Automatic Sprinkler Systems -- OSHA Standard 1910.159

Carol J. Lehtola, Charles M. Brown and William J. Becker

The Impact of Safety on Florida Agriculture

Florida agriculture, including forestry and seafood, made an annual economic impact of $53 billion in 1998. More than 81,000 people work on the 40,000 farms in the state, and more than 50,000 are employed in other activities related to agriculture. The state's agricultural enterprises range from large citrus, vegetable and cattle operations to small family-operated farms.

From 1989 to 1998, there were approximately 240 deaths related to agriculture in Florida, according to data compiled by the Deep South Center for Agricultural Health and Safety. In addition, agriculture has one of the highest injury and death rates among U.S. industries.

Safety in Florida agriculture is challenging because:

- the state's agricultural enterprises are diverse,
- safety knowledge among workers varies,
- manual labor is used extensively,
- the climate creates year-round heat stress.

Therefore, it is vital to assist the public in learning about OSHA documents related to agriculture. More related information is available at the following Web sites:

Florida AgSafe: <http://agen.ufl.edu/~clehtola/agsaferef.htm>
OSHA Regulations: <http://www.osha.gov/comp-links.html>

Overview

This document, a condensation of Section 1910.159 of the Occupational Safety and Health Act (29 CFR), is not intended to be totally inclusive but rather to highlight the information and requirements in the complete OSHA standard that owners and
managers of agricultural businesses should understand. Refer to the OSHA Web site given above for the complete standard and for court interpretations of the standard.

Contents of OSHA Standard 1910.159

• Section 1910.159(a) -- Scope and Application
• Section 1910.159(b) -- Exemptions
• Section 1910.159(c) -- General Requirements

NOTE: Some sections of OSHA standards are labeled "Reserved." This label implies either that information has been deleted from the previous version of the standard or that additions to the standard are anticipated. Because standards often reference other standards, it is important that paragraph numbers remain consistent.

Section 1910.159(a) -- Scope and Application

1910.159(a)(1) -- The requirements of this section apply to all automatic sprinkler systems installed to meet a particular OSHA standard.

1910.159(a)(2) -- For automatic sprinkler systems used to meet OSHA requirements and installed prior to the effective date of this standard (January 1, 1981), compliance with the National Fire Protection Association (NFPA) or the National Board of Fire Underwriters (NBFU) standard in effect at the time of the system’s installation will be acceptable as compliance with this section.

Section 1910.159(b) -- Exemptions

Automatic sprinkler systems installed in workplaces, but not required by OSHA, are exempt from the requirements of this section.

Section 1910.159(c) -- General Requirements

1910.159(c)(1) -- Design

(i) -- All automatic sprinkler designs used to comply with this standard shall provide the necessary discharge patterns, densities, and water flow characteristics for complete coverage in a particular workplace or zoned subdivision of the workplace.

(ii) -- The employer shall assure that only approved equipment and devices are used in the design and installation of automatic sprinkler systems used to comply with this standard.

1910.159(c)(2) -- Maintenance. The employer shall properly maintain an automatic sprinkler system installed to comply with this section. The employer shall assure that a main drain flow test is performed on each system annually. The inspector’s test valve shall be opened at least every two years to assure that the sprinkler system operates properly.

1910.159(c)(3) -- Acceptance Tests. The employer shall conduct proper acceptance tests on sprinkler systems installed for employee protection after January 1, 1981, and record the dates of such tests. Proper acceptance tests include the following:

(i) -- Flushing of underground connections;
(ii) -- Hydrostatic tests of piping in system;
(iii) -- Air tests in dry-pipe systems;
(iv) -- Dry-pipe valve operation; and
(v) -- Test of drainage facilities.

1910.159(c)(4) -- Water Supplies. The employer shall assure that every automatic sprinkler system is provided with at least one automatic water supply capable of providing design water flow for at least 30 minutes. An auxiliary water supply or equivalent protection shall be provided when the automatic water supply is out of service, except for systems of 20 or fewer sprinklers.

1910.159(c)(5) -- Hose Connections for Fire Fighting Use. The employer may attach hose connections for fire fighting use to wet pipe sprinkler systems provided that the water supply satisfies the combined design demand for sprinklers and standpipes.

1910.159(c)(6) -- Protection of Piping. The employer shall assure that automatic sprinkler system
piping is protected against freezing and exterior surface corrosion.

1910.159(c)(7) -- Drainage. The employer shall assure that all dry sprinkler pipes and fittings are installed so that the system may be totally drained.

1910.159(c)(8) -- Sprinklers

(i) -- The employer shall assure that only approved sprinklers are used on systems.

(ii) -- The employer may not use older style sprinklers to replace standard sprinklers without a complete engineering review of the altered part of the system.

(iii) -- The employer shall assure that sprinklers are protected from mechanical damage.

1910.159(c)(9) -- Sprinkler Alarms. On all sprinkler systems having more than twenty (20) sprinklers, the employer shall assure that a local waterflow alarm is provided which sounds an audible signal on the premises upon water flow through the system equal to the flow from a single sprinkler.

1910.159(c)(10) -- Sprinkler Spacing. The employer shall assure that sprinklers are spaced to provide a maximum protection area per sprinkler, a minimum of interference to the discharge pattern by building or structural members or building contents and suitable sensitivity to possible fire hazards. The minimum vertical clearance between sprinklers and material below shall be 18 inches (45.7 cm).

1910.159(c)(11) -- Hydraulically Designed Systems. The employer shall assure that hydraulically designed automatic sprinkler systems or portions thereof are identified and that the location, number of sprinklers in the hydraulically designed section, and the basis of the design is indicated. Central records may be used in lieu of signs at sprinkler valves provided the records are available for inspection and copying by the Assistant Secretary of Labor for Occupational Safety and Health or a designated representative.