YOLO-SOLANO AIR QUALITY MANAGEMENT DISTRICT

RULE 2.23 - FUGITIVE HYDROCARBON EMISSIONS
(Revised August 13, 1997)

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100 GENERAL

101 **PURPOSE:** The purpose of this rule is to control fugitive emissions of hydrocarbons from oil and gas production and processing facilities, refineries, chemical plants, gasoline terminals, and pipeline transfer stations in conformance with RACT determinations approved by the California Air Resources Board (CARB) to meet the requirements of the California Clean Air Act.

102 **APPLICABILITY:** This rule is applicable to refineries, chemical plants, oil and gas production fields, natural gas processing plants, gasoline terminals, and pipeline transfer stations to limit fugitive emissions of volatile organic compounds from components such as valves and flanges, fittings, pumps, compressors, pressure relief devices, diaphragms, hatches, sightglasses, and meters.

110 **EXEMPTION - INSPECTION REQUIREMENTS:** The provisions of Section 301 of this rule shall not apply to the following cases, where the person seeking the exemption shall supply the proof of the applicable criteria to the satisfaction of the Air Pollution Control Officer:

110.1 Components buried below ground.

110.2 Components, except those at natural gas processing plants, exclusively handling fluids with a volatile organic compound concentration of 10 percent by weight or less, as determined according to test methods specified in Section 504 of this rule; or components exclusively handling liquids, if the weight percent evaporated is 10 percent or less at 150^{o}C (302^{o}F), as determined by ASTM Method D86-82.

111 **EXEMPTION - STORAGE TANKS:** The requirements of Section 305.1 shall not apply to any pressure relief device on external floating roof tanks storing material with a true vapor pressure of less than 11 psig.

112 **EXEMPTION - GASOLINE TERMINALS:** Until January 1, 1998, the requirements of Section 305 shall not apply to pressure relief devices at Gasoline Terminals.

113 **EXEMPTION - LOW VAPOR PRESSURE:** The provisions of Section 305 shall not apply to pressure relief devices which handle only organic liquids with a true vapor pressure less than 2.6 mm Hg (0.05 psia) or exhibit a 10% evaporation point greater than 150^{o}C (302^{o}F) as determined ASTM Method D86-82.

200 DEFINITIONS

201 **BACKGROUND:** A reading expressed as methane on a portable hydrocarbon detection instrument which is taken at least three meters (10 feet) upwind from any components to be inspected and which is not influenced by any specific emission point.

202 **CHEMICAL PLANT:** **CHEMICAL PLANT:** Any facility engaged in producing organic or inorganic chemicals, and/or manufacturing products by chemical processes. Any facility that has 282 as the first three digits in its Standard Industrial Classification Code as defined in the Standard Industrial Classification Manual is included. 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.

203 **COMPONENT:** Any valve, fitting, pump, compressor, pressure relief device, diaphragm, hatch, sightglass, or meter. They are further classified as:

203.1 A major component is any 4-inch or larger valve, any 5-hp or larger pump, any compressor, and any 4-inch or larger pressure relief device.

203.2 A minor component is any component not specified in Section 203.1.

203.3 A critical component is any component which would result in the automatic shutdown of the process unit if these components were shutdown. These components shall be identified by the source and approved by the Air Pollution Control Officer.

204 **COMPRESSOR:** A device used to compress gases and/or vapors by the addition of energy, and includes all associated components used for connecting and sealing purposes.

205 **EXEMPT COMPOUNDS:** For a current listing of exempt compounds see Section 214 of District Rule 1.1, General Provisions and Definitions.

206 **FITTING:** A component used to attach or connect pipes or piping details, including but not limited to flanges and threaded connections.

207 **GASOLINE TERMINAL:** A gasoline distribution facility that dispenses more than 20,000 gallons per day consisting of gasoline loading facilities where delivery to the facility's storage containers is by means other than truck.

208 **HATCH:** Any covered opening system that provides access to a tank or container.

209 **INACCESSIBLE COMPONENT:** Any component located over fifteen (15) feet above ground when access is required from the ground; or any component located over six (6) feet away from a platform when access is required from that platform.

210 **LIQUID LEAK:** A visible mist or dripping of liquid volatile organic compounds at the rate of more than three drops per minute. A major liquid leak is a visible mist or continuous flow of liquid VOC. A minor leak is any liquid VOC leak that is not a major leak and drips liquid at a rate of more than three drops per minute.

211 **MAJOR GAS LEAK:** For any component is the detection of total gaseous hydrocarbons in excess of 10,000 ppm as methane above background measured according to the test methods specified in Section 504 of this rule.

212 **MINOR GAS LEAK:** For any component is the detection of total gaseous hydrocarbons in excess of 1,000 ppm but not more than 10,000 ppm as methane above background measured according to the test methods specified in Section 504 of this rule.

213 **NATURAL GAS:** A mixture of gaseous hydrocarbons, with at least 80 percent methane, and less than 1 percent, on a weight basis, of volatile organic compounds, excluding ethane, determined according to test methods specified in Section 504 of this rule.

214 **NATURAL GAS PROCESSING PLANT:** A facility engaged in the separation of liquids from field gas and/or fractionation of the liquids into gaseous products, such as ethane, propane, butanes, and natural gasoline. Excluded from this definition are compressor stations, dehydration units, sweetening units, field treatment, underground storage facilities, liquified natural gas units, and field gas gathering systems unless these facilities are located at a natural gas processing plant.

215 **OIL AND GAS PRODUCTION FIELD:** A facility on which crude petroleum and/or natural gas production and handling are conducted, as defined in the Standard Industrial Classification Manual as Industry No. 1311, Crude Petroleum and Natural Gas. This definition shall also include injection facilities for disposal of water or brine produced in oil and gas production fields.

216 **PIPELINE TRANSFER STATION:** A facility which handles the transfer and storage of petroleum products or crude petroleum in pipelines.

217 **PLATFORM:** Any raised, permanent, horizontal surface that provides access to components.

218 **PRESSURE RELIEF DEVICE (PRD):** A pressure relief valve or a rupture disc.

219 **PRESSURE RELIEF VALVE:** A valve which is automatically actuated by upstream static pressure, and used for safety or emergency purposes.

220 **PUMP:** A device used to transport fluids by the addition of energy, and includes all associated components used for connecting or sealing purposes.

221 **REFINERY:** A facility engaged in producing gasoline, kerosine, distillate fuel oils, residual fuel oils, lubricants or other products through the distillation of petroleum or through redistillation, cracking, rearrangement, or reforming of unfinished petroleum derivatives, defined in the Standard Industrial Classification Manual as Industry No. 2911, Petroleum Refining.

222 **REPAIR:** Any corrective action for the purpose of eliminating leaks.

223 **RUPTURE DISC:** A thin metal diaphragm held between flanges for the purpose of isolating a volatile organic compound from the atmosphere or from a downstream pressure relief valve.

224 **STUFFING BOX:** A packing gland, a chamber, or a "box" to hold packing material compressed around a moving pump rod or valve stem by a "follower" to prevent the escape of gases or liquids. For the purpose of this rule, stuffing box seals are considered as part of the pump seals.

225 **TURNAROUND:** A scheduled shutdown for maintenance and repair work of a manufacturing process that is independent of other processes in the facility.

226 **VALVE:** A device that regulates or isolates the fluid flow in a pipe, tube, or conduit by means of an external actuator; including flanges, flange seals, and other components used for attachment or sealing.

227 **VOLATILE ORGANIC COMPOUNDS:** Any compound containing at least one atom of carbon except exempt compounds listed in Section 214 of Rule 1.1, General Provisions and Definitions.

300 STANDARDS

301 **INSPECTION FREQUENCIES:** 301.1

a. All pump seals, compressor seals, and pressure relief devices shall be inspected for leaks once during every manned operating shift or every eight-hour period except for components at oil and gas production fields and pipeline transfer stations which shall be inspected for leaks once per day. A leak identified by this Section shall be any liquid leak, a visual vapor leak, audible leaks, the presence of bubbles using soap solutions, or a leak identified by a vapor analyzer. All pumps, compressors, and pressure relief devices at manned oil and gas production fields and pipeline transfer stations shall be inspected for leaks once per day and components located at unmanned facilities shall be inspected once per week.
b. Any leak which is identified during the inspection of components shall be measured to quantify emission concentrations according to EPA Reference Method 21.

301.2 All components shall be inspected quarterly according to EPA Reference Method 21 except as provided in Sections 301.3 and 301.5 of this rule.

301.3

a. All inaccessible components shall be inspected annually according to EPA Reference Method 21.
b. All threaded connections and flanges shall be inspected for leaks according to EPA Reference Method 21 immediately after being placed in service and annually thereafter.

301.4 A pressure relief device shall be inspected according to EPA Reference Method 21 within three (3) calendar days after every pressure relief.

301.5 The inspection frequency for components, except pump seals and compressor seals, as required in Section 301.2 of this rule, may change from quarterly to annually, provided that all of the following conditions are met:

a. All components at the facility have been successfully operated and maintained with no liquid leaks and no major gas leaks exceeding 0.5 percent of the total components inspected per inspection period for twelve consecutive months, and
b. The above is substantiated by documentation and written approval obtained from the Air Pollution Control Officer.

301.6 Any annual inspection frequency approved in Section 301.5, shall revert to quarterly, should any liquid leak or major gas leak exceeding 0.5 percent of the total components inspected per inspection period for twelve consecutive months.

301.7 All leaking components shall be affixed with brightly colored, weatherproof tags showing the date of leak detection. These tags shall remain in place until the components are repaired and reinspected.

301.8 Any annual inspection frequency approved in Sections 301.6 of this Rule shall revert to the inspection frequencies specified in Sections 301.2 and 301.3 should liquid leaks or major gas leaks exceed 0.5 percent of the total components inspected per inspection period.

302 **EQUIPMENT REPAIR:**

302.1

a. All noncritical components shall be successfully repaired or replaced within the following time periods after detection of the leak according to**Table 1**, Repair Periods, except where otherwise specified in Section 305.
b. Leaks from components shall be immediately minimized to stop or reduce leakage to the atmosphere.
c. All leaks from critical components shall be minimized to the extent possible and shall be replaced with Best Available Control Technology equipment as determined in accordance with District Rule 3.4, NEW SOURCE REVIEW, during the next process unit turnaround.

TABLE 1 REPAIR PERIODS

Type of Leak	Time Period[1]
Minor Gas Leak	14 Days
Major Gas Leak	5 Days

Major Gas Leak over 50,000 ppm	1 Day[2, 3]
Major Liquid Leak	1 Day[2, 3]
Minor Liquid Leak	2 Days[2]

[1.] DAY MEANS A 24 HOUR PERIOD FROM THE TIME OF LEAK DETECTION.

[2.] UNLESS PROHIBITED BY CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (CAL OSHA) STANDARDS.

[3.] COMPONENTS LOCATED AT OIL AND GAS PRODUCTION FACILITIES OR PIPELINE TRANSFER STATIONS SHALL BE REPAIRED WITHIN TWO DAYS.

302.2 The repaired or replaced component shall be re-inspected per EPA Reference Method 21 by the operator within 30 days of the repair or replacement.

302.3 A component or parts which incur five repair actions for a liquid or major gas leak within a continuous twelve-month period shall be replaced with Best Available Control Technology equipment as determined in accordance with District Rule 3.4, NEW SOURCE REVIEW.

303 **OPEN-ENDED LINES AND VALVES:** Open-ended lines and valves located at the end of lines shall be sealed with a blind flange, plug, cap, or a second closed valve at all times except during operations. Operations include draining or degassing operations, connection of temporary process equipment, sampling of process streams, emergency venting, and other normal operational needs.

304 **HATCHES:** Hatches shall be closed at all times except during sampling, adding process materials, or attended maintenance operations.

305 **PRESSURE RELIEF DEVICES:** The following requirements shall apply to pressure relief devices in addition to the requirements specified in Sections 301, 302 and 303 of this rule:

305.1 **Pressure Relief Valves:** Until the next process unit turnaround or January 1, 1998, whichever date is earlier, a person shall not use a pressure relief valve on any equipment if the concentration of volatile organic compounds in such a valve, exceeds 10,000 ppm (expressed as methane) above background, unless:

a. The emission is vented to a vapor recovery or disposal system that is at least 95% efficient as determined per Section 504.6 of this rule; or
b. The pressure relief valve is protected by a rupture disc located upstream of the pressure relief device.

The above noted exceptions only apply to this Section.

305.2 **Leak Standard:** After the next process unit turnaround or January 1, 1998, whichever date is earlier, a person shall not use a pressure relief device on any equipment if the concentration of volatile organic compounds in such a device, exceeds 100 ppm (expressed as methane) above background. Effective January 1, 1998, the concentration of both volatile organic compounds and methane shall not exceed 100 ppm (expressed as methane) above background.

305.3 **Non-repairable Pressure Relief Devices:** Effective September 23, 1994, during the next process unit turnaround, a person shall replace a non-repairable pressure relief device with a device that meets the requirements of Section 305.2. For the purposes of this Section, a non-repairable pressure relief device is any such device that cannot be taken out of service without shutting down the process which it serves.

305.4 **Inaccessible Pressure Relief Devices:** Effective September 23, 1994, during the next process unit turnaround, a person shall replace an inaccessible pressure relief device with a device that meets the requirements of Section 305.2.

400 ADMINISTRATIVE REQUIREMENTS

401 **EQUIPMENT IDENTIFICATION:** 401.1 All major components and critical components shall be clearly and visibly physically identified for inspection, repair, replacement, and recordkeeping purposes.

401.2 All major, critical, and inaccessible components except flanges and threaded connections shall be clearly identified in diagrams for inspection, repair, replacement, and recordkeeping purposes as approved by the Air Pollution Control Officer.

401.3 The information required for component identification in Sections 401.1 and 401.2 of this rule shall be initially submitted to the Air Pollution Control Officer by September 23, 1994 for approval and thereafter upon request.

401.4 The Air Pollution Control Officer shall be notified in writing of any change in the identification of a major component.

402 **COMPLIANCE SCHEDULE:** Effective March 23, 1995, any person who operates a facility subject to this Rule shall comply with all the requirements of Sections 301, 302, 303, and 304 of this rule.

500 MONITORING AND RECORDS

501 **RECORDS:** All records of operator inspection and repair shall be maintained at the facility for the previous five (5) year period and made available at the time of District inspection.

502 **INSPECTION LOGS:** Each facility operator shall maintain an inspection log, containing at a minimum, the following:

502.1 Name, location, type of components, and description of any unit where leaking components are found;

502.2 Date of leak detection, emission level (ppm) of leak, and method of leak detection;

502.3 Date and emission level (ppm) of recheck after leak is repaired; and

502.4 Total number of components inspected and a total number and percentage of leaking components found by component types.

503 **LEAKS DETECTED:** Records of leaks detected by a quarterly or annual operator inspection, and each subsequent repair and reinspection, shall be submitted to the Air Pollution Control Officer upon request.

504 **TEST METHODS:** 504.1 Measurements of total gaseous hydrocarbon leak concentrations shall be conducted according to EPA Reference Method 21. The analyzer used shall be calibrated with methane.

504.2 The volatile organic compound content of fluids shall be determined using ASTM Methods E-168-88, E-169-87, or E-260-85.

504.3 Determination of exempt compounds shall be performed in accordance with ASTM Method D-4457-85.

504.4 Determination of evaporated compounds of liquids shall be performed in accordance with ASTM Method D-86-82.

504.5 Determination of true vapor pressure of organic compounds shall be performed in accordance with the applicable procedures set forth in Section 12.3, Compilation of Air Pollutant Emission Factors, Vol. I, AP-42, U.S. EPA. True vapor pressures for organic liquids shall be determined from Table 12.3-3. True vapor pressures for crude oils shall be determined by using Figures 12.3-1A and 12.3-1B. For refined petroleum stocks, Table 12.3-2 shall be used.

504.6 Control efficiency and emission rates of control devices shall be determined by EPA Method 25. Collection efficiency shall be determined according to "VOM Measurement for Capture Efficiency", 40 CFR 52.741, Appendix B.