

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING AND COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES	PAGE
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**Revised RULE 1173(h)(3)
ATMOSPHERIC PRD
MONITORING PLAN**

COMPANY NAME AND ADDRESS

DeMenno/Kerdoon
2000 N. Alameda Street
Compton, CA 90222

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EQUIPMENT LOCATION

DeMenno/Kerdoon
2000 N. Alameda Street
Compton, CA 90222

Facility I.D.: 800037

Claim of Confidentiality: No

RULE 1173 PRD MONITORING AND COMPLIANCE PLAN REQUIREMENTS

The DeMenno/Kerdoon (D/K) facility in Compton is subject to the requirements of SCAQMD Rule 1173 as the operator of a lubricating oil and grease re-refiner, as defined in *{Rule 1173(c)(15)}*.

Rule 1173(c)(15) – LUBRICATING OIL AND GREASE RE-REFINER is a facility engaged in the blending, compounding, and re-refining of lubricating oils and greases from purchased mineral, animal, and vegetable materials, as defined in SIC Code 2992.

D/K re-refines waste oil and has listed their primary SIC code as 2992.

Section (h) of the most recent Rule 1173 (amended February 6, 2009) lists the following atmospheric process pressure relief device (PRD) requirements for compliance plans:

Rule 1173(h)(3) – The operator of a lubricating oil and grease re-refiner or a marine terminal shall monitor atmospheric process PRD’s by use of electronic process control instrumentation that allows for real time continuous parameter monitoring, starting January 1, 2009, and telltale indicators for the atmospheric process PRD’s where parameter monitoring is not feasible. The telltale indicators shall be installed no later than December 31, 2007.

Rule 1173(h)(4) – By December 31, 2007, the operator shall submit to the District a compliance plan or a revised compliance plan, containing the inventory of atmospheric process PRD’s by size, set pressure and location, and indicate the options chosen to comply with paragraph (h)(3). If applicable, the operator shall indicate the process parameter selected for continuous monitoring and the justification for such selection.

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A/N 476345

D/K submitted their Rule 1173 compliance plan for atmospheric PRD's on December 14, 2007, listing nine (9) pressure relief devices, thus meeting the requirements of *{Rule 1173(h)(4)}*, and notifying the District that the installation of the continuous pressure monitoring at each PRD was completed. This Rule 1173 compliance plan was approved on January 18, 2011.

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D/K submitted a revised Rule 1173 compliance plan for atmospheric PRD's on May 3, 2011, listing nine (9) pressure relief devices. D/K submitted, via email, an updated Rule 1173 compliance plan on May 4, 2011. Changes are indicated by strikeout and boldface in the table below. D/K has installed continuous pressure monitoring at each PRD.

PRESSURE RELIEF VALVE INVENTORY

SCAQMD Device No.	D/K Equipment No.	Location	Inlet Size (in.)	Outlet Size (in.)	Set Pressure (psig)
D125	C201	Atmospheric Dehydration Tower	4	6	60
D126	C202	Atmospheric Dehydration Tower	4	6	60
D127	C203	Vacuum Dehydration Tower	3 4	4 6	25 60
D188	C207	Vacuum Unit #1	3	4	40
D236	C205	Vacuum Unit #2	3	4	40
D178	C206	Vacuum Dehydration Vessel	3	4	25 60
D141	D205	Emergency Waste Knock-Out Pot			
D128	D-204	Relief Valve to 3" Waste Gas Line	3	4	15
C281	Dowtherm Return Line	New Afterburner	6	8	175
C281	Expansion Drum	New Afterburner	1.5	3	175

The continuous process parameter monitoring (pressure) for each PRD is recorded by D/K's existing electronic continuous process monitoring system (CPMS). According to D/K, the accuracy of their pressure transmitters is generally $\pm 0.5\%$ of the working range of the transmitter. The process monitoring for the nine atmospheric process PRD's meets the requirements of *{Rule 1173(h)(3)}*.

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Emission estimation methodology for PRD releases

To estimate any PRD releases, D/K will use the release duration, pressure sensor data, and the PRD pressure setting as data inputs for the American Petroleum Institute's (API) pressure relief valve equations for design or sizing in API RP 521 (Section 3.6.2.1.1):

PRD Equation for Vapor or Gas Service

$$W_s = \frac{(ACK_d K_b K_c)(P+14.7)}{3600 \sqrt{\frac{(T+460)Z}{M}}}$$

$$W_{VOC} = W_s * VOC * t$$

$$W_{TVOC} = \sum W_{VOC}$$

Where:

A = Relief Valve Orifice Size

$$C = \text{Sizing Coefficient} = 520 \sqrt{k \left(\frac{2}{k+1} \right)^{\frac{k+1}{k-1}}}$$

k = Cp/Cv = Specific Heat Ratio for the released gas

Kd = Effective Coefficient of Discharge (use Kd = 0.975 in absence of manufacturer's PRD specific data)

Kb = Capacity Correction Factor

Kc = Combination Correction Factor. (Kc = 1 if no rupture disk; Kc = 0.9 if rupture disk)

M = Molecular Weight of the released gas

P = Pressure (psig), as measured with Continuous Process Monitoring System

T = Temperature (°F)

t = Recorded Duration of Release in Seconds by Electronic Monitoring Device

VOC = weight percent VOC in the released gas

Ws = Flow through the PRD, lb/sec

Wvoc = Flow of VOCs through the PRD

W_{TVOC} = Total VOC Released during the Event, lbs

Z = Compressibility Factor

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PRD Equation for Liquid Service

$$Q = 0.63AK_dK_wK_v\sqrt{\frac{P}{G}}$$

$$M = Q * 8.34 * G * t$$

Q = flow rate, (U.S. gallon per second)

K_d = Rated Coefficient of Discharge (use K_d = 0.65 in absence of manufacturer's PRD specific data)

K_w = Capacity Correction Factor (K_w = 1 for atmospheric back pressure)

K_v = Correction Factor due to Viscosity (assume = 1)

P = Pressure (psig), as measured with Continuous Process Monitoring System

G = Specific Gravity of the liquid at flowing temperature

M = Release per Event in lbs

t = Recorded Duration of Release in Seconds by Electronic Monitoring Device

For each PRD release event, it shall be assumed that the PRD is fully open for the duration of the release recorded by the monitoring device. Any alternative in determining the release duration or quantity shall be evaluated and approved in writing by the District.

Recommendations and Conditions

D/K has submitted the required Rule 1173 Compliance Plan. Based on this review of the compliance plan, approval of the plan with the following conditions is recommended:

CONDITIONS

1. The operator shall install and operate its atmospheric PRD monitoring systems in accordance with all data and specifications submitted with this application under which this plan is approved unless otherwise specified below.
2. The operator shall install electronic monitoring devices on all nine atmospheric PRDs identified in Attachment A that are subject to Rule 1173(h)(3).

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3. The operator shall use a continuous pressure monitoring system (CPMS) to continuously monitor and record the process pressure that is used as an indicator of release for the PRD identified in the plan.
4. CPMS shall be defined to include the pressure sensors or transmitters, receivers, and the data acquisition or recording systems. Continuous recording shall be defined as the recorded pressure readings at a minimum of one minute intervals. The data recording systems shall be accurately synchronized with the time and date of the measurement.
5. The operator shall ensure that the CPMS for each of the subject atmospheric PRDs is properly maintained and kept in good operating condition at all times when the process equipment that it serves is in operation, except when it is taken out of service due to the following reasons:
 - a. Failure, breakdown, or unplanned maintenance of the data acquisition or recording system, which shall not exceed 48 hours cumulatively in any given calendar quarter. The operator shall also report the time period that the data recording system is out of service in the quarterly report.
 - b. Planned maintenance of the CPMS shall not exceed 7 days in a calendar year unless the operator has notified the District by telephone at 1-800-CUT-SMOG detailing the specific reason for the maintenance within 24 hours of taking the CPMS from service.
6. The operator shall use following equation(s) or other alternative District-approved methodology to determine the volatile organic compound (VOC) emissions from a PRD release. The operator shall submit a plan application in order for the District to evaluate an alternative VOC emission estimation methodology.

PRD Equation for Vapor or Gas Service

$$W_s = \frac{(ACK_d K_b K_c)(P+14.7)}{3600 \sqrt{\frac{(T+460)Z}{M}}}$$

$$W_{\text{voc}} = W_s * \text{VOC} * t$$

$$W_{\text{TVOC}} = \sum W_{\text{voc}}$$

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Where:

A = Relief Valve Orifice Size

$$C = \text{Sizing Coefficient} = 520 \sqrt{k \left(\frac{2}{k+1} \right)^{\frac{k+1}{k-1}}}$$

k = Cp/Cv = Specific Heat Ratio for the released gas

Kd = Effective Coefficient of Discharge (use Kd = 0.975 in absence of manufacturer's PRD specific data)

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PRD Equation for Liquid Service

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Kw = Capacity Correction Factor (Kw = 1 for atmospheric back pressure)

Kv = Correction Factor due to Viscosity (assume = 1)

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P = Pressure (psig), as measured with Continuous Process Monitoring System
G = Specific Gravity of the liquid at flowing temperature
M = Release per Event in lbs
t = Recorded Duration of Release in Seconds by Electronic Monitoring Device

For each PRD release event, it shall be assumed that the PRD is fully open for the duration of the release recorded by the monitoring device. Any alternative in determining the release duration or quantity shall be evaluated and approved in writing by the District.

7. The operator shall calibrate and maintain each pressure sensor in accordance with manufacturer's specifications.
8. All components of the CPMS shall be made available to District personnel for inspection upon request.
9. The operator shall keep adequate records to show compliance with all plan conditions. Such records shall be made available to District personnel upon request. The operator shall maintain records for at least five years.
10. The provisions of this plan shall not apply to any PRDs that are determined to be no longer subject to Rule 1173(h)(3), including PRDs that have been removed, tied into a closed system, or are located on equipment that is out of service and hydrocarbon free. If the operator makes any changes allowed under this condition, the operator shall submit an updated inventory to the District within 12 months identifying changes to the inventory.

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ATTACHMENT A

PRESSURE RELIEF DEVICE INVENTORY

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