

**Chapter 296-99 WAC**  
**Safety Standards for Grain Handling Facilities**  
(Form Number F414-051-000)

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This book contains rules for safety standards for grain handling facilities, as adopted under the Washington Industrial Safety and Health Act of 1973 (Chapter 49.17 RCW).

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**Chapter 296-99 WAC  
SAFETY STANDARDS FOR  
GRAIN HANDLING FACILITIES**

<b>WAC</b>		<b>Page</b>
<b>LAST UPDATED 04/01/2007</b>		
296-99-010	What safety hazards does this chapter require the employer to control?	1
296-99-015	What grain-handling operation does this chapter cover?	1
296-99-020	What definitions apply to this chapter?	1
296-99-025	What are the requirements for an emergency action plan?	2
296-99-030	What training must an employer provide for employees?	2
296-99-035	When must an employer issue a hot work permit?	3
296-99-040	What practices must an employer follow for entry into grain storage structures?	3
296-99-045	What information must an employer provide to contractors?	4
296-99-050	What elements must an employer include in the housekeeping program?	4
296-99-055	What is the maximum allowable grate opening size?	5
296-99-060	How must filter collectors be installed?	5
296-99-065	What preventive maintenance program must an employer implement?	5
296-99-070	How must grain stream processing equipment be equipped?	6
296-99-075	How many means of emergency escape must an employer provide?	6
296-99-080	How must continuous-flow bulk raw grain dryers be equipped and installed?	7
296-99-085	What special requirements apply to inside bucket elevators?	7
296-99-090	Reserved.	8
296-99-093	Reserved.	8
296-99-095	Reserved.	8

### **WAC 296-99-010 What safety hazards does this chapter require the employer to control?**

This chapter directs the employer to control dust fires, explosions and other safety hazards in grain handling facilities including the waterfront dock areas at marine terminals (chapter 296-56 WAC will not apply).

All provisions from chapters 296-24, 296-62, and 296-800 WAC also apply. If rules in either of these chapters conflict with rules in chapter 296-99 WAC, chapter 296-99 WAC will prevail.

[Statutory Authority: RCW 49.17.010, .040, .050. 01-11-038 (Order 99-36), § 296-99-010, filed 05/09/01, effective 09/01/01. Statutory Authority: Chapter 49.17 RCW. 97-09-079 (Order 96-17), 296-99-010, filed 11/03/97, effective 01/01/98. 88-23-054 (Order 88-25), 296-99-010, filed 11/14/88.]

### **WAC 296-99-015 What grain-handling operations does this chapter cover?**

(1) WAC 296-99-010 through 296-99-070 apply to:

- Dry grinding operations of soycake;
- Dry corn mills;
- Dust pelletizing plants;
- Feed mills;
- Flour mills;
- Flat storage structures;
- Grain elevators;
- Rice mills; and
- Soybean flaking operations.

(2) WAC 296-99-075, 296-99-080, and 296-99-085 apply only to grain elevators.

(3) Chapter 296-99 WAC does not apply to alfalfa storage or processing operations if they do not use grain products.

[Statutory Authority: Chapter 49.17 RCW. 97-09-079 (Order 96-17), 296-99-015, filed 11/03/97, effective 01/01/98. 90-03-029 (Order 89-20), 296-99-015, filed 1/11/90, effective 2/26/90; 88-23-054 (Order 88-25), 296-99-015, filed 11/14/88.]

### **WAC 296-99-020 What definitions apply to this chapter?**

**“Choked leg”** means excess material buildup that stops the movement of grain and of the bucket elevator. A bucket elevator is not considered choked if it moves and the boot and discharge are clear.

**“Flat storage structure”** means a grain storage structure that:

- Can not empty by gravity alone;
- Can be entered through an opening at ground level; and
- Must be entered to remove leftover grain.

**“Fugitive grain dust”** means combustible grain dust particles, accumulated inside storage structures, that are small enough to pass through a U.S. Standard 40 mesh sieve (425 microns or less).

**“Grain”** means raw and processed grain of cereal grass seeds and grain products handled in facilities within the scope of WAC 296-99-015(1).

**“Grain elevator”** means a facility in which bulk raw grains are stored by means of elevating machinery for later shipment.

**“Hot work”** means work that involves electric or gas welding, cutting, brazing or similar heat-producing tasks that could be a source of ignition.

### WAC 296-99-020 (Cont.)

**“Inside bucket elevator”** means a bucket elevator with the boot and more than twenty percent of the total leg height (above grade or ground level) inside a grain elevator structure. Bucket elevators used inside of rail or truck dump sheds are not considered inside bucket elevators.

**“Lagging”** means a covering on drive pulleys used to increase the driving friction between the pulley and the belt. [Statutory Authority: Chapter 49.17 RCW. 97-09-079 (Order 96-17), 296-99-020, filed 11/03/97, effective 01/01/98. 88-23-054 (Order 88-25), 296-99-020, filed 11/14/88.]

**WAC 296-99-025 What are the requirements for an emergency action plan?** The employer must develop and implement an emergency action plan that meets the requirements of WAC 296-24-567.

[Statutory Authority: Chapter 49.17 RCW. 97-09-079 (Order 96-17), 296-99-025, filed 11/03/97, effective 01/01/98. 88-23-054 (Order 88-25), 296-99-025, filed 11/14/88.]

### WAC 296-99-030 What training must an employer provide for employees?

- (1) The employer must train employees:
  - (a) Annually; and
  - (b) Whenever a new job assignment exposes an employee to a new hazard.
- (2) The employer must ensure that employees are trained in the following:
  - (a) General safety precautions against fires and explosions, including how to recognize and prevent the hazards of excess dust accumulation and ignition sources.
  - (b) Specific procedures and safety practices for job tasks including, but not limited to:
    - Cleaning grinding equipment;
    - Clearing choked legs;
    - Housekeeping;
    - Hot work; and
    - Preventive maintenance.
- (3) The employer must provide additional training for employees who are assigned special tasks, including but not limited to:
  - (a) Procedures for grain storage entry according to chapter 296-809 WAC, Confined spaces, and how to:
    - Control hazardous energy (lockout/tagout) according to chapter 296-803 WAC, Lockout/tagout (control of hazardous energy);
    - Avoid getting buried by moving grain (engulfment);
    - Avoid falling from heights; and
    - Prevent mechanical hazards.
  - (b) How to handle flammable or toxic substances.

[Statutory Authority: RCW 49.17.010, .020, .040, .050, and .060. 07-03-163 (Order 06-30), § 296-99-030, filed 01/24/07, effective 04/01/07. Statutory Authority: Chapter 49.17 RCW. 97-09-079 (Order 96-17), 296-99-030, filed 11/03/97, effective 01/01/98. 88-23-054 (Order 88-25), 296-99-030, filed 11/14/88.]

**WAC 296-99-035 When must an employer issue a hot work permit?**

- (1) Before allowing an employee to start any hot work, the employer must:
  - (a) Issue to the employee a permit that states that all safety precautions required by WAC 296-24-695 are in place; and
  - (b) Keep the permit on file until the hot work is complete.
- (2) The employer may allow an employee to perform hot work without a permit if:
  - (a) The employer's representative personally monitors the hot work to prevent employee exposure to injury from either fire or explosion during the entire operation; or
  - (b) The hot work is done in welding shops authorized by the employer; or
  - (c) The hot work is done in hot work areas authorized by the employer which are located outside of the grain handling structure.

[Statutory Authority: Chapter 49.17 RCW. 97-09-079 (Order 96-17), 296-99-035, filed 11/03/97, effective 01/01/98. 88-23-054 (Order 88-25), 296-99-035, filed 11/14/88.]

**WAC 296-99-040 What practices must an employer follow for entry into grain storage structures?**

This section applies to employee entry into all grain storage structures.

- (1) The employer must ensure that the practice of walking down grain is prohibited. Walking down grain means an employee walks on grain to make it flow within or out from a grain storage structure, or an employee is on moving grain.
- (2) The employer must ensure that during the entry and occupation of a storage structure the employee uses:
  - A body harness with a lifeline; or
  - A boatswain's chair that meets the requirements of chapter 296-874 WAC, Scaffolds:
  - (a) The employee is exposed to a fall hazard such as when entering from the top or above the level of the stored grain; or
  - (b) The employee is exposed to an engulfment hazard such as when entering at the level of the stored grain, or while walking or standing on the grain. The lifeline must be rigged so that its position and length will prevent the employee from sinking below waist level.
- (3) The employer must ensure that during the occupation of storage structures, including walking or standing on grain, employees are protected from hazards related to:
  - Mechanical;
  - Electrical;
  - Hydraulic; and
  - Pneumatic equipment.

By using safeguards, lockout-tagout, or other equally effective means. All provisions for the control of hazardous energy (lockout/tagout) from chapter 296-803 WAC apply to this chapter.

**WAC 296-99-040 (Cont.)**

- (4) The employer must ensure that employees are prohibited from entering any storage structure where a build-up of grain overhead (bridging) or on the sides could fall and bury them.
- (5) The employer must ensure, as minimum precautions, that employee entry and occupation of all grain storage structures including flat storage structures is done according to all applicable requirements of chapter 296-809 WAC, Confined spaces, when the storage structure:
  - Has limited or restricted means of entry and exit; and
  - Is not designed for continuous employee occupancy.
- (6) The employer may allow an employee to perform confined space entry work in grain storage structures without a permit if the employer's representative personally monitors the work to prevent employee exposure to illness or injury from atmospheric hazards during the entire operation.

[Statutory Authority: RCWs 49.17.010, 49.17.040, 49.17.050, 49.17.440 and 49.17.060. 12-01-086 (Order 08-32), § 296-99-040, filed 12/20/11, effective 02/01/12. Statutory Authority: RCW 49.17.010, .020, .040, .050, and .060. 07-03-163 (Order 06-30), § 296-78-040, filed 01/24/07, effective 04/01/07. Statutory Authority: RCW 49.17.010, .040, .050. 01-11-038 (Order 99-36), § 296-99-040, filed 05/09/01, effective 09/01/01 Statutory Authority: Statutory Authority: Chapter 49.17 RCW. 97-09-079 (Order 96-17), 296-99-040, filed 11/03/97, effective 01/01/98. 88-23-054 (Order 88-25), 296-99-040, filed 11/14/88.]

**WAC 296-99-045 What information must an employer provide to contractors?**

- (1) The employer must inform contractors working at the grain handling facility of:
  - (a) General safety rules; and
  - (b) Specific fire and explosion hazards related to the contractor's work and work area.
- (2) The employer must explain the emergency action plan to each contractor.

[Statutory Authority: Chapter 49.17 RCW. 97-09-079 (Order 96-17), 296-99-045, filed 11/03/97, effective 01/01/98. 88-23-054 (Order 88-25), 296-99-045, filed 11/14/88.]

**WAC 296-99-050 What elements must an employer include in the housekeeping program?**

- (1) The employer must develop and enforce a written housekeeping program that:
  - (a) Establishes frequency and methods for reducing and cleaning up hazardous accumulations of fugitive grain dust;
  - (b) Identifies priority areas for clean up of hazardous accumulations of fugitive grain dust, including floor areas:
    - Within thirty-five feet (10.7 m) of inside bucket elevators;
    - Of enclosed grinding equipment; and
    - Of enclosed grain dryers located inside the facility; and
  - (c) Requires that fugitive grain dust is cleaned up immediately whenever accumulations exceed one-eighth inch (.32 cm) at priority housekeeping areas, or provide protection against fire and explosion that is equal to the required clean up.
- (2) The employer must prohibit the use of compressed air to blow dust from ledges, walls, and other areas unless all machinery that provides an ignition source in the area is shut down, and all other known potential ignition sources in the area are removed or controlled.

### **WAC 296-99-050 (Cont.)**

- (3) The employer must also ensure that the housekeeping program addresses procedures for removing grain and product spills from work areas. Spills are not considered fugitive grain dust accumulations.

[Statutory Authority: Chapter 49.17 RCW. 97-09-079 (Order 96-17), 296-99-050, filed 11/03/97, effective 01/01/98. 91-11-070 (Order 91-01), 296-99-050, filed 5/20/91, effective 6/20/91; 90-03-029 (Order 89-20), 296-99-050, filed 1/11/90, effective 2/26/90; 88-23-054 (Order 88-25), 296-99-050, filed 11/14/88.]

**WAC 296-99-055 What is the maximum allowable grate opening size?** The employer must ensure that receiving-pit feed openings, such as truck or railcar receiving-pits, are covered by grates with maximum openings of two and one-half inches (6.35 cm).

[Statutory Authority: Chapter 49.17 RCW. 97-09-079 (Order 96-17), 296-99-055, filed 11/03/97, effective 01/01/98. 88-23-054 (Order 88-25), 296-99-055, filed 11/14/88.]

### **WAC 296-99-060 How must filter collectors be installed?**

- (1) The employer must ensure that, on a pneumatic dust collection system, each fabric dust filter collector has a monitoring device that will show a pressure drop across the surface of its filter.
- (2) The employer must ensure that each filter collector installed after March 30, 1988, is:
- (a) Located outside the facility; or
  - (b) When located inside the facility, protected by an explosion suppression system; or
  - (c) Isolated by a structure with at least a one hour fire-resistance rating:
    - Next to an exterior wall;
    - Vented to the outside; and
    - The vent and ductwork must resist rupture from intense heat.

[Statutory Authority: Chapter 49.17 RCW. 97-09-079 (Order 96-17), 296-99-060, filed 11/03/97, effective 01/01/98. 88-23-054 (Order 88-25), 296-99-060, filed 11/14/88.]

### **WAC 296-99-065 What preventive maintenance program must an employer implement?**

- (1) The employer must implement a written program that covers the requirements of chapter 296-803 WAC, Lockout/tagout, (control of hazardous energy).
- (2) The employer must implement preventive maintenance procedures that include the following:
- (a) Conducting regularly scheduled inspections for specified machinery.
  - (b) Preparing written inspection reports kept on file that include:
    - The date of each inspection;
    - The name of the inspector; and
    - The serial number, or other identification of the machinery as described next in (c) of this subsection.

**WAC 296-99-065 (Cont.)**

- (c) Conducting regularly scheduled inspections and completing immediate repairs of the mechanical equipment and safety controls of the following machinery:
- Grain dryers;
  - Grain stream processing equipment;
  - Dust collection systems including their filter collectors that malfunction or operate below designed efficiency;
  - Overheated bearings; and
  - Slipping or misaligned belt drives for inside bucket elevators.
  - When immediate repairs are not feasible, then the affected machine must be taken out of service.
- (d) Performing lubrication and other maintenance according to manufacturers' recommendations or more often when needed, such as when operating records indicate that a more stringent schedule is necessary.

[Statutory Authority: RCW 49.17.010, .020, .040, .050, and .060. 07-03-163 (Order 06-30), § 296-78-065, filed 01/24/07, effective 04/01/07. Statutory Authority: Chapter 49.17 RCW. 97-09-079 (Order 96-17), 296-99-065, filed 11/03/97, effective 01/01/98. 88-23-054 (Order 88-25), 296-99-065, filed 11/14/88.]

**WAC 296-99-070 How must grain stream processing equipment be equipped?**

The employer must ensure that the following grain stream processing equipment has an effective means of removing ferrous material from the incoming grain:

- Hammer mills;
- Grinders; and
- Pulverizers.

[Statutory Authority: Chapter 49.17 RCW. 97-09-079 (Order 96-17), 296-99-070, filed 11/03/97, effective 01/01/98. 88-23-054 (Order 88-25), 296-99-070, filed 11/14/88.]

**WAC 296-99-075 How many means of emergency escape must an employer provide?**

The employer must provide the following number of emergency escape means:

<b>Structure</b>	<b>Number of escape means</b>
Galleries (bin decks)	Two
Tunnels of grain elevators constructed after November 14, 1988	Two
Tunnels of grain elevators constructed on or before November 14, 1988	One

[Statutory Authority: Chapter 49.17 RCW. 97-09-079 (Order 96-17), 296-99-075, filed 11/03/97, effective 01/01/98. 88-23-054 (Order 88-25), 296-99-075, filed 11/14/88.]

**WAC 296-99-080 How must continuous-flow bulk raw grain dryers be equipped and installed?**

- (1) The employer must ensure that all direct-heat grain dryers have automatic controls that:
  - (a) Shut off the fuel supply in case of power, flame, or ventilation airflow shut-off; and
  - (b) Stop the grain flow into the dryer if the dryer exhaust gets too hot.
- (2) The employer must ensure that each direct-heat grain dryer installed after March 30, 1988, is:
  - (a) Located outside the grain elevator; or
  - (b) When located inside the grain elevator, protected by a fire or explosion suppression system; or
  - (c) Isolated by a structure with at least a one hour fire-resistance rating.

[Statutory Authority: Chapter 49.17 RCW. 97-09-079 (Order 96-17), 296-99-080, filed 11/03/97, effective 01/01/98. 88-23-054 (Order 88-25), 296-99-080, filed 11/14/88.]

**WAC 296-99-085 What special requirements apply to inside bucket elevators?**

- (1) The employer must prohibit jogging of a bucket elevator to free a choked leg.  
  
“**Jogging**” means to start and stop drive motors repeatedly over short intervals.
- (2) The employer must ensure that all belts and lagging purchased after March 30, 1988, are conductive and have a maximum surface electrical resistance of 300 megohms.
- (3) The employer must ensure that all bucket elevators have safe access to the head pulley section for inspection of the head pulley, lagging, belt, and discharge throat. The boot section must also have safe access for its clean-out and inspection of the pulley and belt.
- (4) The employer must:
  - (a) Mount bearings externally to the leg casing; or
  - (b) Have vibration and temperature monitoring; or
  - (c) Have other means to monitor the condition of bearings mounted inside or partially inside the leg casing.
- (5) The employer must ensure that bucket elevators have a motion detection device that will stop the elevator if belt speed is reduced to less than eighty percent of normal operating speed.
- (6) The employer must:
  - (a) Ensure that bucket elevators have a belt alignment monitoring device that will initiate an alarm to employees when the belt is not tracking properly; or
  - (b) Use a system to keep the belt tracking properly.
- (7) Subsections (5) and (6) of this section do not apply to grain elevators with a permanent storage capacity of less than one million bushels, if daily visual inspection is made of bucket movement and belt tracking.

**WAC 296-99-085 (Cont.)**

- (8) Subsections (4), (5), and (6) of this section do not apply to the following:
- (a) Bucket elevators with an operational fire and explosion suppression system capable of protecting at least the head and boot section of the bucket elevator; or
  - (b) Bucket elevators with pneumatic or other dust control systems or methods that keep the dust concentration inside the bucket elevator at least twenty-five percent below the lower explosive limit at all times during operations.

[Statutory Authority: Chapter 49.17 RCW. 97-09-079 (Order 96-17), 296-99-085, filed 11/03/97, effective 01/01/98. 88-23-054 (Order 88-25), 296-99-085, filed 11/14/88.]

**WAC 296-99-090 Reserved.**

[Statutory Authority: Chapter 49.17 RCW. 97-09-079 (Order 96-17), 296-99-090, filed 11/03/97, effective 01/01/98. 88-23-054 (Order 88-25), 296-99-090, filed 11/14/88.]

**WAC 296-99-093 Reserved.**

[Statutory Authority: Chapter 49.17 RCW. 97-09-079 (Order 96-17), 296-99-093, filed 11/03/97, effective 01/01/98. 88-23-054 (Order 88-25), 296-99-093, filed 11/14/88.]

**WAC 296-99-095 Reserved.**

[Statutory Authority: Chapter 49.17 RCW. 97-09-079 (Order 96-17), 296-99-095, filed 11/03/97, effective 01/01/98. 88-23-054 (Order 88-25), 296-99-095, filed 11/14/88.]