

**STANDARDS PRESENTATION
TO
CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD**

PROPOSED STATE STANDARD,
TITLE 8, CHAPTER 4

Amend Section 6505 to read:

§6505. Definitions.

* * * * *

Owner-User Inspection Agency. An owner or user of pressure vessels who maintains a regularly established inspection department whose organization and inspection procedures ~~are~~ have been accepted ~~able to~~ by the Division.

* * * * *

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

Amend Section 6533 to read:

§6533. Pipe Lines, Fittings, and Valves.

(a) General.

(1) Pipe lines, piping, fittings, and valves installed prior to [_____ * _____], shall be installed, supported and maintained to withstand the stresses imposed by the internal and external loads, and by contraction, expansion and vibration. This section does not apply to drill pipe, casing or tubing in a well.

(2) The design, fabrication, and assembly of piping systems installed on or after [_____ * _____], and the testing, inspection, and repair of all piping systems shall comply with Article 146 of the General Industry Safety Orders, and ASME B31.3-2002, Process Piping, ASME B31.4- 2002, Pipeline Transportation Systems for Liquid Hydrocarbons and Other Liquids, ASME B31.8- 2003, Gas Transmission and Distribution Piping Systems, or API 1104, Nineteenth Edition, September 1999, Welding of Pipelines and Related Facilities (including the October 31, 2001 Errata), as applicable, which are hereby incorporated by reference.

(3) Each owner or user of piping shall establish an inspection and maintenance program that will ensure that all piping has sufficient integrity for the intended service.

(A) Each owner or user shall employ appropriate engineering, inspection, classification and recording systems that meet all requirements of this Article.

(b) Inspections.

(1) The inspector shall be an authorized piping inspector as defined in Section 4 of API 570 Piping Inspection Code, Second Edition, October 1998, Addendum 3, August 2003, which is hereby incorporated by reference.

(2) The inspector or piping engineer may employ the principles of API 570-2003 when developing inspection strategies and methodologies.

[* OAL to insert the effective date of the standard.]

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(3) The piping owner or user shall establish piping inspection risk classes by grouping piping systems into common classes of service, pressure/temperature rating, and risk.

(A) The classification of piping systems shall be determined by a qualified person and shall be based on:

1. The potential for the piping to fail due to corrosion, erosion, and other damage mechanisms;
2. The piping location, history, design basis, operating conditions, and previous inspections; and,
3. The consequences of piping failure relative to its location to employees or the public, potential damage to adjacent equipment, or extent of any environmental impact.

(B) Piping inspection risk classes shall be specified as either Class 1, Class 2, Class 3 or Class 4 as follows:

1. Class 1 piping systems are those that will result in an immediate emergency should a leak occur. Examples include, but are not limited to:

- a. Piping systems that contain flammable services that may auto refrigerate;
- b. Piping systems that contain hydrogen sulfide greater than 3%;
- c. Piping systems that contain highly reactive chemicals such as hydrofluoric acid or anhydrous hydrogen chloride,
- d. Piping systems located over or adjacent public thoroughfares and continuously flowing waterways.

2. Class 2 piping systems are those that contains hydrocarbons that will vaporize slowly during release, strong acids and caustic, hydrogen, fuel gas, or natural gas.

3. Class 3 piping systems are those that contain a flammable liquid that does not significantly vaporize and is potentially harmful to human tissue, but located in remote areas.

4. Class 4 piping systems are those where there is minimal risk based on the likelihood and consequence of failure, such as low pressure water piping, lube oil piping, low pressure piping within secondary containments, or low pressure piping containing a chemical that is not flammable, corrosive, toxic, or reactive.

(4) Inspection intervals and inspection strategy shall be determined by the piping risk classification and the remaining life and corrosion rate calculations. Remaining life and corrosion rate calculations shall be performed in accordance with API 570-2003, Section 7. When establishing maximum allowable pressure and temperature ratings, the material allowable stress and appropriate non-destructive examination factors from the original code of construction shall be used.

(A) Any signs of leakage or deterioration detected in the interval between inspections shall require inspection of that piping and re-evaluation by the piping inspector, the piping engineer, or a corrosion specialist of the inspection interval for that piping class. This re-evaluation may necessitate a decrease in the inspection interval or an increase in the number of inspection locations. If service conditions change the risk classification, the interval between inspections shall be re-evaluated.

(B) The piping inspection interval for each risk classification shall be established by individuals experienced in piping corrosion and inspection, and shall be set as follows:

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1. Class 1 piping systems shall be inspected on a representative sample of piping, as corrosion damage may cause generalized wall thickness loss. The inspection interval shall not exceed 5 years or half the remaining life as determined from the corrosion rate calculation, whichever is less. In cases where the remaining life is estimated to be less than 4 years, the inspection interval may be the full remaining life up to 2 years maximum and the number of piping systems inspected shall be increased within that class to detect worst case deterioration rates.

2. Class 2 piping systems shall be inspected on a representative sample of piping. The inspection interval shall not exceed 10 years or half the remaining life as determined from the corrosion rate calculation, whichever is less.

3. Class 3 piping systems shall be inspected on a representative sample of piping. The inspection interval shall not exceed 15 years or 3/4 of the remaining life as determined from the corrosion rate calculation, whichever is less.

4. Class 4 piping systems shall be inspected and tested in accordance with good engineering practices.

(5) When the inspection of a piping system shows measured losses, the inspector or the piping engineer shall evaluate those losses. This evaluation shall include: establishing maximum allowable working pressure, performing remaining life calculations, retirement thickness determination and assessment of wall losses from general, local or pitting corrosion.

(6) The inspector or the piping engineer shall review all repairs to Class 1 piping systems. Repairs to other piping classes shall be reviewed by the inspector or piping engineer, or the inspector may give prior authorization for specific repair procedures, provided the inspector has reviewed and approved the competency of the repair organization.

(7) Each owner or user shall maintain records of piping inspections. Records shall include classification, inspection type, inspection interval, inspector, inspection results, and corrective actions taken for all piping systems covered.

~~(b)~~(c) Pressure relief devices and valves.

(1) Low pressure piping systems connected to a high pressure piping system shall be protected with pressure relief devices that are set to open at a pressure not to exceed the lowest rated working pressure of any component they protect.

~~(e)~~(2) Open-ended pipe lines, bleeder lines and flow lines which can be subjected to pressure shall be securely anchored to prevent swinging, revolving, or whipping.

~~(d)~~(3) Safe access shall be provided to all valves, or their remote controls, whenever it is necessary to operate them.

~~(e)~~(4) Valves or their remote controls shall be provided with a means of ready and safe access when required by the frequency of operation or the necessity of emergency operation. Included in this classification are:

~~(1)~~(A) Valves manually operated as often as once a shift.

~~(2)~~(B) Valves on fuel lines to a plant, unit, or internal combustion engine.

~~(3)~~(C) Line valves.

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~~(f)~~(5) Manually operated valves required for the emergency shutdown of units shall be maintained in operating condition and provided with ready and safe access. Such valves shall plainly indicate whether they are opened or closed.

~~(g)~~(6) Quarter turn valves shall be provided with a means to indicate whether the valve is in the open or closed position.

~~(h)~~(7) If a permanently attached handle is used on a quarter turn valve, it shall be installed or placed on the valve in such a position that the handle is at right angles to the line when in the closed position, and parallel with the line when in the open position. If compliance with the provisions of the subsection obstructs a passageway or walkway, the handle may be bent so as to provide clearance.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

Amend Section 6551 to read:

§6551. Pressure Vessels, and Boilers and Pressure Relief Devices.

(a) All unfired pressure vessels, boilers, and fired pressure vessels shall meet all applicable requirements of the Unfired Pressure Vessel Safety Orders and the Boiler and Fired Pressure Vessel Safety Orders unless the design, material and construction of the pressure vessel or boiler is accepted by the Division as equivalent to the ASME Code.

~~(b) No pressure vessel shall be operated above its maximum allowable working pressure at coincident design temperature(s).~~ Maximum allowable working pressure.

~~(c)~~(1) The employer shall establish, or cause to be established, the maximum allowable working pressure of each boiler or pressure vessel in accordance with the rules of recognized pressure vessel codes applicable to the pressure vessel service involved.

~~(2) No pressure vessel shall be operated above its maximum allowable working pressure at coincident design temperature(s).~~

~~(3) The maximum allowable working pressure for each vessel shall be evaluated at intervals sufficiently frequent to give due consideration to corrosion and other factors causing deterioration. The original code of construction shall be used to establish the allowable stresses and joint efficiencies when re-rating, de-rating or calculating the pressure boundary minimum thickness of a vessel.~~

~~(c) Maintenance, inspection, and repair procedures of unfired pressure vessels shall comply with API 510, Pressure Vessel Inspection Code, Eighth Edition, June 1997, Addendum 4, August 2003; or the ANSI/NB-23, American National Standard/National Board Inspection Code, 2004 Edition; which are hereby incorporated by reference.~~

~~(1) A written risk-based inspection program, as described in API 510-2003 and API 580-2002, may be used to increase the internal or on-stream inspection limits required by API 510-2003 Section 6.4 to a maximum of 15 years, or the external inspection interval described by API 510-2003, Section 6.3 to a maximum of 10 years, provided it is reviewed and accepted by the Division before the program is implemented, and every three years thereafter. Any revisions~~

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made to the accepted risk-based inspection program must also be submitted, reviewed, and accepted by the Division.

(A) The risk-based inspection program shall not be used for pressure vessels and boilers that require "Permits to Operate" issued by the Division.

(B) The plan shall not be used for safety relief devices.

(C) The program shall indicate:

1. Acceptance by signature of plant management.

2. Involvement of plant operating, engineering, inspection, and maintenance personnel by signature.

3. The type of vessels covered.

4. The methodology used to create the program.

5. A listing of the vessels covered by the program, with a clear indication of those vessels that have an inspection interval beyond the 10-year or half remaining life as required by API 510-2003, Section 6.4.

(2) If a written fitness-for-service program, as described in Section 5.8 of API 510-2003, is used to evaluate pressure vessels for continued service when found to have degradation that could affect their load carrying capability, it shall comply with API 579, Fitness-for-Service, Recommended Practice, First Edition, January 2000, which is hereby incorporated by reference.

(A) The fitness-for-service program shall be submitted to the Division in writing, and shall be reviewed and accepted by the Division before the program is implemented, and every three years thereafter. Any revisions made to the accepted fitness-for-service program must also be submitted, reviewed and accepted by the Division.

(B) The program shall indicate:

1. Acceptance by signature of plant management.

2. The type of vessels covered.

3. How fitness-for-service results are documented. As a minimum, this documentation shall include acceptance of the fitness-for-service evaluation by signature of a technically competent company employee that is designated to review and accept the evaluation.

4. Involvement of plant operating, engineering, inspection, and maintenance personnel by signature.

5. The procedures in place for notifying the Division no later than the next business day of initiating a level 2 or 3 fitness-for-service evaluation as described in API 579-2000. Level 2 and 3 evaluations are subject to the acceptance by the Division. If the review is subsequent to returning the vessel to service, the Division may, in its reasonable discretion, require the unit be removed from service.

(d) Repair and alterations.

(1) Repair and alteration of boilers and pressure vessels shall meet all applicable requirements of the Unfired Pressure Vessel Safety Orders and the Boiler and Fired Pressure Vessel Safety Orders, and shall comply with API 510, Pressure Vessel Inspection Code, Eighth Edition, June 1997, Addendum 4, August 2003; or the ANSI/NB-23, American National Standard/National Board Inspection Code, 2004 Edition; which are hereby incorporated by reference.

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~~(1) Maintenance inspection and repair procedures of unfired pressure vessels by the employer shall comply with the, Pressure Vessel Inspection Code API 510, Seventh Edition, March 1992, pages 1-27 or the National Board Inspection Code/American National Standard ANSI/NB-23, 1992 Edition, pages 1-217, which are hereby incorporated into these orders by reference.~~

(2) Repairs and alterations of pressure vessels performed in a state other than California shall be done by a company with a valid National Board 'R' stamp and inspected by an inspector holding a valid National Board Commission and Certificate of Competency (or equivalent) for the state in which the work is being performed. The repair or alteration shall conform to all the requirements of this section and be stamped in accordance with ANSI/NB-23-2004.

(3) Repairs.

(A) Repairs shall be performed by one of the following:

~~(A) 1. An organization in possession of a valid ASME Certificate of Authorization, or~~

~~(B) 2. An organization in possession of a valid National Board Certificate of Authorization.~~

~~(C) An organization having welding procedures and operators qualified in accordance with Section IX of the ASME Code.~~

~~(e) (B) The API 510-2003 Code shall not be used for the repair of boilers and pressure vessels as follows:~~

~~(1) 1. Boilers and fired pressure vessels as defined in the Boiler and Fired Pressure Vessel Safety Orders.~~

~~(2) 2. Vessels as defined in the Unfired Pressure Vessel Safety Orders, Section 460.~~

~~(3) 3. Vessels used in compressed air, LPG, CNG, LNG and NH3 services as defined in the Unfired Pressure Vessel Safety Orders.~~

~~(f) (C) The employer making the repair in accordance with API 510-2003 or the National Board Inspection Code/American National Standard ANSI/NB-23-2004, 1992 Edition shall provide for inspection, documentation and certification of the work and shall ensure prior authorization for the repair by a Qualified Inspector as defined in the Unfired Pressure Vessel Safety Orders, or an Authorized Inspector as defined in the American Petroleum Institute 510, Pressure Vessel Inspection Code, Seventh Edition, March, 1992, pages 1-27, which are hereby incorporated by reference.~~

~~(1) 1. Inspection and certification of repairs shall be made by an inspector regularly employed by one of the following:~~

~~(A) a. The Division;~~

~~(B) b. A City or County;~~

~~(C) c. The Authorized Inspection Agency of the organization making the alteration repair;~~

~~(D) d. The Authorized Inspection Agency which insures the boiler or pressure vessel; or,~~

~~(E) e. The owner/user inspection agency.~~

~~(g) (D) Fillet weld patches shall not be permitted unless acceptable to the Division.~~

Acceptance by the Division will be based on the materials, design and construction providing safety equivalent to the original code of construction.

(4) Alterations.

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~~(h)~~ (A) Alterations to pressure vessels shall be performed in compliance with ~~the National Board Inspection Code/American National Standard ANSI/NB-23, 1992-2004 Edition, pages 1-217, which is hereby incorporated by reference,~~ unless the material design and construction are accepted by the Division as equivalent to the ASME Code.

~~(1)~~ 1. No alteration to a pressure vessel shall be made until authorized by a Qualified Inspector as defined in the Unfired Pressure Vessel Safety Orders.

~~(2)~~ 2. Alterations shall be performed by one of the following:

~~(A)~~ a. An organization in possession of a valid ASME Certificate of Authorization, provided that the alteration is within the scope of such authorization, and provided that the organization's alteration program has been reviewed and accepted by the Division.

~~(B)~~ b. An organization in possession of a valid Certificate of Authorization issued by the National Board of Boiler and Pressure Vessel Inspectors to use the National Board "R" symbol stamp provided that the alteration is within the scope of such authorization, and provided that the organization's alteration program has been reviewed and accepted by the Division.

~~(C) An organization having welding procedures and welding operators qualified in accordance with Section IX of the ASME Code provided the organization's alteration program has been reviewed and accepted by the Division.~~

~~(3)~~ 3. For alterations performed at a field site, the scope of such authorization shall include field fabrication.

~~(4)~~ 4. The employer making the alteration shall provide for inspection, documentation and certification of the work and shall ensure prior authorization of the alteration by a Qualified Inspector holding a valid Certificate of Competency issued by the Division.

~~(5)~~ 5. Inspection and certification of alterations shall be made by a Qualified Inspector, employed by one of the following:

~~(A)~~ a. The Division;

~~(B)~~ b. A City or County;

~~(C)~~ c. The Authorized Inspection Agency of the organization making the alteration;

~~(D)~~ d. The Authorized Inspection Agency which insures the boiler or pressure vessel; or,

~~(E)~~ e. The owner/user inspection agency, provided the work was not performed by the Qualified Inspector's employer.

~~(6)~~ 6. A pressure test shall be applied after an alteration as required by the applicable ASME Code section. An alternate test or examination may be used subject to prior acceptance by the Division.

~~(i) The maximum allowable working pressure for each vessel shall be evaluated at intervals sufficiently frequent to give due consideration to corrosion and other factors causing deterioration.~~

~~(j) Pressure Relieving Devices.~~

~~(1) All pressure vessels shall be protected by a pressure relief device. Such relief devices shall have set pressures and shall prevent the pressures from rising above limits set by ASME Code. Pressure vessels which are connected together in a system with piping not containing valves that~~

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can isolate any pressure vessel while connected to its source or pressure may be considered as one unit.

~~(2) A vessel having a stop valve which can isolate the vessel from its pressure relieving device, as permitted in subsection (k), shall have an additional safety device. If the vessel may become entirely filled with liquid and if it is possible that pressure may be generated by continued input of heat through exchanger tubes or similar devices, or by exposure to sun or adjacent hot equipment. This additional safety device shall be connected to the vessel at all times except as permitted in subsection (k)(3). The additional safety device may be set at a pressure not greater than one and one quarter times the maximum allowable working pressure.~~

~~(k) Stop Valves Between Pressure Relieving Device and Vessel.~~

~~(1) A vessel in which pressure can be generated because of service conditions shall have no stop valve between the vessel and its pressure relieving device except for inspection or repair purposes, as permitted in subsection (k)(3), and except in cases where multiple pressure relieving devices are provided and the stop valves are so constructed that they can not be operated so as to reduce the pressure relieving capacity below that required.~~

~~(2) A vessel in which the pressure originates from an outside source exclusively may have its pressure relieving device on the vessel or at any point on the system between the vessel and its source of pressure, provided that the pressure relieving device is set to function at not over the maximum allowable working pressure of the vessel. Under these conditions there may be a stop valve between the vessel and the pressure relieving device which need not be locked open if the stop valve also closes the vessel from its source of pressure. Any stop valve between the pressure relieving device and the vessel which does not close the vessel from its source of pressure shall meet the requirements given in subsection (k)(1) above.~~

~~(3) Stop valves may be installed between a pressure relief device and the operating vessel for the purposes of inspection, repair and/or replacement of the pressure relief device. Where stop valves are installed, the employer shall develop, implement, and maintain a written plan containing all of the following:~~

~~(A) Procedures to ensure that stop valves are open and locked or sealed during normal operations and are not to be closed except by a qualified person(s).~~

~~NOTE: In the case of multiple relief device installations having spare capacity or spare relief valves, the stop valve can be closed on the inactive relief valves providing sufficient system relief capacity is maintained.~~

~~(B) Procedures to minimize the frequency of closing stop valves while the vessel is in service. Stop valves shall remain open and locked or sealed until a replacement pressure relief device is available for installation.~~

~~EXCEPTION: Stop valves may be closed for emergencies such as pressure relief device failure.~~

~~(C) Procedures to ensure that a replacement pressure relieving device or needed replacement parts are readily available prior to closing the stop valve and removing the pressure relief device. An index for the location of all stop valves subject to this section shall be maintained.~~

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~~(D) Before the removal of a pressure relief device from operating equipment, facility management shall review and approve a written operations plan for closing the stop valves. The plan shall incorporate, at a minimum, the following elements:~~

- ~~1. An engineering review to ensure that no increase in the capacity, pressure, severity, and/or operating condition of the unit or vessel will affect the safety of employees or equipment while the pressure relief device is out of service.~~
- ~~2. Provisions for written notification and operational procedures to unit controllers, operators and other affected personnel, including the safeguards and estimated time the valve will be out of service.~~
- ~~3. Identification of the functional position(s) or employees having knowledge of the operating equipment and pressure relieving device(s) authorized to approve closing a stop valve; and,~~
- ~~4. Identification of the qualified person(s) or functional position(s) authorized to actually close and then reopen a stop valve.~~

~~(E) A written overpressure relief plan for each safety relief device shall be developed prior to closing the stop valve. The plan shall include:~~

- ~~1. The means by which overpressure relief protection will be provided during the time that the pressure relief device is out of service;~~
- ~~2. The procedures to followed to minimize the time that the stop valve will be closed;~~
- ~~3. The operating conditions, limitations, and other safety measures which are required to be observed to protect employees and equipment; and,~~
- ~~4. In the event that the plan requires a standby person to manually operate a vent to the atmosphere, a replacement safety relief valve shall be available for installation prior to closing the valve. Employees shall be protected from hazards as identified by Article 10 of the General Industry Safety Orders.~~

~~(F) The written overpressure relief plan shall be made available to the Division upon request during the course of the work operation to which it applies.~~

~~(4) Valves as permitted above shall not be gate valves installed with the stems pointing above the horizontal plane of the valve body or globe valves installed so that the disk will open against pressure. This limitation need not apply to stop valves closing the vessel from its source of pressure. Other provisions acceptable to the Division may be used to assure that the valve is in the open position.~~

~~(l) Capacity of Pressure Relieving Devices.~~

~~(1) The aggregate capacity of the pressure relief devices applied to any pressure vessel or system shall be sufficient to carry off the maximum quantity of material that can be generated in, or supplied to, the attached equipment without permitting a rise in pressure within the vessel above the limits permitted by the ASME Code.~~

~~(2) Pressure relief devices designed to relieve hydrostatic pressure caused by heat as outlined under subsection (j)(2) shall have sufficient relieving capacity to prevent a hydrostatic pressure within the vessel in excess of 1.33 times the maximum allowable working pressure.~~

~~(m) Discharge lines from pressure relief devices shall be secured against movement. The lines shall be designed to facilitate drainage or shall be fitted with drains to prevent liquid entrapment~~

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~~in the discharge side of the relief device. The lines shall discharge at a location or manner to prevent injury to employees. The size of the discharge lines shall be such that any pressure that may exist or develop will not reduce the relieving capacity of the relief device below that required to properly protect the vessel. No valve shall be placed in a discharge line from a pressure relief device except when such discharge line discharges to a common header, in which case such valve shall be installed in compliance with subsection (k)(4) and locked or sealed open. Such valves may be closed only as allowed by subsection (k)(3).~~

~~(n) The employer shall maintain each pressure relief device installed on operating equipment so as to ensure the proper functioning of the device at the intended pressure. Such maintenance shall include inspection, testing, and the repair of the pressure relief device at frequencies as required by the service conditions.~~

~~(o) Pressure relief valve settings shall be changed only by authorized employees assigned such duties.~~

~~(p) A permanent and progressive record for each pressure vessel shall be maintained at the plant or the field office where the vessel is located. The record shall be available for inspection by the Division and shall include the following:~~

~~(1) The serial or identification number of the vessel.~~

~~(2) The established maximum allowable working pressure of the vessel.~~

~~(3) The coincident design temperature(s), and,~~

~~(4) Manufacturer's data reports, when obtainable, and any calculations used in establishing the maximum allowable working pressure.~~

~~(5) Such documents as necessary to record the results of tests, inspections, repairs, or alterations. Information on maintenance activities and events affecting the pressure vessel's integrity shall be included.~~

~~(q) Each pressure relief device in service shall have a serial or identification number stamped upon it and, in addition, a metal plate or tag shall be attached showing the pressure setting and the date the device was installed in service. A permanent and progressive record showing the serial or identification number, the location, the pressure setting, the date of installation in service, and the date of testing shall be maintained at the plant or field office where the pressure relieving device is located or at the supervising office.~~

~~NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.~~

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Amend Section 6552 to read:

§6552. Pressure-Relieving ~~Safety~~ Devices.

(a) All pressure vessels shall be protected by a pressure relief device. Such relief devices shall be set to prevent the pressure in the vessel from exceeding limits established by the ASME Code or, where permitted, the Unfired Pressure Vessel Safety Orders. Pressure vessels that are connected together in a system with piping not containing valves that can isolate any pressure vessel while connected to its source or pressure may be considered as one unit.

(b) A vessel having a stop valve that can isolate the vessel from its pressure-relieving device, as permitted in subsection (c), shall be protected by an additional safety device, if the vessel may become entirely filled with liquid, and if it is possible that pressure may be generated by continued input of heat through exchanger tubes or similar devices or by exposure to sun or adjacent hot equipment. This additional safety device shall be connected to the vessel at all times except as permitted in subsection (c)(3). The additional safety device may be set at a pressure not greater than one and one-quarter times the maximum allowable working pressure.

(c) Stop Valves Between Pressure-Relieving Device and Vessel.

(1) A vessel in which pressure can be generated because of service conditions shall have no stop valve between the vessel and its pressure-relieving device except for inspection or repair purposes, as permitted in subsection (c)(3), or except in cases where multiple pressure-relieving devices are provided and the stop valves are so constructed that they can not be operated so as to reduce the pressure-relieving capacity below that required.

(2) A vessel in which the pressure originates from an outside source exclusively may have its pressure-relieving device on the vessel or at any point on the system between the vessel and its source of pressure, provided that the pressure-relieving device is set to function at not over the maximum allowable working pressure of the vessel. Under these conditions there may be a stop valve between the vessel and the pressure-relieving device which need not be locked open if the stop valve also closes the vessel from its source of pressure. Any stop valve between the pressure-relieving device and the vessel which does not close the vessel from its source of pressure shall meet the requirements given in subsection (c)(1) above.

(3) Stop valves may be installed between a pressure relief device and the operating vessel for the purposes of inspection, repair and/or replacement of the pressure relief device. Where stop valves are installed, the employer shall develop, implement, and maintain a written plan containing all of the following:

(A) Procedures to ensure that stop valves are open and locked or sealed during normal operations and are not to be closed except by a qualified person(s).

NOTE: In the case of multiple relief device installations having spare capacity or spare relief valves, the stop valve can be closed on the inactive relief valves providing sufficient system relief capacity is maintained.

(B) Procedures to minimize the frequency of closing stop valves while the vessel is in service. Stop valves shall remain open and locked or sealed until a replacement pressure relief device is available for installation.

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EXCEPTION: Stop valves may be closed for emergencies such as pressure relief device failure.

(C) Procedures to ensure that a replacement pressure relieving device or needed replacement parts are readily available prior to closing the stop valve and removing the pressure relief device. An index for the location of all stop valves subject to this section shall be maintained.

(D) Before the removal of a pressure relief device from operating equipment, facility management shall review and approve a written operations plan for closing the stop valves. The plan shall incorporate, at a minimum, the following elements:

1. An engineering review to ensure that no increase in the capacity, pressure, severity, and/or operating condition of the unit or vessel will affect the safety of employees or equipment while the pressure relief device is out of service.

2. Provisions for written notification and operational procedures to unit controllers, operators and other affected personnel, including the safeguards and estimated time the valve will be out of service.

3. Identification of the functional position(s) or employees having knowledge of the operating equipment and pressure relieving device(s) authorized to approve closing a stop valve; and,

4. Identification of the qualified person(s) or functional position(s) authorized to actually close and then reopen a stop valve.

(E) A written overpressure relief plan for each safety relief device shall be developed prior to closing the stop valve. The plan shall include:

1. The means by which overpressure-relief protection will be provided during the time that the pressure relief device is out of service;

2. The procedures to be followed to minimize the time that the stop valve will be closed;

3. The operating conditions, limitations, and other safety measures which are required to be observed to protect employees and equipment; and,

4. In the event that the plan requires a standby person to manually operate a vent to the atmosphere, a replacement safety relief valve shall be available for installation prior to closing the valve. Employees shall be protected from hazards as identified by Article 10 of the General Industry Safety Orders.

(F) The written overpressure-relief plan shall be made available to the Division upon request during the course of the work operation to which it applies.

(4) Valves as permitted above shall not be gate valves installed with the stems pointing above the horizontal plane of the valve body or globe valves installed so that the disk will open against pressure. This limitation need not apply to stop valves closing the vessel from its source of pressure. Other provisions acceptable to the Division may be used to assure that the valve is in the open position.

(d) Capacity of Pressure-Relieving Devices.

(1) The aggregate capacity of the pressure relief devices applied to any pressure vessel or system shall be sufficient to carry off the maximum quantity of material that can be generated in, or supplied to, the attached equipment without permitting a rise in pressure within the vessel above the limits permitted by the ASME Code.

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(2) Pressure relief devices designed to relieve hydrostatic pressure caused by heat as outlined under subsection (b) shall have sufficient relieving capacity to prevent a hydrostatic pressure within the vessel in excess of 1.33 times the maximum allowable working pressure.

(e) Discharge lines from pressure relief devices shall be secured against movement. The lines shall be designed to facilitate drainage or shall be fitted with drains to prevent liquid entrapment in the discharge side of the relief device. The lines shall discharge at a location or in a manner to prevent injury to employees. The size of the discharge lines shall be such that any pressure that may exist or develop will not reduce the relieving capacity of the relief device below that required to properly protect the vessel. No valve shall be placed in a discharge line from a pressure relief device except when such discharge line discharges to a common header, in which case such valve shall be installed in compliance with subsection (c)(4) and locked or sealed open. Such valves may be closed only as allowed by subsection (c)(3).

(f) The employer shall maintain each pressure relief device installed on operating equipment so as to ensure the proper functioning of the device at the intended pressure. Such maintenance shall include inspection, testing, and the repair of the pressure relief device at frequencies as required by the service conditions.

(g) Pressure relief valve settings shall be changed only by authorized employees assigned such duties.

(h) A permanent and progressive record for each pressure vessel shall be maintained at the plant or the field office where the vessel is located. The record shall be available for inspection by the Division and shall include the following:

- (1) The serial or identification number of the vessel.
- (2) The established maximum allowable working pressure of the vessel.
- (3) The coincident design temperature(s),
- (4) Manufacturer's data reports, when obtainable, and any calculations used in establishing the maximum allowable working pressure.

(5) Such documents as necessary to record the results of tests, inspections, repairs, or alterations. Information on maintenance activities and events affecting the pressure vessel's integrity shall be included.

(i) Each pressure relief device in service shall have a serial or identification number stamped upon it and, in addition, a metal plate or tag shall be attached showing the pressure setting and the date the device was installed in service. A permanent and progressive record showing the serial or identification number, the location, the pressure setting, the date of installation in service, and the date of testing shall be maintained at the plant or field office where the pressure relieving device is located or at the supervising office.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

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Amend Section 6755 to read:

§6755. Definitions.

* * * * *

Owner-User. (Pressure Vessel) An owner or user of pressure vessels who maintains a regularly established inspection department whose organization and inspection procedures ~~are~~ have been acceptable to by the Division.

* * * * *

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

Amend Article 16 to read:

Article 16. Pumps, Pipe Lines, Fittings and Valves

Amend Section 6845 to read:

§6845. Piping, ~~and Fittings,~~ and Valves.

(a) The design, fabrication, and assembly, ~~test, and inspection~~ of piping systems installed prior to [_____ * _____], shall comply with Article 146 of the General Industry Safety Orders and ASME B31.3 1990, Chemical Plant and Petroleum Refinery Piping herein incorporated by reference. The design, fabrication, and assembly of piping systems installed on or after [_____ * _____], and the testing, inspection, and repair of all piping systems shall comply with Article 146 of the General Industry Safety Orders; API 570, Piping Inspection Code, Second Edition, October 1998, Addendum 3, August 2003; and ASME B31.3-2002, Process Piping; herein incorporated by reference.

(1) Excluded and optional piping systems specified in Section 1.2.2 of API 570-2003, are subject to inspection and testing by the employer in accordance with good engineering practices.

(b) Safe access shall be provided to all valves, or their remote controls, whenever it is necessary to operate them.

(c) Valves or their remote controls shall be provided with means of ready and safe access when required by the frequency of operation or the necessity of emergency operation. The valves included in this classification are:

(1) Valves manually operated as often as once a shift.

(2) Valves on fuel lines to a plant, unit, or internal combustion engine.

[* OAL to insert the effective date of the standard.]

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(3) Valves on lines, the emergency operation of which may be necessary for the safety of employees.

(d) Manually operated valves required for the emergency shutdown of units shall be maintained in good operating condition and provided with ready and safe access. Such valves shall plainly indicate whether they are open or closed.

(e) Quarter turn valves shall be provided with a means to indicate whether the valve is in the open or closed position.

(f) If a permanently attached handle is used on a quarter turn valve, it shall be installed or placed on the valve in such a position that the handle is at right angles to the line when in the closed position, and parallel with the line when in the open position. If compliance with the provisions of this subsection obstructs a passageway or walkway, the handle may be bent so as to provide clearance.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

Repeal Section 6846 as follows:

6846. Valves.

~~(a) Safe access shall be provided to all valves, or their remote controls, whenever it is necessary to operate them.~~

~~(b) Valves or their remote controls shall be provided with means of ready and safe access when required by the frequency of operation or the necessity of emergency operation. The valves included in this classification are:~~

~~(1) Valves manually operated as often as once a shift.~~

~~(2) Valves on fuel lines to a plant, unit, or internal combustion engine.~~

~~(3) Valves on lines, the emergency operation of which may be necessary for the safety of employees.~~

~~(d) Manually operated valves required for the emergency shutdown of units shall be maintained in good operating condition and provided with ready and safe access. Such valves shall plainly indicate whether they are open or closed.~~

~~(e) Quarter turn valves shall be provided with a means to indicate whether the valve is in the open or closed position.~~

~~(f) If a permanently attached handle is used on a quarter turn valve, it shall be installed or placed on the valve in such a position that the handle is at right angles to the line when in the closed position, and parallel with the line when in the open position. If compliance with the provisions of this subsection obstructs a passageway or walkway, the handle may be bent so as to provide clearance.~~

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Amend Section 6857 to read:

6857. Pressure Vessels, and Boilers and Pressure Relief Devices.

(a) All unfired pressure vessels, boilers, and fired pressure vessels shall meet all applicable requirements of the Unfired Pressure Vessel Safety Orders and the Boiler and Fired Pressure Vessel Safety Orders unless the design, material and construction of the pressure vessel or boiler is accepted by the Division as equivalent to the ASME Code.

~~(b) No pressure vessel shall be operated above its maximum allowable working pressure at coincident design temperature(s).~~ Maximum allowable working pressure.

~~(c)(1)~~ (1) The employer shall establish, or cause to be established, the maximum allowable working pressure of each boiler or pressure vessel in accordance with the rules of recognized pressure vessel codes applicable to the pressure vessel service involved.

(2) No pressure vessel shall be operated above its maximum allowable working pressure at coincident design temperature(s).

(3) The maximum allowable working pressure for each vessel shall be evaluated at intervals sufficiently frequent to give due consideration to corrosion and other factors causing deterioration. The original code of construction shall be used to establish the allowable stresses and joint efficiencies when re-rating, de-rating or calculating the pressure boundary minimum thickness of a vessel.

(c) Maintenance, inspection, and repair procedures.

(1) Maintenance, inspection, and repair procedures of unfired pressure vessels shall comply with API 510, Pressure Vessel Inspection Code, Eighth Edition, June 1997, Addendum 4, August 2003; API 580, Risk-based Inspection, Recommended Practice, First Edition, May 2002; API 579, Fitness-for-Service, Recommended Practice, First Edition, January 2000; or the National Board Inspection Code/American National Standard ANSI/NB-23, 2004 Edition; which are hereby incorporated by reference.

(2) A written risk-based inspection program, as described in API 510-2003 and API 580-2002, may be used to increase the internal or on-stream inspection limits required by API 510-2003 Section 6.4 to a maximum of 15 years, or the external inspection interval described by API 510-2003, Section 6.3 to a maximum of 10 years, provided it is reviewed and accepted by the Division before the program is implemented, and every three years thereafter. Any revisions made to the accepted risk-based inspection program must also be submitted, reviewed, and accepted by the Division.

(A) The risk-based inspection program shall not apply to pressure vessels and boilers that require "Permits to Operate" issued by the Division.

(B) The plan shall not apply to safety relief devices.

(C) The program shall indicate:

1. Acceptance by signature of plant management.
2. Involvement of plant operating, engineering, inspection, and maintenance personnel by signature.
3. The type of vessels covered.

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4. The methodology used to create the program.

5. A listing of the vessels covered by the program, with a clear indication of those vessels that have an inspection interval beyond the 10-year or half remaining life as required by API 510-2003 Section 6.4.

(3) A written fitness-for-service program, as described in API 510-2003 and API 579-2000, may be used to evaluate pressure vessels for continued service when found to have degradation that could affect their load carrying capability, provided it is reviewed and accepted by the Division before the program is implemented, and every three years thereafter. Any revisions made to the accepted fitness-for-service program must also be submitted, reviewed, and accepted by the Division.

(A) The program shall indicate:

1. Acceptance by signature of plant management.

2. The type of vessels covered.

3. How fitness-for-service results are documented. As a minimum, this documentation shall include acceptance of the fitness-for-service evaluation by signature of a technically competent company employee that is designated to review and accept the evaluation.

4. Involvement of plant operating, engineering, inspection, and maintenance personnel by signature.

5. The procedures in place for notifying the Division within the next business day of initiating a level 2 or 3 fitness-for-service evaluation as described in API 579-2000. Level 2 and 3 evaluations are subject to the acceptance of the Division. If the review is subsequent to returning the vessel to service, the Division may, in its reasonable discretion, require the unit be removed from service.

~~(4)~~ Repair and alterations.

(A) Repair and alteration of B boilers and P pressure V vessels shall meet all applicable requirements of the Unfired Pressure Vessel Safety Orders and the Boiler and Fired Pressure Vessel Safety Orders.

~~(1) Maintenance, inspection and repair procedures for unfired pressure vessels by the petroleum refining industry shall comply with the Pressure Vessel Inspection Code API 510, Seventh Edition, 1992, herein incorporated by reference, or the National Board Inspection Code/American National Standard ANSI/NB-23, 1992 Edition herein incorporated by reference.~~

(B) Repairs and alterations of pressure vessels performed in a state other than California shall be done by a company with a valid National Board 'R' stamp and inspected by an inspector holding a valid National Board Commission and Certificate of Competency (or equivalent) for the state in which the work is being performed. The repair or alteration shall conform to all the requirements of this section and be stamped in accordance with ANSI/NB-23-2004.

(C) Repairs.

1. Repairs shall be performed by one of the following:

~~(A)~~ a. An organization in possession of a valid ASME Certificate of Authorization;

~~(B)~~ b. An organization in possession of a valid National Board Certificate of Authorization;

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~~(C) An organization having welding procedures and operators qualified in accordance with Section IX of the ASME Code.~~

~~(e)-2.~~ The API 510-2003 Code shall not be used for the repair of boilers and pressure vessels as follows:

~~(1) a.~~ Boilers and fired pressure vessels as defined in the Boiler and Fired Pressure Vessel Safety Orders;

~~(2) b.~~ Vessels as defined in the Unfired Pressure Vessel Safety Orders, Section 460, ~~which are not used by the petroleum refining industry;~~

~~(3) c.~~ Vessels used in compressed air, LPG, CNG, LNG, and NH₃ services as defined in the ~~Boiler and Fired~~ Unfired Pressure Vessel Safety Orders.

~~(f) 3.~~ The employer making the repair in accordance with API 510-2003 or ~~the National Board Inspection Code ANSI/NB-23, 2004 herein hereby incorporated by reference,~~ shall provide for inspection, documentation and certification of the work and shall ensure prior authorization for the repair by a Qualified Inspector as defined in the Unfired Pressure Vessel Safety Orders, ~~or an Authorized Inspector as defined in the Pressure Vessel Inspection Code API 510.~~

~~(1) 4.~~ Inspection and certification of repairs shall be made by an inspector, regularly employed by one of the following:

~~(A) a.~~ The Division;

~~(B) b.~~ A City or County;

~~(C) c.~~ The Authorized Inspection Agency of the organization making the repair;

~~(D) d.~~ The Authorized Inspection Agency which insures the boiler or pressure vessel; or,

~~(E) e.~~ The owner/user inspection Agency.

~~(g) 5.~~ Fillet weld patches shall not be permitted unless acceptable to the Division. Acceptance by the Division will be based on the materials, design and construction providing safety equivalent to the original code of construction.

(D) Alterations.

~~(1) 1.~~ Alterations to pressure vessels shall be performed in compliance with ~~the National Board Inspection Code/American National Standard ANSI/NB-23, 1992-2004, Edition~~ unless the material design and construction are accepted by the Division as equivalent to the ASME Code.

~~(1) 2.~~ No alteration to a pressure vessel shall be made until authorized by a Qualified Inspector as defined in the Unfired Pressure Vessel Safety Orders.

~~(2) 3.~~ Alterations shall be performed by one of the following:

~~(A) a.~~ An organization in possession of a valid ASME Certificate of Authorization, provided that the alteration is within the scope of such authorization, and provided that the organization's alteration program has been reviewed and accepted by the Division.

~~(B) b.~~ An organization in possession of a valid Certificate of Authorization issued by the National Board of Boiler and Pressure Vessel Inspectors to use the National Board "R" symbol stamp provided that the alteration is within the scope of such authorization, and provided that the organization's alteration program has been reviewed and accepted by the Division.

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~~(C) An organization having welding procedures and welding operators qualified in accordance with Section IX of the ASME Code, provided that the organization's alteration program has been reviewed and accepted by the Division.~~

~~(3) 4.~~ For alterations performed at a field site, the scope of such authorization shall include field fabrication.

~~(4) 5.~~ The employer making the alteration shall provide for inspection, documentation, and certification of the work and shall ensure prior authorization of the alteration by a Qualified Inspector holding a valid Certificate of Competency issued by the Division.

~~(5) 6.~~ Inspection and certification of alterations shall be made by a Qualified Inspector, employed by one of the following:

~~(A) a.~~ The Division;

~~(B) b.~~ The Authorized Inspection Agency of the organization making the alteration;

~~(D) c.~~ The Authorized Inspection Agency which insures the boiler or pressure vessel; or

~~(E) d.~~ The owner/user inspection agency, provided the work was not performed by the Qualified Inspector's employer.

~~(6) 7.~~ A pressure test shall be applied after an alteration as required by the applicable ASME Code section. An alternative test or examination may be used subject to prior acceptance by the Division.

~~(i) The maximum allowable working pressure for each vessel shall be evaluated at intervals sufficiently frequent to give due consideration to corrosion and other factors causing deterioration.~~

~~(j) Pressure-Relieving Devices.~~

~~(1) All pressure vessels shall be protected by a pressure relief device. Such relief devices shall be set to prevent the pressure in the vessel from exceeding limits established by the ASME Code or, where permitted the Pressure Vessel Safety Orders, and shall prevent the pressures from rising above limits set by ASME Code. Pressure vessels which are connected together in a system with piping not containing valves which can isolate any pressure vessel while connected to its source of pressure may be considered as one unit.~~

~~(2) A vessel having a stop valve that shuts off the vessel from its pressure relieving device, as permitted in subsection (k), shall be protected by an additional safety device, if the vessel may become entirely filled with liquid and if it is possible that pressure may be generated by continued input of heat through exchanger tubes or similar devices, or by exposure to sun or adjacent hot equipment. This additional safety device shall be connected to the vessel at all times except as permitted in subsection (k)(3). The additional safety device may be set at a pressure not greater than one and one-quarter times the maximum allowable working pressure.~~

~~(k) Stop Valves Between Pressure-Relieving Device and Vessel.~~

~~(1) A vessel in which pressure can be generated because of service conditions shall have no stop valve between the vessel and its pressure relieving device except for inspection or repair purposes, as permitted in subsection (k)(3) or except in cases where multiple pressure relieving devices are provided and the stop valves are so constructed that they can not be operated so as to reduce the pressure-relieving capacity below that required.~~

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~~(2) A vessel in which the pressure originates from an outside source exclusively may have its pressure-relieving device on the vessel or at any point on the system between the vessel and its source of pressure, provided that the pressure-relieving device is set to function at not over the maximum allowable working pressure of the vessel. Under these conditions there may be a stop valve between the vessel and the pressure-relieving device which need not be locked open if the stop valve also closes the vessel from its source of pressure. Any stop valve between the pressure-relieving device and the vessel, which does not close the vessel from its source of pressure, shall meet the requirements given in subsection (k)(1) above.~~

~~(3) Stop valves may be installed between a pressure relief device and the operating vessel for the purposes of inspection, repair, and/or replacement of the pressure relief device. Where stop valves are installed, the employer shall develop, implement, and maintain a written plan containing all of the following:~~

~~(A) Procedures to ensure that stop valves are open and locked or sealed during normal operations and are not to be closed except by a qualified person(s).~~

~~NOTE: In the case of multiple relief device installations having spare capacity or spare relief valves, the stop valve can be closed on the inactive relief valves providing sufficient system relief capacity is maintained.~~

~~(B) Procedures to minimize the frequency of closing stop valves while the vessel is in service. Except for emergencies stop valves shall remain open and locked or sealed until a replacement pressure relief device is available for installation.~~

~~(C) Procedures to ensure that a replacement pressure relieving device or needed replacement parts are available prior to closing the stop valve and removing the pressure relief device. An index for the location of all stop valves subject to this section shall be maintained.~~

~~(D) Before the removal of a pressure relief device from operating equipment, facility management shall review and approve a written operations plan for closing the stop valves. The plan shall incorporate at a minimum, the following elements:~~

~~1. an engineering review to ensure that no increase in the capacity, pressure, severity, and/or operating condition of the unit or vessel will affect the safety of employees or equipment while the pressure relief device is out of service;~~

~~2. provisions for written notification and operational procedures to unit controllers, operators and other appropriate personnel, including the safeguards and estimated time the valve will be out of service;~~

~~3. identification of the functional position(s) or employees having knowledge of the operating equipment and pressure relieving device(s) authorized to approve closing a stop valve; and,~~

~~4. identification of the qualified person(s) or functional position(s) authorized to actually close and then reopen a stop valve.~~

~~(E) A written overpressure relief plan for each safety relief device before closing the stop valve. This plan shall include:~~

~~1. the means by which overpressure relief protection will be provided during the time that the pressure relief device is out of service;~~

~~2. the procedures to be followed to minimize the time that the stop valve will be closed;~~

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~~3. the operating conditions, limitations, and other safety measures which are required to be observed to protect employees and equipment; and;~~

~~4. in the event that the plan requires a standby person to manually operate a vent to the atmosphere, a replacement safety relief valve shall be available for installation prior to closing the stop valve. Employees shall be protected from hazards as identified by Article 10 of the General Industry Safety Orders.~~

~~(F) The written overpressure relief plan shall be made available to the Division upon request during the course of the work operation to which it applies.~~

~~(4) Valves as permitted above shall not be gate valves installed with the stems pointing above the horizontal plane of the valve body or globe valves installed so that the disk will open against the pressure. This limitation need not apply to valves closing the vessel from its source of pressure. Other provisions acceptable to the Division may be used to assure that the valve is in the open position.~~

~~(l) Capacity of Pressure Relieving Devices.~~

~~(1) The aggregate capacity of the pressure relief devices applied to any pressure vessel or system shall be sufficient to carry off the maximum quantity of material that can be generated in, or supplied to, the attached equipment without permitting a rise in pressure within the vessel above the limits permitted by the ASME Code.~~

~~(2) Pressure relief devices designed to relieve hydrostatic pressure caused by heat as outlined under subsection (j)(2) shall have sufficient relieving capacity to prevent a hydrostatic pressure within the vessel to excess of 1.33 times the maximum allowable working pressure.~~

~~(m) Discharge lines from pressure relief devices shall be secured against movement. The lines shall be designed to facilitate drainage or shall be fitted with drains to prevent liquid entrapment in the discharge side of the relief device. The lines shall discharge at a location or in a manner to prevent injury to employees. The size of discharge lines shall be such that any pressure that may exist or develop will not reduce the relieving capacity of the relief device below that required to properly protect the vessel. No valve shall be placed in a discharge line from a pressure relief device except when such discharge line discharges to a common header, in which case such valve shall be installed in compliance with subsection (k)(4) and locked or sealed open. Such valves may be closed only as allowed by subsection (k)(3).~~

~~(n) The employer shall maintain each pressure relief device installed on operating equipment so as to ensure the proper functioning of the device at the intended pressure. Such maintenance shall include inspection, testing, and the repair of the pressure relief device at frequencies as required by the service conditions.~~

~~(o) Pressure relief valve settings shall be changed only by authorized employees assigned such duties.~~

~~(p) A permanent and progressive record for each pressure vessel shall be maintained at the plant or the field office where the vessel is located. The record shall be available for inspection by the Division and shall include the following:~~

~~(1) The serial or identification number of the vessel.~~

~~(2) The established maximum allowable working pressure of the vessel.~~

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~~(3) The coincident design temperature(s).~~

~~(4) Manufacturer's data reports, when obtainable, and any calculations used in establishing the maximum allowable working pressure.~~

~~(5) Such documents as necessary to record the results of the tests, inspections, repairs or alterations. Information on maintenance activities and events affecting the pressure vessel's integrity shall be included.~~

~~(a) Each pressure relief device in service shall have a serial or identification number stamped upon it and in addition a metal plate or tag shall be attached showing the pressure setting and the date the device was installed in service. A permanent and progressive record showing the serial or identification number, the location, the pressure setting, the date of installation in service and the date of testing shall be maintained at the plant or field office where the pressure relieving device is located or at the supervising office.~~

~~NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.~~

Add new Section 6858 to Article 18 to read:

§6858. Pressure-Relieving Devices.

(a) All pressure vessels shall be protected by a pressure relief device. Such relief devices shall be set to prevent the pressure in the vessel from exceeding limits established by the ASME Code or, where permitted, the Unfired Pressure Vessel Safety Orders. Pressure vessels that are connected together in a system with piping not containing valves that can isolate any pressure vessel while connected to its source or pressure may be considered as one unit.

(b) A vessel having a stop valve that can isolate the vessel from its pressure-relieving device, as permitted in subsection (c), shall be protected by an additional safety device, if the vessel may become entirely filled with liquid, and if it is possible that pressure may be generated by continued input of heat through exchanger tubes or similar devices or by exposure to sun or adjacent hot equipment. This additional safety device shall be connected to the vessel at all times except as permitted in subsection (c)(3). The additional safety device may be set at a pressure not greater than one and one-quarter times the maximum allowable working pressure.

(c) Stop Valves Between Pressure-Relieving Device and Vessel.

(1) A vessel in which pressure can be generated because of service conditions shall have no stop valve between the vessel and its pressure-relieving device except for inspection or repair purposes, as permitted in subsection (c)(3), or except in cases where multiple pressure-relieving devices are provided and the stop valves are so constructed that they can not be operated so as to reduce the pressure-relieving capacity below that required.

(2) A vessel in which the pressure originates from an outside source exclusively may have its pressure-relieving device on the vessel or at any point on the system between the vessel and its source of pressure, provided that the pressure-relieving device is set to function at not over the maximum allowable working pressure of the vessel. Under these conditions there may be a stop valve between the vessel and the pressure-relieving device which need not be locked open if the stop valve also closes the vessel from its source of pressure. Any stop valve between the

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pressure-relieving device and the vessel which does not close the vessel from its source of pressure shall meet the requirements given in subsection (c)(1) above.

(3) Stop valves may be installed between a pressure relief device and the operating vessel for the purposes of inspection, repair and/or replacement of the pressure relief device. Where stop valves are installed, the employer shall develop, implement, and maintain a written plan containing all of the following:

(A) Procedures to ensure that stop valves are open and locked or sealed during normal operations and are not to be closed except by a qualified person(s).

NOTE: In the case of multiple relief device installations having spare capacity or spare relief valves, the stop valve can be closed on the inactive relief valves providing sufficient system relief capacity is maintained.

(B) Procedures to minimize the frequency of closing stop valves while the vessel is in service. Stop valves shall remain open and locked or sealed until a replacement pressure relief device is available for installation.

EXCEPTION: Stop valves may be closed for emergencies such as pressure relief device failure.

(C) Procedures to ensure that a replacement pressure relieving device or needed replacement parts are readily available prior to closing the stop valve and removing the pressure relief device. An index for the location of all stop valves subject to this section shall be maintained.

(D) Before the removal of a pressure relief device from operating equipment, facility management shall review and approve a written operations plan for closing the stop valves. The plan shall incorporate, at a minimum, the following elements:

1. An engineering review to ensure that no increase in the capacity, pressure, severity, and/or operating condition of the unit or vessel will affect the safety of employees or equipment while the pressure relief device is out of service;

2. Provisions for written notification and operational procedures to unit controllers, operators and other affected personnel, including the safeguards and estimated time the valve will be out of service;

3. Identification of the functional position(s) or employees having knowledge of the operating equipment and pressure-relieving device(s) authorized to approve closing a stop valve; and,

4. Identification of the qualified person(s) or functional position(s) authorized to actually close and then reopen a stop valve.

(E) A written overpressure relief plan for each safety relief device shall be developed prior to closing the stop valve. The plan shall include:

1. The means by which overpressure-relief protection will be provided during the time that the pressure relief device is out of service;

2. The procedures to be followed to minimize the time that the stop valve will be closed;

3. The operating conditions, limitations, and other safety measures which are required to be observed to protect employees and equipment; and,

4. In the event that the plan requires a standby person to manually operate a vent to the atmosphere, a replacement safety relief valve shall be available for installation prior to closing

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the valve. Employees shall be protected from hazards as identified by Article 10 of the General Industry Safety Orders.

(F) The written overpressure-relief plan shall be made available to the Division upon request during the course of the work operation to which it applies.

(4) Valves as permitted above shall not be gate valves installed with the stems pointing above the horizontal plane of the valve body or globe valves installed so that the disk will open against pressure. This limitation need not apply to stop valves closing the vessel from its source of pressure. Other provisions acceptable to the Division may be used to assure that the valve is in the open position.

(d) Capacity of Pressure-Relieving Devices.

(1) The aggregate capacity of the pressure relief devices applied to any pressure vessel or system shall be sufficient to carry off the maximum quantity of material that can be generated in, or supplied to, the attached equipment without permitting a rise in pressure within the vessel above the limits permitted by the ASME Code.

(2) Pressure relief devices designed to relieve hydrostatic pressure caused by heat as outlined under subsection (b) shall have sufficient relieving capacity to prevent a hydrostatic pressure within the vessel in excess of 1.33 times the maximum allowable working pressure.

(e) Discharge lines from pressure relief devices shall be secured against movement. The lines shall be designed to facilitate drainage or shall be fitted with drains to prevent liquid entrapment in the discharge side of the relief device. The lines shall discharge at a location or in a manner to prevent injury to employees. The size of the discharge lines shall be such that any pressure that may exist or develop will not reduce the relieving capacity of the relief device below that required to properly protect the vessel. No valve shall be placed in a discharge line from a pressure relief device except when such discharge line discharges to a common header, in which case such valve shall be installed in compliance with subsection (c)(4) and locked or sealed open. Such valves may be closed only as allowed by subsection (c)(3).

(f) The employer shall maintain each pressure relief device installed on operating equipment so as to ensure the proper functioning of the device at the intended pressure. Such maintenance shall include inspection, testing, and the repair of the pressure relief device at frequencies as required by the service conditions.

(g) Pressure relief valve settings shall be changed only by authorized employees assigned such duties.

(h) A permanent and progressive record for each pressure vessel shall be maintained at the plant or the field office where the vessel is located. The record shall be available for inspection by the Division and shall include the following:

(1) The serial or identification number of the vessel.

(2) The established maximum allowable working pressure of the vessel.

(3) The coincident design temperature(s).

(4) Manufacturer's data reports, when obtainable, and any calculations used in establishing the maximum allowable working pressure.

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(5) Such documents as necessary to record the results of tests, inspections, repairs, or alterations. Information on maintenance activities and events affecting the pressure vessel's integrity shall be included.

(i) Each pressure relief device in service shall have a serial or identification number stamped upon it and, in addition, a metal plate or tag shall be attached showing the pressure setting and the date the device was installed in service. A permanent and progressive record showing the serial or identification number, the location, the pressure setting, the date of installation in service, and the date of testing shall be maintained at the plant or field office where the pressure relieving device is located or at the supervising office.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.