

BAY AREA AIR QUALITY MANAGEMENT DISTRICT

**REGULATION 8 RULE 28 – ORGANIC COMPOUNDS; EPISODIC RELEASES
FROM PRESSURE RELIEF DEVICES AT
PETROLEUM REFINERIES AND CHEMICAL
PLANTS**

*(Adopted: July 16, 1980)(Amended: February 18, 1981; March 17, 1982; July 20, 1983;
September 6, 1989; June 1, 1994; December 17, 1997; March 18, 1998; December 21,
2005)*

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**REGULATION 8
ORGANIC COMPOUNDS
RULE 28
EPISODIC RELEASES FROM PRESSURE RELIEF DEVICES AT
PETROLEUM REFINERIES AND CHEMICAL PLANTS**

(Adopted July 16, 1980)

8-28-100 GENERAL

8-28-101 Description: The purpose of this Rule is to prevent the episodic emissions of organic compounds from pressure relief devices on equipment handling gaseous organic compounds at petroleum refineries, and to collect information on episodic organic and inorganic compound emissions from pressure relief devices at petroleum refineries and chemical plants.

(Amended 3/17/82; 7/20/83; 12/17/97; 12/21/05)

8-28-110 Deleted September 6, 1989

8-28-111 Exemption, Evaporation Point: The provisions of this rule shall not apply to pressure relief devices that exclusively handle organic compounds exhibiting a 10% evaporation point greater than 150 degrees Celsius (302 degrees Fahrenheit) when using ASTM D-86 and/or inorganic compounds not listed in Section 8-28-401.5.

(Amended 9/6/89; 12/17/97; 3/18/98; 12/21/05)

8-28-112 Exemption, Storage Tanks: The requirements of this rule shall not apply to any pressure relief devices on storage tanks.

(Amended December 17, 1997)

8-28-113 Exemptions, Research and Development Facilities: The provisions of this Rule shall not apply to research or development facilities that produce only non-commercial products for research and development purposes.

(Adopted 6/1/94; Amended 12/21/05)

8-28-114 Limited Exemption, Small Refineries: Section 8-28-304.2 shall not apply to petroleum refineries processing less than 20,000 barrels per stream day of crude, unless the District's evaluation of the Process Hazards Analysis in Section 8-28-304.1 determines that it is cost-effective and technologically feasible for the refinery to control the pressure relief devices.

(Adopted 12/17/97; Amended 12/21/05)

8-28-115 Exemption, Thermal Relief Valves: The provisions of this rule shall not apply to thermal relief valves that are vented to process drains or back to the pipeline.

(Renumbered December 21, 2005)

8-28-200 DEFINITIONS

8-28-201 Chemical Plant: Any facility engaged in producing organic or inorganic chemicals and/or manufacturing products by chemical processes. Any facility or operation that has 325 as the first three digits in the North American Industrial Classification Standard (NAICS) Code. Chemical plants may include, but are not limited to the manufacture of: industrial inorganic and organic chemicals; plastic and synthetic resins, synthetic rubber, synthetic and other man-made fibers; drugs; soap, detergents and cleaning preparations, perfumes, cosmetics and other toilet preparations; paints, varnishes, lacquers, enamels and allied products; agricultural chemicals; safflower and sunflower oil extracts; and re-refining, not including petroleum refineries.

(Adopted 7/20/83; Amended 12/17/97; 12/21/05)

8-28-202 Pressure Relief Valve: The automatic pressure-relieving device actuated by the static pressure upstream of the valve.

(Renumbered July 20, 1983)

8-28-203 Rupture Disk: The thin metal diaphragm held between flanges.

(Renumbered July 20, 1983)

8-28-204 Deleted December 17, 1997

8-28-205 Deleted December 17, 1997

8-28-206 Deleted December 17, 1997

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- 8-28-207 Modified Source:** The same definition contained in District Regulation 2, Rule 1.
(Adopted 12/17/97; Amended 12/21/05)
- 8-28-208 Parallel Service:** Additional pressure relief devices which protect a common piece or pieces of equipment. These additional pressure relief devices may be installed as spares to facilitate maintenance or because the design relieving capacity cannot be obtained with a single pressure relieving device. The pressure relieving devices do not need to have the same pressure setting to be considered parallel.
(Adopted December 17, 1997)
- 8-28-209 Petroleum Refinery:** Any facility that processes petroleum as defined in the North American Industrial Classification Standard No. 32411 (1997).
(Adopted 12/21/97; Amended 12/21/05)
- 8-28-210 Pressure Relief Device:** The automatic pressure-relieving device for discharges of material that prevents safety hazards, prevents pressures from exceeding the maximum allowable working pressure of the operating process equipment, or prevents equipment damage. Such devices include, but are not limited to, pressure relief valves, emergency de-pressuring vents and rupture disks.
(Adopted 12/17/97; Amended 12/21/05)
- 8-28-211 Prevention Measure:** A reliable component, system, or program that will prevent releases from pressure relief devices. Examples of prevention measures include, but are not limited to: (1) flow, temperature, level and pressure indicators with interlocks, deadman switches, monitors, or automatic actuators, (2) documented and verified routine inspection and maintenance programs, (3) inherently safer designs, (4) deluge systems. Operator training and documented and verified routine inspection and maintenance programs may count as only one of the 3 Prevention Measures required by Section 8-28-304.1 and 405. A component, system or program with a high probability for failure shall not be considered a Prevention Measure.
(Adopted 12/17/97; Amended 12/21/05)
- 8-28-212 Process Hazards Analysis (PHA):** An organized effort to identify and analyze the significance of hazardous scenarios associated with a process or activity. For the purposes of this rule, PHA's are used to pinpoint weaknesses in the design and operation of facilities that could lead to releases from pressure relief devices and to provide the facility with information to aid in making decisions for preventing such releases.
(Adopted 12/17/97; Amended 12/21/05)
- 8-28-213 Qualified Person:** An APCO-approved person who is qualified to attest to the validity of the Process Safety Requirements and who is a registered professional engineer in the State of California with expertise in chemical, mechanical or safety engineering.
(Adopted 12/17/97; Amended 12/21/05)
- 8-28-214 Release Event:** Any release of organic or inorganic pollutants greater than 10 pounds from a pressure relief device, subject to this Rule, to the atmosphere. These events do not include releases that are vented to a vapor recovery or disposal system with at least 95% by weight organic compound control efficiency.
(Adopted 12/17/97; Amended 12/21/05)
- 8-28-215 Responsible Manager:** A person who is an employee of the facility or business entity that owns or operates the facility who possesses sufficient authority to ensure the implementation of Process Safety Requirements.
(Adopted 12/17/97; Amended 12/21/05)
- 8-28-216 Tell-tale Indicator:** A physical non-electronic device installed on a pressure relief device that can visually indicate whether or not that pressure relief device has had a release. Tell-tale indicators include, but are not limited to, socks, rupture disks, and flags.
(Adopted December 21, 2005)

8-28-300 STANDARDS

8-28-301 Deleted December 17, 1997

8-28-302 Pressure Relief Devices at New or Modified Sources at Petroleum Refineries: Any person installing a new refinery source or modifying an existing refinery source, that is equipped with at least one pressure relief device in organic compound service,

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shall meet all applicable requirements of Regulation 2, Rule 2, including Best Available Control Technology.

(Adopted 12/17/97; Amended 12/21/05)

8-28-303 Existing Pressure Relief Devices at Petroleum Refineries: Use of a pressure relief device in organic compound service on any equipment at a Petroleum Refinery is prohibited, except when the device meets at least one of the following conditions:

- 303.1 The pressure relief device is vented to a vapor recovery or disposal system with at least a 95 percent by weight organic compounds control efficiency, and the control system is properly sized per manufacturer's recommendations to handle the material from all devices it is intended to serve, or
- 303.2 The facility has implemented the Process Safety Requirements specified in Section 8-28-405 for the pressure relief device.

(Adopted 12/17/97; Amended 3/18/98; 12/21/05)

8-28-304 Repeat Release – Pressure Relief Devices at Petroleum Refineries: After the next scheduled turnaround following July 1, 1998, any petroleum refinery source that has at least one reportable Release Event from a pressure relief device in organic compound service,—including those in parallel service, in any consecutive five calendar year period shall meet the following conditions:

- 304.1 Within 90 days of the first Release Event from a pressure relief device, the facility shall conduct and submit to the APCO an additional, separate Process Hazard Analysis and meet the Prevention Measures Procedures specified in Section 8-28-405; and conduct a failure analysis of the incident, to prevent recurrence of similar incidents. Within 120 days of the first Release Event, the facility shall equip each pressure relief device of that source with a tamperproof tell-tale indicator that will show that a release has occurred since the last inspection. The Process Hazards Analysis shall include an evaluation of the cost-effectiveness and technical feasibility of control devices to remedy the incident. This evaluation of control devices shall include, but shall not be limited to, the following: (1) installing additional flare gas compressor recovery capacity and (2) venting the pressure relief device that causes the Release Event to existing vapor recovery or disposal systems, and
- 304.2 Within one year of the second Release Event from a pressure relief device in organic compound service on the same source, including those in parallel service, the facility shall vent all the pressure relief devices that vent the second Release Event, including those in parallel service, to a vapor recovery or disposal system with at least 95 percent by weight organic compounds control efficiency, and the control system shall be properly sized per manufacturer's recommendations to handle the material from all devices it is intended to serve.

The five calendar year period of this section shall begin at the time that the District receives a Prevention Measure Plan as specified in Section 8-28-304.1.

(Adopted 12/17/97; Amended 3/18/98; 12/21/05)

8-28-400 ADMINISTRATIVE REQUIREMENTS

8-28-401 Reporting at Petroleum Refineries and Chemical Plants: Any indication of a Release Event at a petroleum refinery or chemical plant shall be reported to the APCO no later than the next working day following the venting. In addition, the following information shall be submitted in writing to the APCO within 30 days following the Release Event:

- 401.1 Date, time, and duration of the Release Event in minutes.
- 401.2 The pressure relief device involved, identified by its unique number as required in Section 8-28-404 as well as its name and service commonly referred to by the facility.
- 401.3 The incident number assigned by the APCO for the Release Event.
- 401.4 Type and size of device.

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- 401.5 Type and amount of material released in pounds, accurate to two significant digits. Reportable materials are: total organic compounds, ammonia, hydrogen sulfide, chlorine, sulfur dioxide, sulfur trioxide, hydrofluoric acid, and difluoroethane.
- 401.6 Information and assumptions used to report the duration and amount released during the event.
- 401.7 Cause of the event.
- 401.8 A schedule for action to prevent re-occurrence of the event.
- 401.9 Results of fugitive emission inspection of the device done in accordance with the requirements of section 8-28-402.2.

(Amended 2/18/81; 12/17/97; 3/18/98; 12/21/05)

8-28-402 Inspection: Any person subject to this Rule shall comply with the following inspection requirements:

- 402.1 Any pressure relief device subject to this Rule that is equipped with a telltale indicator shall be inspected at least once per day to determine if a release has been indicated, unless and until the pressure relief device has been equipped with a monitoring system pursuant to Section 8-28-503 and the facility has submitted a monitoring system demonstration report pursuant to Section 8-28-406.
- 402.2 Any pressure relief device in organic compound service that has a Release Event and is subject to this Rule shall be inspected within 5 working days after the release to confirm compliance with Regulation 8, Rule 18 and the results reported in accordance with Regulation 8-28-401.9.

(Amended 9/6/89; 6/1/94; 12/17/97; 12/21/05)

8-28-403 Deleted December 21, 2005

8-28-404 Identification: Any pressure relief device subject to this rule shall be identified with a unique permanent identification code approved by the APCO. This identification code shall be used to refer to the pressure relief device location. Records and reports for each pressure relief device shall refer to this identification code.

(Adopted 6/1/94; Amended 12/17/97; 12/21/05)

8-28-405 Process Safety Requirements: All facilities using pressure relief devices in organic compound service that are subject to the standards in Section 8-28-300 that have a potential for a Release Event shall comply with the following process safety requirements:

- 405.1 Explicitly establish training, equipment, inspection, maintenance and monitoring requirements such that the pressure relief device releases are minimized;
- 405.2 Using a Process Hazards Analysis, implement at least 3 redundant Prevention Measures before a release. Until July 1, 2007, as an alternative method of complying with this Section 8-28-405.2, a facility may operate a pressure relief device with only one or two Prevention Measures in place, but if such a device experiences a Release Event then the facility shall vent all devices on the source served by the device to a vapor recovery or disposal system with at least 95% by weight organic compound control efficiency. By July 1, 2007, all atmospheric pressure relief devices must be equipped with at least three redundant Prevention Measures;
- 405.3 The Process Safety Requirements must be approved and signed by a Qualified Person and a Responsible Manager; and
- 405.4 The Process Safety Requirements must be submitted for review to the APCO to determine if the plan meets the requirements of subsections 8-28-405.1 through 405.3. The APCO shall provide a 30-day public comment period and will consider all comments received during this period prior to approval or disapproval of the procedures.

(Adopted 12/17/97; Amended 3/18/98; 12/21/05)

8-28-406 Monitoring System Demonstration Report: No later than June 1, 2007, each facility shall submit to the APCO a Monitoring System Demonstration Report that demonstrates that each pressure relief device subject to this Rule that has the potential to release to the atmosphere is monitored by a monitoring system that satisfies the requirements of Section 8-28-503. The Monitoring System Demonstration Report shall include the following elements:

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- 406.1 A listing of each pressure relief device covered by the report, including the nominal set pressure for each device and the range of pressures over which each device could reasonably be expected to release;
- 406.2 A description of the monitoring system for each pressure relief device covered by the Report, including a narrative description and diagrams or charts, that clearly identifies all elements of the system and how they operate to monitor releases as required under Section 8-28-503;
- 406.3 A listing of all operating parameters that are directly monitored by the system (e.g. temperature, pressure, flowrates, etc.) with a description of (i) the sensitivity and accuracy of the device(s) monitoring each parameter and the frequency with which each parameter is monitored, and (ii) how the sensitivity and frequency of monitoring is sufficient to allow the Monitoring system to detect releases of 10 pounds;
- 406.4 A listing of any calculations that are used to derive Release Event emissions information from data on operating parameters, including any assumptions on which such calculations are based and the basis for those assumptions;
- 406.5 A description of the alarms or other indication that the system provides to alert operators that a Release Event has or may have occurred; and
- 406.6 A description of how the information obtained by the monitoring system is recorded and maintained;

(Adopted December 21, 2005)

8-28-407 Process Unit Identification Report: No later than March 1, 2006, each petroleum refinery shall submit to the APCO a report listing all process units equipped with atmospheric PRDs, a listing of all associated pressure relief devices subject to this Rule identified in accordance with Section 8-28-404, and the date of the first turnaround following July 1, 1998, for each of the process units.

(Adopted December 21, 2005)

8-28-500 MONITORING AND RECORDS

8-28-501 Deleted December 17, 1997

8-28-502 Records: Any person subject to this Rule shall maintain the following records for a period of no less than two years and make them available to the APCO upon request:

- 502.1 Prevention measure records to demonstrate compliance with the standards in Sections 8-28-303 and 8-28-405;
- 502.2 Records of all of the pressure relief devices in accordance with Section 8-28-404 including a description of all equipment served by those devices;
- 502.3 Records of daily inspection of pressure relief devices subject to this Rule that are equipped with telltale indicators, including the time of inspection, and the identity of operator conducting the inspection;
- 502.4 Records of monitoring of any pressure relief device subject to this Rule as required by Section 8-28-503.

(Adopted 9/6/89; Amended 6/1/94; 12/17/97; Renumbered, Amended 12/21/05)

8-28-503 Monitoring: Effective June 1, 2007, any person subject to this Rule shall monitor all atmospheric pressure relief devices using a Monitoring System that satisfies the following requirements:

- 503.1 The Monitoring System shall be designed, installed, maintained, and operated so that it is capable of detecting any Release Event and notifying operators that the Release Event has occurred;
- 503.2 The Monitoring System shall be designed, installed, maintained and operated so that it is capable of determining the date and time at which a Release Event occurred, the duration of the Release Event and the type and amount of material released;
- 503.3 The Monitoring System shall include a mechanism for ensuring that all elements of the system are functioning properly by checking the components of the system at least once per day. Such mechanisms may include equipment inspections, instrument calibrations or other means to ensure that equipment, personnel, and systems are operating properly.

(Adopted December 21, 2005)

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8-28-600 MANUAL OF PROCEDURES

8-28-601 Deleted December 17, 1997

8-28-602 Determination of Control Efficiency: The control efficiency as specified in Sections 8-28-214, 8-28-303.1, 8-28-304.2, and 8-28-405.2 (with the exception of non-enclosed flares) shall be determined as prescribed by any of the following methods: 1) BAAQMD Manual of Procedures, Volume IV, ST-7; 2) EPA Method 25 or 25A; 3) Flare control efficiency calculations approved by the APCO and EPA in writing; or 4) other methods to demonstrate control efficiency approved by the APCO and EPA in writing. A source shall be considered in violation if the VOC emissions measured by any of the referenced test methods exceed the standards of this rule.

(Adopted 6/1/94; Amended 12/17/97; 12/21/05)

8-28-603 Deleted December 17, 1997

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