RULE 443 LEAKS FROM SYNTHETIC ORGANIC CHEMICAL AND POLYMER MANUFACTURING

Adopted 6-5-79
(Amended 11-29-83, 11-20-84, 10-31-89, 9-25-90, 11-16-93, 9-5-96)

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100 GENERAL

101 **PURPOSE:** To limit emissions of volatile organic compounds from leaking components including but not limited to: flanges and affected devices which have the potential to vent to the atmosphere at chemical plants that manufacture synthetic organic chemicals and polymers.

102 **EXEMPTION, VACUUM CONDITION:** The provisions of this rule shall not apply to affected devices or flanges which are part of a system which is operating at 5 kPa (kilopascals) (0.7 psi) or greater below atmospheric pressure.

103 **EXEMPTION, VAPOR PRESSURE:** The routine monitoring requirements of Section 302 shall not apply to those volatile organic compounds with a vapor pressure less than or equal to 0.3 kPa at 20^{o}C (0.05 psia at 68^{o}F) as determined by methods specified in Section 501.5.

200 DEFINITIONS

201 **AFFECTED DEVICES:** Including but not limited to valves, pumps, compressors, open-ended lines, sampling connections, agitators and pressure relief devices.

202 **AGITATOR:** Any device or apparatus with an external shaft used to stir, blend, shake, or mix process streams containing VOC.

203 **BACKGROUND:** A reading as methane on a portable hydrocarbon detection instrument which is determined at least three (3) meters upwind from the affected device or flange to be inspected and uninfluenced by any specific emission point.

204 **CHEMICAL PLANT:** A chemical plant is any plant producing organic chemicals and/or manufacturing products by organic chemical processes subject to Rule 201.

205 **COMPRESSOR:** A machine used to compress, or increase pressure on, gases.

206 **ESSENTIAL AFFECTED DEVICE OR FLANGE:** An affected device or flange which cannot be taken out of service without shutting down the process unit it serves.

207 **EXEMPT COMPOUND:** For the purposes of this rule, “exempt compound” has the same meaning as in Rule 101—GENERAL PROVISIONS AND DEFINITIONS.

208 **FLANGE:** A projecting rim on a pipe or piping component used to attach it to another piping detail.

209 **HEAVY LIQUID:** A fluid with vapor pressure less than or equal to 0.3 kPa at 20^{o}C (0.04 psia at 68^{o}F) as determined by the methods specified in Section 501.5.

210 **INACCESSIBLE AFFECTED DEVICE OR FLANGE:**

210.1 An affected device or flange that would require the elevation of monitoring personnel higher than two (2) meters above permanent support surfaces or require scaffolding; or

210.2 An affected device or flange located more than two (2) meters away from a platform when access is required from a platform.

211 **LEAK:** A leak is :

211.1 The dripping of liquid volatile organic compounds in excess of three drops per minute; or

211.2 A reading as methane on a portable hydrocarbon detection instrument of 10,000 ppm or greater above background when measured within one centimeter of the source; or

211.3 The appearance of a visible mist.

212 **LEAK MINIMIZATION:** The tightening, adjustment, or addition of packing material to any affected device or flange, or the replacement of any affected device or flange, or the addition or replacement of gaskets to flanges which reduces the rate, appearance, or concentration of leakage from the affected device or flange.

213 **LIGHT LIQUID:** A fluid with vapor pressure greater than 0.3 kPa at 20^{o}C (0.04 psia at 68^{o}F) as determined by the methods specified in Section 501.5.

214 **PRESSURE RELIEF DEVICE:** A device used to relieve pressure in applications where process pressure may exceed the maximum allowable working pressure of the processing equipment.

215 **PROCESS UNIT:** The group of all equipment in a continuous line involved in the manufacturing or processing of synthetic organic chemicals or polymers.

216 **PUMP:** A machine or device for transferring a liquid or gas from a source or container through tubes or pipes to another container or receiver.

217 **VALVE:** Any device that regulates flow of a fluid in a piping system by means of an external actuator acting to permit or block passage of a fluid including the attached flange and the flange seal.

218 **VOLATILE ORGANIC COMPOUND (VOC):** For the purposes of this rule, “volatile organic compound” has the same meaning as in Rule 101—GENERAL PROVISIONS AND DEFINITIONS.

300 STANDARDS

301 **AFFECTED DEVICES AND FLANGES:**

301.1 A person shall not use any affected device or flange at a chemical plant for handling volatile organic compounds unless such affected device or flange does not allow the volatile organic compound being handled to leak into the atmosphere.

301.2 Each affected device located at the end of a pipe or line containing volatile organic compounds shall be sealed with a blind flange, plug, or cap when not in use, except for any of the following:

a. Valves on product sampling lines
b. Safety pressure relief valves
c. Bleeder valves in double block and bleeder valve systems
d. Water drain valves
e. Loading spouts

301.3 Each affected device or flange which has been discovered to be leaking shall be affixed with a weatherproof, brightly colored, readily visible tag bearing the date the leak was discovered. The tag shall remain in place until the leaking affected device is repaired or replaced, reinspected and found to be in compliance with the requirements of this rule.

302 **INSPECTION REQUIREMENTS:** Each affected device or flange handling volatile organic compounds shall be inspected for leaks according to the following schedule:

302.1 Quarterly inspections with a portable hydrocarbon detection instrument for the following affected devices in VOC service:

a. Pumps and valves in light liquid service.
b. Valves, compressors and pressure relief devices in gas service.

302.2 Weekly inspections for visible leaks for pumps in light liquid service.

302.3 Inspection within 24 hours after every over-pressure relief to ensure the valve has properly reseated for every pressure relief device.

302.4 Annual inspections for all flanges using a portable hydrocarbon detection device.

302.5 Annual inspection of valves, if less than 2% of all valves associated with a process unit in VOC service are found to be leaking for five consecutive quarterly inspections. Quarterly inspections must be resumed if during the annual inspection more than 2% of the valves are found to be leaking.

303 **REPAIR REQUIREMENTS:**

303.1 Each leaking affected device or flange shall be repaired within two working days after detection of such leak, except as provided in Subsection 303.2. The repairs shall be such that there will be a no leak condition.

303.2 For each essential affected device or flange found to be leaking that cannot be brought into compliance with Section 303.1, the following actions shall be taken:

a. If, after efforts to repair in accordance with Section 303.1 without shutting down are completed and the leak rate is less than 10 drops per minute, or the detectable hydrocarbon concentration is less than 75,000 ppm (expressed as methane), but more than 10,000 ppm (expressed as methane) above background as measured within 1 centimeter of the source, all of the following actions shall be taken:

1. Within two working days of discovery of non-repairability, the Air Pollution Control Officer shall be given notice of the date the essential affected device or flange will be repaired.
2. Within two working days of repair, the Air Pollution Control Officer shall be notified of the date of repair.
3. Inspection of such essential affected device or flange shall be made monthly until such essential affected device or flange is returned to a no leak condition.
4. Repairs to bring such essential affected device or flange to a no leak condition shall be completed at the next process turnaround or plant shutdown or within six months whichever is the shorter length of time.

b. If, after efforts to repair in accordance with Section 303.1 without shutting down are completed and the leak rate is 10 drops per minute or greater, or appearance of a visible mist continues, or the detectable hydrocarbon emissions are 75,000 ppm (expressed as methane) or greater measured within 1 centimeter of the source, one of the following actions shall be taken.

1. Leak minimization repairs shall be made within two (2) days which reduces the leakage rate to the rate stated in Subsection 303.2.a and such essential affected device shall be subject to the provisions of Subsection 303.2.a, or
2. The emissions from the leak shall be reduced by 90% within two (2) working days by the use of an emission control device, as determined by the methods specified in Sections 501.3 and 501.4, or
3. A petition for a variance shall be filed in accordance with Rule 602, BREAKDOWN CONDITIONS, EMERGENCY VARIANCES.

303.3 A person complying with Sections 303.1, 303.2.a, 303.2.b.1, and 303.2.b.2 shall be exempt from the provisions of Rule 602, BREAKDOWN CONDITIONS, EMERGENCY VARIANCES.

304 **INACCESSIBLE AFFECTED DEVICES AND FLANGES:** Inaccessible affected devices and flanges shall be exempt from provisions of Section 302, provided:

304.1 The number of inaccessible affected devices and flanges subject to this section does not exceed 5% of the total number of affected devices or flanges associated with a process unit subject to Section 302, and

304.2 A list of the inaccessible affected devices and flanges, including location, subject to this Section is made available to the Air Pollution Control Officer upon request, and

304.3 The reason why the affected device or flange is inaccessible is provided with the list prepared pursuant to Section 304.2, and

304.4 The inaccessible affected devices or flanges are inspected annually.

400 ADMINISTRATIVE REQUIREMENTS

401 **VIOLATION:** Any leak originally identified by the Air Pollution Control Officer is a violation.

500 MONITORING AND RECORDS:

501 **TESTING PROCEDURE**: A result by any of the below listed test methods which shows non-compliance with any provision of the rule shall constitute a violation of the rule.

501.1 **LEAK DETECTION:** EPA Reference Method 21 shall be used to determine the existence of a leak.

501.2 **VOC CONTENT:** VOC weight percent of process fluids shall be determined by ASTM Method E-168, E-169, E-260, EPA Method 24.

501.3 **CONTROL DEVICE:** Control efficiency and emission rates of control devices shall be determined by EPA Method 25.

501.4 **COLLECTION EFFICIENCY:** Collection efficiency shall be determined using Environmental Protection Agency Guidelines for Developing Capture Efficiency Protocols, 55 Federal Register 26865, June 29, 1990.

501.5 **VAPOR PRESSURE:** Vapor pressures may be obtained from standard reference texts or may be determined by ASTM D-2879-86.

501.6 **DETERMINATION OF EXEMPT PERFLUOROCARBON COMPOUNDS:** If any of the perfluorocarbons are being claimed as exempt compounds, the person making the claim must state in advance which compounds are present, and the EPA-approved test method used to make the determination of these compounds.

502 **RECORD KEEPING:** A person subject to this rule shall maintain records of inspections for two years and make inspection records available for review by the Air Pollution Control Officer upon request.

502.1 Such records shall include the following for each inspection: identity of the device or flange, date of inspection, date of detection of leak, leak rate, date of repair, leak rate after repair, date when leak free, date when device or flange returns to regular inspection schedule.