

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING AND COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES	PAGE
	10	1
	APPL. NO.	DATE
	523986	02/03/12
	PROCESSED BY	CHECKED BY
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**RULE 1173
COMPLIANCE
PLAN**

COMPANY NAME AND ADDRESS

Ultramar Inc.
2402 East Anaheim Street
Wilmington, CA 90744

Contact : Matt Smith
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EQUIPMENT LOCATION

2402 East Anaheim Street
Wilmington, CA 90744

Facility ID: 800026

Claim of Confidentiality: Yes

BACKGROUND

The Ultramar Corporation (Ultramar) currently operates a refinery located in the City of Wilmington. The South Coast Air Quality District (District) classifies the facility as being subject to Title V, and the requirements of the District's Regional Clean Air Incentive Market (RECLAIM) for Nitrous Oxides and Sulfur Oxides. Ultramar has been granted its Title V and RECLAIM facility permit.

In December of 2003, Ultramar submitted a Rule 1173 Compliance Plan application, No. 423346, that was approved by the District in December of 2004 (please see Attachment 1). That plan was to comply with the monitoring requirements of Rule 1173. Since Ultramar did not have any atmospheric PRDs at the time, the company was only required to submit a plan application for any changes to PRDs.

The Governing Board approved an amendment to Rule 1173 on 1 June 2007 and again on 6 February 2009. Under the District's latest revisions for its Rule 1173, a facility does not only require to monitor all of its atmospheric pressure relief valves/devices (PRDs), but is also required to install automatic monitoring devices that are tamper proof, and are capable of recording the time of release, and its duration as well. Furthermore, the electronic monitoring system must have the capability to use the collected data to quantify the emissions released to the atmosphere from each PRD. The electronic monitoring requirements in the District's Rule 1173 are as follows:

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING AND COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 10	PAGE 2
	APPL. NO. 523986	DATE 02/03/12
	PROCESSED BY	CHECKED BY
	JOHNNY PAN	

Table No. 1 Regulatory Citation

RULE 1173 SUBDIVISION (h)(1)	
Regulatory Citation	Rule Requirement
(A)	If a refinery has less than 50 atmospheric PRDs, it must install electronic valve monitoring devices on 50% of all PRDs in its inventory at a minimum by 1 January 2009. As for the remaining PRDs, all must be outfitted by 1 July 2009.
(B)	(i): If a refinery has more than 50 atmospheric PRDs, the facility must install electronic valve monitoring devices on at least 20% of PRDs in its inventory by 1 January 2009. (ii): Install electronic valve monitoring devices on atmospheric PRDs to reach 40% of its inventory by 1 July 2009. (iii): Install electronic valve monitoring devices on the remaining atmospheric PRDs in its inventory by 1 July 2010.
(C)	All atmospheric PRDs that are not outfitted with the electronic valve monitoring devices are required to be monitored for atmospheric releases by using the existing process instrumentation installed as part of the process control or telltale indicators until such time as the requirements of (h)(1)(A) and (B) are met.
(D)	As an alternative to (h)(1)(A) and (B), a refinery may delay the installation of electronic valve monitoring devices on all atmospheric PRDs until the next refinery turnaround after 1 June 2007 provided the refinery operator demonstrates to the satisfaction of the District that outfitting the PRDs is not feasible or is a safety hazard. This alternative schedule, however, needs a written approval from the District.
(E)	A refinery may choose to use multiple devices in addition to electronic PRD monitoring devices to monitor releases and quantify the amount of release. However, if the operator chooses to use a combination of devices, it must still comply with the schedule in (h)(1)(A) and (B) whichever is applicable and needs the District's approval for employing the devices on its PRDs.
(F)	PRDs that are connected to an air pollution control or vapor recovery are exempted from the requirements under (h)(1)(A) and (B). The operator can also propose, as an alternative to install electronic valve monitoring devices, to connect its process PRDs to a vapor recovery system or air pollution control on the condition that the PRDs will be connected at the next refinery turnaround after 31 December 2008 and identify in the Compliance Plan before 31 December 2008.
(G)	PRDs in service of heavy liquids that releases to drains and are subject to Rule 1176 are exempt from the electronic valve monitoring requirements of Rule 1173.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING AND COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES	PAGE
	10	3
	APPL. NO. 523986	DATE 02/03/12
	PROCESSED BY JOHNNY PAN	CHECKED BY

At the time of the amendment to Rule 1173 requiring the eventual installation of electronic monitoring devices, Ultramar indicated that its facility (refinery) did not have any PRDs that are subject to the electronic monitoring requirements of Rule 1173 in 2004. However, in a letter in December of 2008, Ultramar stated that it does have an existing PRD that is required to be installed with the electronic monitoring device meeting the requirements of Rule 1173. That letter, however, did not come with a plan application. In this latest submittal, received by the District in June of 2011, Ultramar included a Rule 1173 plan application (No.523896) and a Title V revision application (No. 523894) (a copy of the letter and inventory is in the file). The following table gives a simplified timeline of the changes in Ultramar's Rule 1173 plan:

Table No.1 Ultramar's Rule 1173 Compliance Plan History

Year	Ultramar's Rule 1173 Plan Action
2003	Ultramar submitted Rule 1173 Compliance Plan (Application No. 423346).
2004	District approved Rule 1173 plan (Application No. 423346). Ultramar did not have any PRDs subject to the electronic monitoring requirements of Rule 1173.
2008	Ultramar in a letter to the District dated 31 December 2008 (see letter in file) informs the District that it has an existing PRD that is subject to the requirements of Rule 1173. In addition, the company indicated that it installed an Accutech pressure transmitter for measuring PRD releases and an Accutech Base Radio unit for transmitting data (see Attachemnt 1 for 2008 letter and technical specifications of the monitoring devices already installed and oprating in 2008). However, the company did not submit a Rule 1173 compliance plan application or Title V administrative application.
2011	Ultramar submitted a plan application (Application No. 523986) and Title V administrative application (Application No. 523984). In its plan application, Ultramar also replaced the existing accutech pressure transmitter with a Honeywell acoustic transmitter/monitoring device, but kept the existing Accutech radio base (Ultramar provided the specification sheets for Accutech devices. The Honeywell specifications are downloaded by the District and was not included in any of Ultramar's submittals).

PROPOSED RULE 1173 COMPLIANCE PLAN AND EVALUATION

As required by Rule 1173, Ultramar has completed its inventory of all PRDs that must comply with the requirement of Rule 1173, which requires the installation of electronic monitoring devices. Table No. 2 provides the details of Ultramar's current PRD inventory at Ultramar's Wilmington refinery.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING AND COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 10	PAGE 4
	APPL. NO. 523986	DATE 02/03/12
	PROCESSED BY JOHNNY PAN	CHECKED BY

Table No. 2 PRD Inventory

Location and Identification					PRD Type and Specifications			Valve Type	Electronic Process Parameter Monitoring Rule 1173(h)(1)(A)
PRD ID No.	Process Unit Equipment ID No.	FP Process ID	FP System No.	FP Device No.	Set Press (psig)	Inlet Size (Inches)	Outlet Size (Inches)		
PSV 541	Ethyl Mercaptan Containers, E SD of LPG Loading Rack	12	2 & 3	D1624 & D1625	150	1.5	2.5	PSV	Ultrasonic Vibration

Note: The table was sent by the District requiring Ultramar to provide the details required by the table.

Under the District's Rule 1173 (h)(4), an inventory of Rule 1173 components subject to the rule needs to be clearly identified. The Ultramar's revised atmospheric PRD inventory, Table No. 2, complies with the identification requirements: the company's inventory clearly tags its only atmospheric PRD with an unique identification number, shows the location of the PRD, and gives the size of the PRD, pressure setting, and specifies the electronic monitoring device used to monitor PRD releases.

APPLICABLE RULE ANALYSIS

Rule 1173 (h)(1)(A) and (B) : Compliance Schedule Requirement

The District's Rule 1173 (h)(1) gives two schedules for complying with the new electronic monitoring and recording device requirements for atmospheric PRDs. These devices must also be able to quantify the emissions of each release. The compliance schedules are divided into two groups, one for facilities with fifty or less PRDs, and one for facilities with more than fifty PRDs. Ultramar falls under the fifty PRDs or less schedule.

Rule 1173 (h)(1) Analysis

Comply. Falling under the group with fifty or less atmospheric PRDs, Ultramar has to install monitoring devices on at least fifty percent of its PRDs by 1 January 2009 and reach one hundred percent by 1 July 2009 as required by (h)(1)(A). Ultramar completed the installation of electronic monitoring device under its inventory prior to 1 January 2009. At the time of its letter to the District in 31 December 2008, the company has already installed the monitoring

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING AND COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 10	PAGE 5
	APPL. NO. 523986	DATE 02/03/12
	PROCESSED BY JOHNNY PAN	CHECKED BY

device and started the required monitoring on its only atmospheric PRD that was required to comply with the electronic monitoring requirements of Rule 1173 (please see the email dated 20 July 2011 in this application file with data from monitoring device).

Rule 1173 (h)(1)(C): Monitoring with Process Instrumentation and Control Requirements

In paragraph (h)(1)(C), refineries are required to monitor their atmospheric PRDs that are not outfitted with electronic monitoring devices by using process control instrumentation or other indicators until all PRDs comply with the requirements of (h)(1).

Rule 1173 (h)(1)(C) Analysis

No Longer Applicable. Ultramar proposed to use tell-tale indicators to monitor releases from its PRDs. The method was used by Ultramar prior to the installation of electronic monitoring devices on its PRD. Since Ultramar has installed the required monitoring device for its only atmospheric PRD that is subject to Rule 1173 amendment, this requirement no longer applies.

Rule 1173 (h)(1)(D): Alternative Schedule for Installing Electronic Monitoring Devices

Not Applicable. (h)(1)(D) gives refineries the option of delaying the compliance schedule for installing PRD monitoring devices until the next turnaround after 1 June 2007 if the companies provide sufficient justification that it can not be done without jeopardizing safety. Ultramar in its application did not request to be placed under the alternative schedule.

Rule 1173 (h)(1)(E): Combination of Monitoring

Comply. (h)(1)(E) gives refineries the option to use a combination of devices or methods to demonstrate compliance with monitoring. Under Rule 1173 (h)(1)(A) and (B), refineries are required to install electronic monitoring devices, tamper-proof, that are capable of recording a release, the duration, and the amount of release.

To meet the Rule 1173 requirements, Ultramar has decided to use new electronic monitoring device, pressure relief valve design equations, existing data acquisition systems which will measure and record the duration of the release to quantify the emissions.

Specifically, Ultramar has chosen an approved ultrasonic monitoring device and receiver. The company switched out the original Accutech pressure transmitter that was in place by 2008 to comply with the Rule 1173 requirements with a new Honeywell acoustic monitoring device that connects to the original Accutech radio base that was also in place to receive signals from releases from the Accutech pressure transmitter. This new Honeywell electronic monitoring

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING AND COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 10	PAGE 6
	APPL. NO. 523986	DATE 02/03/12
	PROCESSED BY JOHNNY PAN	CHECKED BY

device is also capable of sending signals to the existing Accutech receiver/base radio, which then converts the signals, generated when a PRD release has occurred, to Ultramar's existing data acquisition system, Honeywell PHD system (DCS) that records the duration and the time of the release (please see Ultramar's submittal in the file).

Ultramar's new monitoring device, however, only monitors and records the opening of the PRD and duration of the emission release. The monitoring and recording device, however, do not automatically quantify the amount of release to the atmosphere. To quantify the releases, Ultramar proposes to use the time measured and recorded by the monitoring and recording device, and the PRD's pressure setting as data inputs for the American Petroleum Institute's (API) pressure relief valve equation for design or sizing in standard API RP 521. Ultramar will use those equations for the sizing of relief valves in gas service to quantify the release amount. The equations used in determining a release are as follows (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

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING AND COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 10	PAGE 7
	APPL. NO. 523986	DATE 02/03/12
	PROCESSED BY JOHNNY PAN	CHECKED BY

VOC = weight percent VOC in the released gas
 W_s = Flow through the PRD, lb/sec
 W_{voc} = Flow of VOCs through the PRD
 W_{TVOC} = Total VOC Released during the Event, lbs
 Z = Compressibility Factor

Rule 1173 (h)(1)(F): PRD Connection to Air Pollution Control or Vapor Recovery

Not Applicable. (h)(1)(F) allows refinery operators to connect any of its PRDs to either an air pollution control device or vapor recovery provided that the connections are made during the first refinery turnaround after 31 December 2008. Ultramar did not choose this option for its atmospheric PRD.

Rule 1173 (h)(1)(G): Exemption for Liquid PRDs

Not Applicable. (h)(1)(G) exempts atmospheric PRDs in liquid service from (h)(1)(A) and (B) if they are connected to drains or are part of a system subject to Rule 1176. Ultramar does not have any liquid PRDs.

RECOMMENDATIONS AND CONDITIONS

Because Ultramar chooses to use a combination devices to monitor, record, and quantify its PRD releases, the company has submitted a Rule 1173 Compliance Plan for the District's approval as required by the amended Rule 1173 (h)(1)(E). After a review of the Ultramar's plan, the District recommends approval with the following conditions:

CONDITIONS

1. The operator shall install and operate its atmospheric PRD monitoring system 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 as proposed in the PRD inventory and compliance plan on its atmospheric PRD in its inventory that is subject to Rule 1173 (h)(1)(B).
3. The operator shall use a continuous pressure monitoring system (CPMS) to continuously monitor and record the process pressure and the electronic monitoring device that are used as indicators of release for the PRD identified in the plan.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING AND COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 10	PAGE 8
	APPL. NO. 523986	DATE 02/03/12
	PROCESSED BY JOHNNY PAN	CHECKED BY

4. CPMS shall be defined to include the, electronic monitoring devices, pressure sensors or transmitters, receivers, and the data acquisitions or recording systems. Continuous recording shall be defined as the recorded pressure readings and electronic valve monitoring 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 the subject atmospheric PRD 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 e-mail detailing the specific reason for the maintenance within 24 hours of taking the CPMS from service. All notifications shall be forwarded to refinery.compliance@aqmd.gov.
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

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

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

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

Where:

A = Relief Valve Orifice Size

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING AND COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES	PAGE
	10	9
	APPL. NO. 523986	DATE 02/03/12
	PROCESSED BY JOHNNY PAN	CHECKED BY

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

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

For each PRD release event, it shall be assumed that the PRD is fully open from the time that the CPMS records a pressure value which is equal to or greater than the PRD setpoint until the time that the CPMS records a pressure value that is less than the PRD setpoint and/or other approved monitoring device detects the opening of the PRD until the monitoring device detects the closing of the PRD.

7. The operator shall calibrate and maintain each pressure sensor and electronic monitoring device 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 will not apply to the PRD if it is determined to be no longer subject to Rule 1173 (h), including the PRD being removed, being tied into a closed system, being modified so that it falls under the provisions of Rule 1173(h)(1)(G), or being located on equipment that is out of service and hydrocarbon free. If the operator

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING AND COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES	PAGE
	10	10
	APPL. NO. 523986	DATE 02/03/12
	PROCESSED BY JOHNNY PAN	CHECKED BY

makes any changes allowed under this condition, the operator shall submit an updated inventory to the District within 12 months identifying changes to the PRD.