes.
- Employee training** in fire extinguisher use in accordance with 29 CFR 1910.157.

See Appendix 1 for NFPA standards on inspection and testing of fire detection and suppression equipment. Use a qualified professional service for fire equipment installation or modification.

Vehicles and Mobile Equipment

- Inspection criteria and frequency of inspection and testing for mobile equipment.** For fire prevention, focus the inspection on the condition of the hydraulic hoses as well as other fire causes, such as sparks and spark prevention.
- If appropriate, adequately sized, properly rated fire extinguishers** properly mounted and in compliance in each vehicle or piece of mobile equipment.

Emergency Preparedness

- Fire drills.** Base the nature and frequency of the drills on the nature and frequency of equipment changes, operational changes, and changes in personnel. When there is a change in operation, equipment, or personnel, consider whether there are changes in fire risks, make appropriate changes to the Plan, and determine whether a new drill is needed. Consider holding drills annually or more frequently as needed. It is also suggested that the facility involve the local fire department at least once a year.

Electrical Systems

- Testing requirements and frequency for electrical systems.** Try to test electrical systems with thermography equipment, if available, to identify loose connections, hot spots, and overloaded circuits.
- Inspection criteria and inspection frequency for portable electrical equipment,** including extension cords. One hazard an inspection might identify, for example, is the use of extension cords for the long term where the facility needs to install permanent electrical outlets.
- Portable propane heaters.** Replace such heaters with a permanent heating system where practical.

Exterior Review

- Locked doors.** Do buildings with locked doors or fire doors have emergency exits?
- Inbound inspection procedures.** Create an inbound source-control procedure to identify—and, if possible, eliminate—possible ignition sources, flammable materials, and hidden fire hazards from inbound loads of material such as children’s toys, vehicles, or household items with batteries; propane tanks; and fuel tanks. Periodically review the procedures for inspecting inbound material and verify compliance with procedures.
- Material pile inspection.**
 - Are equipment operators and inspectors trained in identifying and eliminating possible ignition sources, flammable materials, and hidden fire hazards from inbound loads of material such as children’s toys, vehicles, or household items with batteries; propane tanks; and fuel tanks?
 - Are material piles an adequate distance apart to create an adequate fire break and have driving aisles to ensure access for firefighting equipment?
 - Are material piles at an adequate distance to create an adequate fire break from buildings, processing equipment, and/or other critical assets?

- Has the facility outlined the methods it will use to control pile size, such as auxiliary storage and controlling the flow of material in times of equipment shutdown or unusual market conditions that lead to higher-than-normal volumes?
- Are material piles of an acceptable height to allow firefighting access?
- Are possible ignition sources and flammable materials kept separate from material piles?
- Are proper fire extinguishers and other fire suppression material appropriately close to each material pile?
- Consider checking with local zoning codes on requirements for pile height and access.
- Emergency signage.** For fire and emergency equipment and emergency exits, is required signage in place, clean, and maintained?
- Windssocks.** If the facility has windssocks, are they in good condition? Windssocks can be useful for evacuation plans and first responders.
- Facility signage.** Is there signage to identify the facility and all gates, doors, and building entrances?
- Smoking areas.** Smoke-free workplaces are safest. If you allow smoking, are there designated smoking areas located an adequate distance from all combustibles and structures in accordance with state and local laws and regulations? Consider providing a self-extinguishing ashtray and instruct employees to use it.

Plan Review

- Review the plan as needed to address any changes in the facility and operations.

Facility Review

- Review and update the fire prevention plan after any significant change in operations, building use, and/or expansion.
- Local fire codes may specify the maximum quantity of material that may be stored indoors without the addition of a sprinkler system. Consult your local fire department, fire inspector, or insurance company for information.
- Different buildings, facilities, and materials are likely to require different strategies.
- Consider the layout and fire suppression system for the entire facility and for each part of the facility, including fire water supply via hydrants, water trucks, water totes, pumps, hoses, etc. Depending on the facility layout, for facilities that have a shredder, consider have a separate section in the fire prevention plan for the shredder.

Safe Work Practices for Fire Prevention

- Hot work.** Implement a hot work permit program if appropriate. Consult NFPA 51B (<https://www.nfpa.org/codes-and-standards/all-codes-and-standards/list-of-codes-and-standards/detail?code=51B>).
- Contractor control.** Implement and follow contractor control procedures to ensure contractors are aware of site hazards.
- Fire extinguisher tags.** Implement the use of tags on fire extinguishers and fill out a tag every time you use that extinguisher.
- Fire department input.** Consider conducting a fire prevention planning tour with your local fire department. They can help identify areas where large amounts are flammables are stored, such as propane and diesel fuel.

Employee Training

- New employees.** Consider including fire prevention and fire response activities in all new employee orientation sessions.
- Fire response equipment.** Provide training on all types of fire response equipment that may be available at the facility, such as standpipe systems, wheeled units, water totes, etc. Training should include use and limitations for specific equipment. Retrain after changes in the operations and personnel that impact fire risks.
- Fire drills.** Hold fire and evacuation drills jointly with the fire department on a regular basis. Practice turning incident command over to the fire incident commander. Have new drills after changes in the operations and personnel that impact fire risks.
- Incident command structure.** Have at least one employee at a facility trained on Incident Command Structure 100-level and higher if appropriate for the facility and operations.
- Fire response.** Provide fire extinguisher and incipient stage fire response training regularly to the appropriate staff. For members of the emergency response team, conduct live practice with an extinguisher once a year, with the fire department when possible.
- Hazard recognition and inspection.** Conduct hazard recognition and fire inspection training regularly.
- Hot work.** Conduct regular training on hot work programs.

Emergency Response Plan

- Develop an emergency response plan using the Federal Emergency Management Agency's National Incident Management System. (Find the FEMA Fact Sheet on NIMS Implementation at https://www.fema.gov/pdf/emergency/nims/ngo_fs.pdf.) Your engagement may be as simple as understanding the system and your role during an emergency response at your facility and training your staff in NIMS. You may seek further training or choose to participate in community exercises.

Outreach and Relationship-Building With First Responders

- Build relationships with first responders and other relevant local groups BEFORE a crisis. These groups may include the fire department, emergency medical service, emergency chemical response services, police, hazardous response teams, environmental agencies, and other local officials. **While the following steps are essential, they are secondary to the creation of a site-specific fire prevention plan.**
- Familiarize your local EMS and fire department with your site layout and building layout and design. Have site maps showing the location of equipment and buildings, safety data sheets (SDSs), and fire suppression systems. Share these plans with the fire department during their site visit. Discuss hazards and common incidents in the industry. Get their assistance in testing the 911 response system to ensure a 911 call from your facility will provide the right address for emergency services to respond.
- Keep an emergency contact list for key personnel and update it as needed.
- Consult with the local fire department about using a secure key system such as a Knox Box. Ensure other locked doors can be opened from the outside. Place the site maps and emergency contact list in the box as well as keys for opening critical gates and buildings. A few keys are OK, but it's better for all critical locks to use the same master key.
- Participate in National Fire Prevention Month (October) with your fire department.
- Volunteer to serve on a local emergency planning board or similar group.
- Sponsor a local community-service project.
- Host an open house on a weekend day for the community or for first responders and their families.
- Collaborate with first responders to provide space, materials, and the opportunity to practice emergency-response techniques such as confined space rescue, high-angle rescue, and vehicle extrication.
- Identify emergency response equipment needs and donate needed equipment to local responders.
- Invite first responders to company safety celebrations.

BUILD THE RELATIONS NOW—BEFORE YOU NEED THEM!!

2. INCIPIENT FIREFIGHTING

OSHA requires every workplace to have an emergency action plan. Its minimum requirements under 29 CFR 1910.38 Emergency Action Plans are as follows:

- An emergency action plan must be in writing, kept in the workplace, and available to employees for review.
- Per 29 CFR 1910 an emergency action plan must include, at a minimum:
 - Procedures for emergency evacuation, including type of evacuation, exit route assignments, and meeting place;
 - Procedures to be followed by employees who remain to operate critical plant operations before they evacuate;
 - Procedures to account for all employees after evacuation;
 - Procedures to be followed by employees performing rescue or medical duties; and
 - The name or job title of every employee who may be contacted by employees who need more information about the plan or an explanation of their duties under the plan.

The emergency action plan may differ for indoor vs. outdoor operations. In addition, consider the following:

- Training employees to extinguish incipient fires as discussed below.
- Sharing the site emergency response plan with the local fire department.
- Training all employees to use the National Fire Protection Association's RACE acronym to respond to all fires:

Remove all victims.

Alert responders. (Call 911)

Confine the fire by closing doors if possible.

Extinguish the fire if possible during the incipient stage.

**Call 911 at the first indication of fire—
DON'T WAIT UNTIL THE FIRE IS OUT OF CONTROL!!
Call first, and cancel if the fire is extinguished.**

DEFINITIONS OF AN INCIPIENT FIRE:

OSHA

Incipient-stage fire means a fire which is in the initial or beginning stage and which can be controlled or extinguished by portable fire extinguishers, Class II standpipe or small hose systems without the need for protective clothing or breathing apparatus (29 CFR 1910.155(c)(26))

NFPA

- **Incipient Fire Fighting:** Firefighting performed inside or outside of an enclosed structure or building when the fire has not progressed beyond incipient stage. (NFPA 600, 1081)
- **Incipient-Stage Fire:** A fire that is in the initial or beginning stage and that can be controlled or extinguished by portable extinguishers or small amounts of dry extinguishing agents, without the need for protective clothing or breathing apparatus. (NFPA 484)

Incipient-Stage Fire Actions

Consider the following when dealing with and training for an outside incipient-stage fire:

- Techniques for incipient firefighting in addition to fire extinguishers and fire hoses, such as fire suppression generators (also called fire grenades or water bombs), large water totes for dumping water, and remote fixed monitoring and extinguishing systems.
- Training heavy equipment operators on how to keep a fire in a material pile small and isolated by segregating the burning material when the fire is in the incipient stage. However, this activity should stop when the fire moves beyond the incipient stage.
- Always approaching fires from the upwind side.
- Knowing when to drop the hose and run, such as if the fire continues to grow or if the heat and smoke require the use of personal protective equipment. **LIFE** is your first priority—all else is secondary!!

Incipient Fire Responders

Any firefighting beyond the incipient stage requires a fire brigade as outlined in NFPA 600, which requires an organizational statement, specialized training, and equipment and maintenance.

OTHER KEY POINTS IN THE INCIPIENT STAGE AND BEYOND:

- Have a well-rehearsed emergency response plan and follow it! Be sure individual members know their roles.
- Have pull stations for alerting the fire department about a fire, but always make a back-up call to 911.
- When calling the fire department (911), give the best, most accurate location address, including gate information if you have more than one entrance. Remain on the line until you are told to hang up.
- Have a predesignated individual meet the fire or emergency response team at the gate and direct them to the fire zone. At larger facilities, have additional staff guide the response team to the fire.
- Turn over command to the fire incident commander when they arrive and assume a supporting role.
- If you believe it's appropriate for those in the surrounding area to shelter in place or evacuate, make that suggestion to the incident commander.
- Close the facility or area of the fire and have non-emergency managers establish plant gate control.
- If asked to assist the fire department, such as by moving material, do so with extreme caution. Work safely, as you would on any other day. Emergency response does not eliminate the need to use all safety protocols.
- Assign someone to shut off electricity and gas to affected areas, or show fire department personnel where they can do so.

3. CRISIS MANAGEMENT

It is a good idea to have a crisis management plan.

In drafting and carrying out the crisis management plan, consider the following:

Emergency Plans

- Having an emergency action plan that is regularly reviewed and regularly updated, preferably annually or any time there is a change to the facility.
- Writing the emergency action plan so that the facility evacuates to the upwind side of any fire.

Environmental

- Considering in advance the potential environmental impact of an incident, such as firewater runoff or the emissions related to a smoke plume, and what actions you might need to take in response. Consider contracting in advance with an emergency response service.
- Having a plan to manage firewater runoff in the event of a major fire. Know if the runoff will be to an on-site retention basin or off site. Check to see if the facility stormwater plan allows for firewater runoff. Create a plan for how to deal with any runoff.
- Monitoring air quality downwind of the fire to determine whether emergency responders should recommend sheltering in place or evacuating areas downwind of a fire.

Employee Wellness

- Having a plan and designating employees (typically in HR) to communicate with families of workers via e-mail, automated phone messages, or other means, particularly if injuries are involved.
- Having a plan and designating employees (typically in HR) to reach out and offer family assistance and/or condolences in the event of serious injury.

Business Interruption

- Preparing a plan to quickly communicate with your major customers about how the incident will affect their delivery or receipt of material and when you expect service to return to normal.

Insurance Notification

- Communicating with your insurance company as soon as practical. Check with the company insurance policy or insurance agent on reporting obligations.
- Assigning someone to take photos and video of the scene and statements from employees who were involved. Have a designated camera ready in the event of an incident.

- Preserving the scene and not starting remediation until cleared to do so by the fire department and regulators, unless conditions immediately dangerous to life exist. Depending on the extent of the fire, consider consulting with an environmental consultant on cleaning up firewater and waste created by the fire.

Agency Notifications

- If necessary, notifying OSHA or local environmental agencies per requirements.

Media and Community Relations Best Practices

Pre-Incident Media Preparedness

- Having press statements and press releases, including those for social media, prepared in advance and approved for immediate release.
- Having a designated media contact trained and available. It is important to speak to the media, but it is equally important that this be done by someone who has the appropriate training.
- Having a defined location for media to congregate and wait until the designated media contact is available. Have positive reading material available at this location. Assign a person to maintain this location.
- Being truthful, and not speculating about the root cause of the incident.
- Communicating in advance to employees that they are not authorized to give out any information about an incident to anyone, including the mass media or social media.
- If you have a relationship with a specific reporter, calling him or her first with your press release.
- The media's job is to get a story. Consider giving timely briefings, and consider offering a tour of the affected area once it is safe to do so.
- Having a contract with a legal or public relations firm.

Neighbor and Community Notification

- Having a spokesperson reach out to community leaders if possible. That person should have the appropriate contact information at their desk, at home, and programmed in their cellphone. Community leaders might include the mayor/county executive, conservation officer, department of environmental protection, National Response Center, emergency remediation, and spill cleanup companies.
- Communicating with neighbors as soon as possible.
- Knowing and participating in community websites, listservs, Facebook groups, etc.
- Setting up a messaging system and collecting contact information from those who would like to receive calls, texts, or e-mails sharing information if there is an incident.

Social Media

- Assigning a person to monitor social media (Twitter, Facebook, etc.) to correct any erroneous or fake news. One potential tool is Data Miner, a location-based Twitter tracking service.
- Posting positive social media messages thanking the emergency services for their quick and professional response to the incident.

Fire Prevention in Trucks and Other Mobile Equipment

Consider the following in dealing with trucks and other mobile equipment as part of fire prevention:

- Creating a specific fire prevention plan for trucks and mobile equipment that addresses likely fire scenarios.
- Including drivers and operators in all fire-safety training.
- Having a specific pre-and post-trip inspection checklist for fire that includes fire extinguisher accessibility.
- Including mobile equipment fire equipment in monthly fire equipment inspections and maintenance.
- Training drivers and mobile equipment operators to inspect material during loading for potential fire hazards.
- Promptly repairing oil and fuel leaks.
- Maintaining good housekeeping and maintenance to prevent oil and fuel build up or leaks.
- Limiting the time material that could spontaneously combust remains in trucks.
- Planning and training for response to likely fire scenarios in vehicles and mobile equipment.
- Specifying the elements and frequency of detailed tire, wheel, and brake inspections.
- At night, if possible, parking trucks in area large enough that they are separated by sufficient space that, in the event of a fire in the equipment, prevents the fire from spreading to other vehicles or property. Where space is tight, consider interspersing vehicle types to reduce the risk of fire taking out the entire fleet.
- Developing a policy and training employees on how and when to dump a load on fire in a safe location. Local regulations may vary—check with local authorities.
- Identifying vendors in advance who can clean up dumped load fires to minimize cleanup time and property damage.

This document does not cover serious accidents and/or fire on the road or at customer locations. A specific crisis management plan for trucks and on-the-road activity is recommended.

APPENDIX 1

Fire Extinguisher Types

Different types of fire extinguishers are designed to fight different types of fire. The three most common types of fire extinguishers are air-pressurized water, CO₂ (carbon dioxide), and dry chemical. The following table provides information from OSHA and other sources regarding the type of fire and which fire extinguisher should be used.

Extinguisher Type	Fire Type
Water	Ordinary combustibles: Fires in paper, cloth, wood, rubber, and many plastics require a water-type extinguisher labeled A .
CO₂ (carbon dioxide)	Flammable liquids: Fires in oils, gasoline, some paints, lacquers, grease, solvents, and other flammable liquids require an extinguisher labeled B .
Dry Chemical	Electrical equipment: Fires in wiring, fuse boxes, energized electrical equipment, computers, and other electrical sources require an extinguisher labeled C .
Multi-Purpose	Ordinary combustibles, flammable liquids, or electrical equipment: Multi-purpose dry chemical is suitable for use on classes A, B, and C .
Class D, type 1	Metals: Fires involving powders, flakes, or shavings of combustible metals require special extinguishers labeled D. Class D, type 1 extinguishers use sodium chloride as the extinguishing agent, which is effective for controlling magnesium, sodium, potassium, sodium-potassium alloys, uranium, and powdered aluminum metal fires.
Class D, type 2	Metals: Fires involving powders, flakes, or shavings of combustible metals require special extinguishers labeled D. Class D, type 2 extinguishers use a copper-based dry powder as the extinguishing agent, which is effective on titanium and lithium fires.
Class K	Kitchen fires: Fires involving combustible cooking fluids such as oils and fats.

Note: ISRI's electronics recyclers recommend using sand or a water-based (class A) fire extinguisher on lithium battery fires or lithium-ion battery fires.

Inspection of Fire Extinguishers

NFPA 10 Standard for Portable Fire Extinguishers (2019)—Chapter 7.2—requires manual inspection of fire extinguishers in intervals not less than 31 days. You must check (at least) the following:

1. Location in designated area
2. Visibility or means of indicating extinguisher location
3. Access to extinguisher
4. Pressure gauge in operable range
5. Fullness by weighing or hefting
6. Condition of tires, wheels, carriage hose, and nozzle (if applicable)

Additional resources:

NFPA 12 Standard on Carbon Dioxide Extinguishing Systems

NFPA 12A Standard on Halon 1301 Fire Extinguishing Systems

NFPA Standards Related to Installation, Inspection, Testing and Maintenance of Water-Based Fire Protection Systems:

[NFPA 13](#) Standard for the Installation of Sprinkler Systems

[NFPA 14](#) Standard for the Installation of Standpipe and Hose Systems

[NFPA 15](#) Standard for Water Spray Fixed Systems for Fire Protection

[NFPA 20](#) Standard for the Installation of Stationary Pumps for Fire Protection

[NFPA 22](#) Standard for Water Tanks for Private Fire Protection

[NFPA 24](#) Standard for the Installation of Private Fire Service Mains and Their Appurtenances

[NFPA 25](#) Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems

[NFPA 750](#) Standard on Water Mist Fire Protection Systems

[NFPA 1961](#) Standard on Fire Hose

[NFPA 1962](#) Standard for the Care, Use, Inspection, Service Testing, and Replacement of Fire Hose, Couplings, Nozzles, and Fire Hose Appliances

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