**Chapter 31 Forest Products and Biomass Feedstocks**

31.1\* General

The storage, manufacturing, and processing of timber, lumber, plywood, veneers, biomass feedstock, and by-products shall be in accordance with this chapter and NFPA 664.

31.2 Permits

Permits, where required, shall comply with Section 1.12.

31.3 Protection of Storage of Forest Products

31.3.1 Application

31.3.1.1

The requirements of this chapter shall apply to the outside storage of the following:

Lumber and wood panel products at retail and wholesale lumber storage yards

Lumber and wood panel products at other than retail and wholesale storage yards

Ties, poles, piles, posts, and other similar forest products at pressure-treating plant yards

Outside storage of wood chips, hogged material, and wood by-products

Logs

Outside storage of biomass feedstocks

31.3.1.2

The requirements of this chapter shall not apply to forest products stored on piers and wharves as addressed in NFPA 307.

31.3.2 General Fire Protection

The requirements in this subsection shall apply to all facilities regulated by 31.3.3 through 31.3.8 except as modified by those subsections.

31.3.2.1 Operational Fire Prevention

31.3.2.1.1\*

Combustible waste materials such as bark, sawdust, chips, and other debris shall not be permitted to accumulate in a quantity or location that constitutes an undue fire hazard.

31.3.2.1.2

Smoking shall be prohibited except in specified safe locations approved by the AHJ.

31.3.2.1.2.1

Signs that read "No Smoking" shall be posted in those areas where smoking is prohibited.

31.3.2.1.2.2

Signs indicating areas designated as safe for smoking shall be posted in those locations where smoking is permitted.

31.3.2.1.2.3

Smoking areas shall be provided with approved, noncombustible ash receptacles.

31.3.2.1.2.4

Smoking shall be specifically prohibited in and around railroad cars.

31.3.2.1.3

Access into yard areas by unauthorized persons shall be prohibited.

31.3.2.1.4

Storage areas shall be enclosed with a fence equipped with effective gates located as necessary to allow the entry of fire department apparatus.

31.3.2.1.5

Miscellaneous occupancy hazards such as vehicle storage and repair shops, cutting and welding operations, flammable liquid storage, liquefied petroleum gas storage, and similar operations shall be safeguarded in accordance with recognized good practice and this Code.

31.3.2.1.6

Vehicles and other power devices shall be of an approved type and shall be safely maintained and operated.

31.3.2.1.6.1\*

Vehicle fueling operations shall be conducted in specified safe locations, isolated from storage areas and principal operating buildings.

31.3.2.1.6.2

Diesel- or gasoline-fueled vehicles that operate on hogged material or chip piles, in log storage areas, or in lumber storage areas shall be equipped with fixed fire-extinguishing systems of a type approved for off-road vehicles.

31.3.2.1.7

All electrical equipment and installations shall conform to the provisions of Section 11.1.

31.3.2.1.8

Salamanders, braziers, open fires, and similar dangerous heating arrangements shall be prohibited.

31.3.2.1.9

Heating devices shall be limited to approved-type equipment installed in an approved manner.

31.3.2.1.10

Suitable safeguards shall be provided to minimize the hazard of sparks caused by equipment such as refuse burners, boiler stacks, vehicle exhausts, and locomotives.

31.3.2.1.10.1\*

Burning of shavings, sawdust, and refuse materials shall be conducted only in an approved, enclosed refuse burner equipped with an approved spark arrester and located at a safe distance from the nearest point of any yard. (See Section 10.10.)

31.3.2.1.10.2

The design and location of large burners presents special problems, and the AHJ shall be consulted.

31.3.2.1.11

Stacks from solid fuel-burning furnaces and boilers shall be equipped with spark-arresting equipment to prevent hot sparks from reaching the ground, and consideration shall be given to spark hazard in determining the height of such stacks.

31.3.2.1.12

Cutting, welding, or other use of open flames or spark-producing equipment shall not be permitted in the storage area unless by an approved permit system.

31.3.2.2 Exposure Protection

Exposure to the yard shall be protected in accordance with the requirements of 31.3.2.2.1 through 31.3.2.2.2.2.

31.3.2.2.1\*

Yard areas shall be separated from plant operations and other structures so that fire exposure into the yard is minimized.

31.3.2.2.1.1

Minimum separation shall be by means of a clear space permanently available for fire-fighting operations.

31.3.2.2.1.2

The width of the clear space shall be based on the severity of exposure, which varies with the area, height, occupancy, construction, and protection of the exposing structure and the type of stacking and height of adjacent stacks.

31.3.2.2.2\*

Forest, brush, and grass fire exposure shall be minimized by providing adequate clear space that is carefully kept free of combustible vegetation.

31.3.2.2.2.1

Clear space of a width at least equivalent to the fire apparatus access road shall be provided for grass exposures, and clear space of a width not less than 100 ft (30 m) shall be provided for light brush exposures.

31.3.2.2.2.2

In forested areas, a wider clear space than in 31.3.2.2.2.1 shall be provided.

31.3.2.3\* Fire Detection and Extinguishment

A reliable means for prompt transmission of fire alarms to public fire departments and plant emergency organizations shall be provided.

31.3.3 Outside Storage of Lumber and Wood Panel Products at Retail and Wholesale Storage Yards

31.3.3.1 Application

31.3.3.1.1

The requirements of 31.3.3 shall apply to the following areas:

Retail lumberyards handling forest products and other building materials

Wholesale lumber storage yards, including distribution, holding, and transshipment areas

31.3.3.1.2\*

The requirements of 31.3.4 shall apply to other than large outside wholesale and retail distribution yards.

31.3.3.2 General

31.3.3.2.1\*

The fire hazard potential inherent in lumber storage operations with large quantities of combustible materials shall be controlled by a positive fire prevention program under the direct supervision of upper level management that shall include the following:

Selection, design, and arrangement of storage yard areas and materials-handling equipment based upon proven fire prevention and protection principles

Means for early fire detection, transmission of alarm, and fire extinguishment

Fire apparatus access roads to separate large stacks and provide access for effective fire-fighting operations

Separation of yard storage from yard buildings and other exposing properties

Effective fire prevention maintenance program, including regular yard inspections by trained personnel

31.3.3.2.2\*

Water supplies shall be provided in accordance with this Code.

31.3.3.3 Open Yard Storage

31.3.3.3.1\*

Lumber stacks shall be on stable ground, and paved or surfaced with materials such as cinders, fine gravel, or stone.

31.3.3.3.2

The method of stacking shall be stable and in an orderly and regular manner.

31.3.3.3.3\*

The height of stacks shall not exceed 20 ft (6 m) with consideration for stability.

31.3.3.3.4

Where stacks are supported clear of the ground, 6 in. (150 mm) of clearance shall be provided for cleaning operations under the stacks.

31.3.3.3.5

Fire apparatus access roads shall be spaced so that a grid system of not more than 50 ft x 150 ft (15 m x 46 m) is produced.

31.3.3.3.6

Fire apparatus access roads shall comply with Section 18.2.

31.3.3.3.7

Stacking limits shall be designated to indicate yard area and alleyway limits in accordance with 31.3.3.3.7.1 or 31.3.3.3.7.2.

31.3.3.3.7.1

The stacking limits shall be designated with boundary posts having signs that indicate stacking limits unless otherwise permitted by 31.3.3.3.7.2.

31.3.3.3.7.2

Where yards have paved areas, painted boundary limits shall be permitted to be used to designate stacking limits.

31.3.3.4 Exposure Protection

31.3.3.4.1 Exposure to the Yard

31.3.3.4.1.1

Open yard stacking shall be located with not less than 15 ft (4.6 m) clear space to buildings.

31.3.3.4.1.2

Boundary posts with signs designating stacking limits shall be provided to designate the clear space to unsprinklered buildings in which hazardous manufacturing or other operations take place.

31.3.3.4.2\* Exposure From the Yard

31.3.3.4.2.1

Open yard stacking shall be located with not less than 15 ft (4.6 m) clear space to adjacent property lines.

31.3.3.4.2.2

Alternative forms of exposure protection shall be permitted where approved by the AHJ.

31.3.4 Outside Storage of Lumber and Wood Panel Products at Other Than Retail and Wholesale Storage Yards

31.3.4.1\* Application

The requirements of 31.3.4 shall apply to large yard storage areas containing lumber, wood panels, and other similar wood products not intended for retail or wholesale distribution at the site.

31.3.4.2\* General

The fire hazard potential inherent in forest product storage operations with large quantities of combustible materials shall be controlled by a positive fire prevention program under the direct supervision of upper level management that shall include the following:

Selection, design, and arrangement of storage yard areas and materials-handling equipment based on sound fire prevention and protection principles

Means for early fire detection, transmission of alarm, and fire extinguishment

Fire apparatus access roads to separate large stacks and provide access for effective fire-fighting operations

Separation of yard storage from mill or other plant operations and other exposing properties

Effective fire prevention maintenance program, including regular yard inspections by trained personnel

31.3.4.3\* Open Yard Storage

31.3.4.3.1\*

Water supplies shall be provided in accordance with this Code.

31.3.4.3.2

Access to the plant and yard from public highways shall be provided by all-weather roadways capable of supporting fire department apparatus.

31.3.4.3.3

The storage site shall be reasonably level, on solid ground, and paved or surfaced with materials such as cinders, fine gravel, or stone.

31.3.4.3.4

Stack height shall be limited to 20 ft (6 m).

31.3.5 Outside Storage of Ties, Poles, Piles, Posts, and Other Similar Forest Products at Pressure-Treating Plant Yards

31.3.5.1 Application

31.3.5.1.1\*

The requirements of 31.3.5 shall apply to yard storage areas containing treated and untreated ties, poles, piles, posts, and other similar forest products in yards connected with pressure-treating plants.

31.3.5.1.2

The requirements of 31.3.5 shall not apply to pressure-treating buildings, processes, or storage of treating materials.

31.3.5.2\* General

The fire hazard potential inherent in tie storage operations with large quantities of combustible materials shall be controlled by a positive fire prevention program under the direct supervision of upper level management that shall include the following:

Selection, design, and arrangement of storage yard areas and materials-handling equipment based upon sound fire prevention and protection principles

Means for early fire detection, transmission of alarm, and fire extinguishment

Fire apparatus access roads to separate large stacks and provide access for effective fire-fighting operations

Separation of yard storage from mill buildings and other exposing properties

Effective fire prevention maintenance program, including regular yard inspections by trained personnel

31.3.5.3\* Tie Yard Protection

31.3.5.3.1\*

Unobstructed alleyways of sufficient width for hand or cart fire hose laying operations shall be provided between piles.

31.3.5.3.1.1

Alleyways shall not be less than 2 ft (0.6 m) in width.

31.3.5.3.1.2

Where a minimum alleyway width of 4 ft (1.2 m) is provided, the length of the rows shall be not more than 100 ft (30 m).

31.3.5.3.1.3

Where an alleyway width less than 4 ft (1.2 m) is provided, the length of the rows shall be not more than 75 ft (23 m).

31.3.5.3.2\*

Water supplies shall be provided in accordance with this Code.

31.3.5.3.3

Access to the plant and yard from public highways shall be provided by all-weather roadways capable of supporting fire department apparatus.

31.3.5.3.4

The storage site shall be reasonably level, on solid ground, and paved or surfaced with materials such as cinders, fine gravel, or stone.

31.3.5.3.5\*

Stack heights shall be limited to 20 ft (6 m).

31.3.6 Outside Storage of Wood Chips and Hogged Material

31.3.6.1\* Application

The requirements of 31.3.6 shall apply to yard storage areas containing wood chips and hogged material.

31.3.6.2 General

31.3.6.2.1\*

The fire hazard potential inherent in storage piles shall be controlled by a positive fire prevention program under the direct supervision of upper level management that shall include the following:

Selection, design, and arrangement of storage yard areas and materials-handling equipment based upon sound fire prevention and protection principles

Establishment of control over the various factors that lead to spontaneous heating, including provisions for monitoring the internal condition of the pile

Means for early fire detection and extinguishment

Fire apparatus access roads around the piles and access roads to the top of the piles for effective fire-fighting operations

Facilities for calling the public fire department and facilities needed by the fire department for fire extinguishment

Effective fire prevention maintenance program, including regular yard inspections by trained personnel

31.3.6.2.2\*

The following items shall be addressed when establishing operating procedures:

The storage site shall be reasonably level, solid ground, or shall be paved with blacktop, concrete, or other hardsurface material.

Sites shall be cleaned before transferring wood products to the site.

Operating plans for the buildup and reclaiming of the pile shall be based on a turnover time of not more than 1 year under ideal conditions.

) \* Piles containing other than screened chips made from cleaned and barked logs shall be minimized.

\* The pile size shall be limited.

Pile heights shall be kept low, particularly piles that inherently carry a larger percentage of fines and are subject to greater compaction.

Thermocouples shall be installed during pile buildup, or other means for measuring temperatures within the pile shall be provided with regular (normally weekly) reports to management.

\* The pile shall be wetted regularly to help keep fines from drying out and help maintain the moisture content of the surface layer of the pile.

31.3.6.3\* Pile Protection

31.3.6.3.1\*

Piles shall be constructed with an access roadway to the top of the pile in order to reach any part of the pile.

31.3.6.3.2\*

Piles shall not exceed 60 ft (18 m) in height, 300 ft (90 m) in width, and 500 ft (150 m) in length.

31.3.6.3.2.1

Where pile height and width are such that all portions of the pile cannot be reached by direct hose streams from the ground, arrangements shall be made to provide firefighting service in these areas, and small fire stream supplies shall be available on the top of the pile for handling small surface fires and for wetting the pile in dry weather.

31.3.6.3.2.2

When more than one pile exists, they shall be subdivided by fire apparatus access roads having not less than 30 ft (9 m) of clear space at the base of the piles.

31.3.6.3.2.3

Low barrier walls around piles shall be provided to clearly define pile perimeters, prevent creeping, and facilitate cleanup of fire apparatus access roads.

31.3.6.3.3

Where suitable, a small, motorized vehicle amply equipped with portable extinguishing equipment or a water tank and pump shall be provided.

31.3.6.3.3.1

Lightweight ladders that can be placed against the side of the pile shall be placed at convenient locations throughout the yard for use by the plant emergency organization.

31.3.6.3.3.2

Training of the plant emergency organization also shall include procedures and precautions to be observed by yard crews employing power equipment in fighting internal fires.

31.3.6.3.4\*

Portable fire extinguishers for Class A fires shall be provided in accordance with Section 13.6 on all vehicles operating on the pile in addition to the normal Class B units for the vehicle.

31.3.6.3.5\*

Water supplies shall be provided in accordance with this Code.

31.3.6.3.6

All motor and switchgear enclosures shall be provided with approved, portable fire extinguishers suitable for the hazard involved in accordance with Section 13.6.

31.3.6.3.7\*

Power-operated, shovel-type or scoop-type vehicles, dozers, or similar equipment shall be available for use in moving stored material for fire fighting.

31.3.6.3.8

Temporary conveyors and motors on the surface or adjacent to the piles shall not be permitted.

31.3.6.3.9

Physical protection shall be provided to prevent heat sources such as steam lines, air lines, electrical motors, and mechanical drive equipment from becoming buried or heavily coated with combustible material.

31.3.6.3.10

Tramp metal collectors or detectors shall be required on all conveyor and blower systems.

31.3.6.4 Exposure Protection

31.3.6.4.1\*

Incinerators or open refuse burning shall not be permitted in any area where sparks could reach the storage piles.

31.3.6.4.2\*

A clear space of not less than 15 ft (4.6 m) shall be maintained between piles and exposing structures, yard equipment, or stock, depending on the degree of exposure hazard.

31.3.6.4.3\*

Pile-to-pile clearance of not less than 30 ft (9 m) at the base of the pile shall be provided.

31.3.6.5 Emergency Action Plan

The facility shall have an emergency action plan for monitoring, controlling, and extinguishing spot fires.

31.3.7\* Storage and Processing of Wood Chips, Hogged Material, Fines, Compost, and Raw Products at Yard Waste Recycling Facilities

31.3.7.1

The storage and processing of wood chips, hogged material, fines, compost, and raw products produced from yard waste recycling facilities shall comply with 31.3.6 and 31.3.7.

31.3.7.2

When not protected by a fixed fire-extinguishing system in accordance with Chapter 13, piles shall not exceed 25 ft (7.6 m) in height, 150 ft (45 m) in width, and 250 ft (76.2 m) in length.

31.3.7.3 Static Pile Protection

31.3.7.3.1

Static piles shall be monitored by an approved means to measure temperatures within the piles.

31.3.7.3.2

Internal pile temperatures shall be recorded weekly.

31.3.7.3.3

Records shall be kept on file at the facility and made available for inspection.

31.3.7.3.4

The facility shall have an operational plan indicating procedures and schedules for the inspection, monitoring, and restricting of excessive internal temperatures in static piles.

31.3.7.4 Fire Protection

31.3.7.4.1

Conveyor tunnels and combustible enclosures that pass under a pile shall be protected with automatic sprinklers complying with Section 13.3.

31.3.7.4.2

Combustible or enclosed conveyor systems shall be protected with automatic sprinklers complying with Section 13.3.

31.3.8 Outside Storage of Logs

31.3.8.1 Application

31.3.8.1.1\*

The requirements of 31.3.8 shall apply to log yard storage areas containing saw, plywood veneer, or pulpwood logs stored in ranked piles commonly referred to as cold decks.

31.3.8.1.2

The requirements of 31.3.8 shall not apply to cordwood.

31.3.8.2\* General

The fire hazard potential inherent in log storage operations with large quantities of combustible materials shall be controlled by a positive fire prevention program under the direct supervision of upper level management that shall include the following:

Selection, design, and arrangement of storage yard areas and materials-handling equipment based on sound fire prevention and protection principles

Means for early fire detection, transmission of alarm, and fire extinguishment

Fire apparatus access roads to separate large piles and provide access for effective fire-fighting operations

Separation of yard storage from mill operations and other exposing properties

Effective fire prevention maintenance program, including regular yard inspections by trained personnel

31.3.8.3\* Log Yard Protection

31.3.8.3.1

The storage site shall be reasonably level, on solid ground, and paved or surfaced with materials such as cinders, fine gravel, or stone.

31.3.8.3.2

Access to the plant and yard from public highways shall be provided by all-weather roadways capable of supporting fire department apparatus.

31.3.8.3.3\*

All sides of each cold deck shall be accessible by means of fire apparatus access roads.

31.3.8.3.3.1

A fire apparatus access road width of 11/2 times the pile height but not less than 20 ft (6 m) shall be provided, with fire apparatus access roads between alternate rows of two pile groups providing a clear space of at least 100 ft (30 m).

31.3.8.3.3.2\*

Each cold deck shall not exceed 500 ft (150 m) in length, 300 ft (90 m) in width, and 20 ft (6 m) in height.

31.3.8.3.3.3\*

Fire apparatus access roads for access across each end, with a clear space of not less than 100 ft (30 m) to adjacent pile rows or other exposed property, shall be provided.

31.3.8.3.3.4\*

The size of cold decks shall be permitted to be increased where additional fire flow and fixed fire protection equipment is provided and the approval of the AHJ is obtained.

31.3.8.3.4

Water supplies shall be provided in accordance with this Code.

31.3.8.3.5

Dynamite shall never be used as a means to reclaim frozen log piles.

31.3.8.3.6\*

During dry weather, piles shall be wet down.

31.3.9 Wood Processing and Woodworking Facilities

Dust control shall be in accordance with NFPA 664 for combustible dust-producing operations that occupy areas of more than 5000 ft2 (464 m2), or to areas where dust-producing equipment requires an aggregate dust collection flow rate of more than 1500 ft3/min (2549 m3/hr).

31.3.10 Outside Storage of Biomass Feedstock

31.3.10.1

The fire hazard potential inherent in biomass feedstock storage operations with large quantities of combustible materials shall be controlled by a positive fire prevention program under the direct supervision of upper level management that shall include the following:

Selection, design, and arrangement of storage yard areas and materials-handling equipment based upon proven fire prevention and protection principles

Means for early fire detection, transmission of alarm, and fire extinguishment

Establishment of control over the various factors that lead to spontaneous heating, including provisions for monitoring the internal condition of the pile

Fire apparatus access roads to separate large stacks and provide access for effective fire-fighting operations

Separation of yard storage from yard buildings and other exposing properties

Effective fire prevention maintenance program, including regular yard inspections by trained personnel

31.3.10.2

Bale stacks shall not exceed 25 ft (7.6 m) in height, 150 ft (45 m) in width, and 250 ft (76.2 m) in length.

31.3.10.3

The storage site shall be reasonably level, on solid ground.

31.3.10.4

Access to the plant and yard from public highways shall be provided by all-weather roadways capable of supporting fire department apparatus.

31.3.10.5

All sides of each storage site shall be accessible by means of fire apparatus access roads.

31.3.10.6

Where more than one pile exists, they shall be subdivided by fire apparatus access roads having not less than 30 ft (9 m) of clear space at the base of the piles.

31.3.10.7

Power-operated, shovel-type or scoop-type vehicles, dozers, bale movers, or similar equipment shall be available for use in moving stored material for fire fighting.

Training of the plant organization also shall include procedures and precautions to be observed by yard crews employing power equipment in fighting internal fires.

31.3.10.9

Portable fire extinguishers for Class A fires shall be provided in accordance with Section 13.6 on all vehicles operating in the storage yard in addition to the normal Class B units for the vehicle.

31.3.10.10

Lightning protection shall be provided for the outside storage yard in accordance with NFPA 780.

31.3.10.11

Outside storage yards shall be secured against unauthorized access in an approved manner.

31.3.10.12

Water supplies shall be provided in accordance with this Code.