

	<b>SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT</b> <i>ENGINEERING &amp; COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	<b>PAGES:</b> 6	<b>PAGE:</b> 1
		<b>A/N:</b> 474117	<b>DATE:</b> 2/10/2010
		<b>PROCESSED BY:</b> Meredith Hankins	<b>CHECKED BY:</b>

**RULE 1123 (REFINERY PROCESS TURNAROUNDS)  
COMPLIANCE PLAN**

**COMPANY NAME:** Tesoro Refining and Marketing Co.

**COMPANY ID:** 800436

**MAILING ADDRESS:** 2101 E. Pacific Coast Highway  
P.O. Box 817  
Wilmington, CA 90744

**EQUIPMENT LOCATION:** 2101 E. Pacific Coast Highway  
Wilmington, CA 90744

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**BACKGROUND:**

Tesoro Refinery is subject to Rule 1123 when performing refinery process turnarounds. Rule 1123(b)(1) prohibits venting to the atmosphere of any organic materials unless the vapors are "collected and contained for use as fuel or sent to a gas disposal system until the pressure in the vessel is below five pounds per square inch, gauge, or is within ten percent above the minimum gauge pressure at which the vapors can be collected, whichever is lower."

Rule 1123(b)(2) requires a compliance plan to be submitted to the District for every refinery that uses gas displacement or vacuum eduction to purge vessels during turnaround. The following criteria (at minimum) are required in this plan:

- A) the procedure used for gas displacement or eduction
- B) the disposition of the displaced or educed gases
- C) the stage in the displacement or eduction procedure at which the disposition is changed from a control facility to atmospheric venting
- D) the criteria by which said stage is identifiable.

In other words, the compliance plan requires **at least** a description of the gas displacement/eduction procedures, and explanations of where the gases go following the displacement/eduction, when the vessel is opened to the atmosphere, and how they determine when they can open to the atmosphere.

Rule 1123(c) requires certain records to be kept for two years, but since this is a Title V facility, these records will be kept for the required 5 years.

There is an exemption in 1123(d) that allows a refinery to vent dilute gases directly to the atmosphere if both of the following criteria are met:

	<b>SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT</b> <i>ENGINEERING &amp; COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	<b>PAGES:</b> 6	<b>PAGE:</b> 2
		<b>A/N:</b> 474117	<b>DATE:</b> 2/10/2010
		<b>PROCESSED BY:</b> Meredith Hankins	<b>CHECKED BY:</b>

- 1) The vessel has been depressurized as per Rule 1123(b)(1) prior to vessel purging or cleaning, and
- 2) The refinery demonstrates in its Rule 1123 Compliance Plan that venting the dilute gases to existing control equipment would likely damage equipment, cause the malfunction of pollution control or safety devices, or cause violations of safety regulations.

**Table 1 – Fee Summary**

A/N	Application Status	Fee Sched.	Fee Paid	Balance Due
474117	21	C	\$485.45	\$0.00

**Table 2 – Permit History**

Date	Event	Description
11/20/98	Submittal of Application	Equilon Enterprises (the original owner of this facility) submitted their Rule 1123 Compliance Plan to the AQMD for review and approval.
09/24/07	Change of Ownership	Tesoro submitted their Rule 1123 Compliance Plan to the AQMD for review and approval following a change of ownership at this facility.
12/18/09	Submittal of Revised Plan	Following A/I requests, Tesoro submitted their final updated and revised Rule 1123 Compliance Plan superseding all previous plans.

**PLAN EVALUATION:**

**Table 3 – Checklist for a Rule 1123 Compliance Plan**

Requirements	Per Rule 1123 (b) (2)	Compliance?		Remarks
		Yes	No	
The procedure used for gas displacement or eduction	(A)	X		Tesoro submitted separate procedures for gas displacement and gas eduction. The gas displacement procedure is followed for general pressure vessels, while the eduction procedure is used for reactor vessels where catalysts could be damaged by use of a purge gas.

	<b>SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT</b> <i>ENGINEERING &amp; COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	<b>PAGES:</b> 6	<b>PAGE:</b> 3
		<b>A/N:</b> 474117	<b>DATE:</b> 2/10/2010
		<b>PROCESSED BY:</b> Meredith Hankins	<b>CHECKED BY:</b>

Requirements	Per Rule 1123 (b) (2)	Compliance?		Remarks
		Yes	No	
The disposition of the displaced or educed gases	(B)	X		During depressurization, vapors are vented to either the flare gas recovery system (FGRS) or directly to the flare. Some vessels in the FCCU do not have direct connection to the flare/FGRS, and these are routed via temporary piping/hoses. Additional evaluation of these steps follows this table.
The stage in the displacement or eduction procedure at which the disposition is changed from a control facility to atmospheric venting	(C)	X		The vessels are initially depressured to the FGRS or flare until the vessel pressure reaches flare line pressure, which is known to be less than 5psig (~0.5psig). Any remaining vapors may then be further removed through gas displacement or eduction. The vessel is then opened to the atmosphere only when the pressure is below 5psig and the system is below 10% LEL.
The criteria by which said stage is identifiable.	(D)	X		Most vessels are equipped with a pressure gauge, which is used to determine that the pressure in the vessel is below 5psig. The pressure of vessels which do not have pressure gauges is monitored through the use of temporary gauges. Either an LEL monitor, or occasionally lab sampling, are used to determine that the LEL is below 10%.

### Disposition of the Vapors Released From the Vessel

#### Initial Depressurization (All Vessels)

First, all liquids are routed to storage tanks in compliance with District Rules 463 and 1178.

Vessels are then initially depressured to the Flare Gas Recovery System (FGRS), unless the vent gas volume exceeds the compressor capacity or the vent gas composition is incompatible with the FGRS (as per District Rule 1118). Some vessels in the FCCU do not have direct connections to the flare/FGRS, and so are routed to the flare/FGRS via temporary piping or hoses. The vent gases recovered by the FGRS are treated for H<sub>2</sub>S in an amine absorber and then sent to the refinery fuel gas system. Any vent gases which are not compressed in the FGRS (due to the capacity being exceeded or incompatible composition), are sent directly to the flare.

The initial depressurization to the FGRS continues until the vessel pressure reaches flare line pressure (~0.5psig). With some vessels, the vessel pressure is determined directly by pressure gauges located on the vessels. However, some vessels do not have gauges, and temporary gauges are used to determine when the vessel/system reaches a pressure lower than 5psig. The flare line pressure is monitored by gauges on the unit flare knock out drum.

	<b>SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT</b> <i>ENGINEERING &amp; COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	<b>PAGES:</b> 6	<b>PAGE:</b> 4
		<b>A/N:</b> 474117	<b>DATE:</b> 2/10/2010
		<b>PROCESSED BY:</b> Meredith Hankins	<b>CHECKED BY:</b>

Gas Displacement (General Vessels)

This procedure is followed for general pressure vessels subject to Rule 1123 in the process units listed in Table 4 below.

**Table 4 – Vessels Utilizing Gas Displacement**

Alky	Alkylation Unit
AFT	Alkylation Feed Prep Unit
Merox	Merox Treating Unit
HGU1	Hydrogen Generation Unit No. 1
HGU2	Hydrogen Generation Unit No. 2
HTU4	Hydrotreater No. 4
DCU	Delayed Coking Unit
Crude	Crude Unit
GCP	Gas Compression Plant
FCCU	Fluid Catalytic Cracking Unit
Bensat	Benzene Saturation Unit
Isomax	Benzene Isomerization Unit

Steam, nitrogen, or water is used to displace any remaining vapors following the initial depressurization to flare line pressure (~0.5psig). Because of incompatibility issues for the FGRS with low-BTU value gas streams, these inert gas-heavy streams are normally vented directly to the flare. Any liquids are sent to storage tanks in compliance with District Rules 463 and 1178. The vessels are not opened to the atmosphere until it is confirmed that the vessel pressure is below 5 psig and the LEL is below 10%.

Gas Eduction (Reactor Vessels)

This procedure is followed for all reactor vessels subject to Rule 1123 in the process units listed in Table 5 below. These vessels utilize the gas eduction procedure in order to avoid potential damage to catalysts that could occur with the use of purge gases in the gas displacement procedure.

**Table 5 – Vessels Utilizing Gas Eduction**

HCU	Hydrocracker Unit
HTU1	Hydrotreater No. 1
HTU2	Hydrotreater No. 2
HTU3	Hydrotreater No. 3

	<b>SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT</b> <i>ENGINEERING &amp; COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	<b>PAGES:</b> 6	<b>PAGE:</b> 5
		<b>A/N:</b> 474117	<b>DATE:</b> 2/10/2010
		<b>PROCESSED BY:</b> Meredith Hankins	<b>CHECKED BY:</b>

HTU4	Hydrotreater No. 4
CRU2	Catalytic Reforming Unit No. 2
CRU3	Catalytic Reforming Unit No. 3

Once it is determined that the initial depressurization has reduced the vessel pressure below 5psig, the eduction process is used to remove any remaining vapors to the flare. The vessels are not opened to the atmosphere until it is confirmed that the vessel pressure is below 5 psig and the LEL is below 10%.

**CONCLUSIONS AND RECOMMENDATIONS:**

Tesoro's compliance plan for Rule 1123 includes all of the necessary information required by 1123(b)(2). The plan provides for the maximum feasible control of emissions by sending all turnaround vapors to the flare gas recovery system (FGRS) or directly to the flare. The plan also complies with the flare minimization goals of Rule 1118 (and the "maximum feasible control" mandate set by Rule 1123) by sending turnaround vapors to the FGRS by default, and only sending vapors directly to the flare when the recovery capacity of the FGRS is exceeded or the vent gas composition is incompatible with the FGRS.

As per Rule 1123(b)(3), plans should be approved if they provide for maximum feasible control of emissions of displaced or educed organic gases without causing damage to equipment, malfunction of pollution control or safety devices, or violations of safety regulations. Tesoro's compliance plan dated 12/18/09 meets all of the requirements laid out by 1123(b)(3). Therefore approval of Tesoro's Rule 1123 Refinery Process Turnarounds Compliance Plan is recommended subject to the following conditions:

1. Refinery process turnarounds shall be conducted in accordance with the attached plan dated December 2009, unless otherwise specified below.
2. During refinery process turnaround, the vapors released from the vessel shall not vent to the atmosphere at any time unless the vessel has been depressurized to below 5 psig, or is within 10 percent above the minimum gauge pressure at which the vapors can be collected, whichever is lower, and has met all the requirements in Condition No. 3 and 4 below.
3. To depressurize vessels pursuant to Condition No. 2, the vapors released from the vessel shall be recovered by (i) the vapor recovery system (VR system) or (ii) the flare gas recovery system (FGR system). The vapors released from the vessels may be directed to a flare provided that all flares have been operated in accordance with flaring minimization procedures pursuant to Rule 1118(c)(3) and (c)(4).
4. If inert gases are used for refinery process turnaround, the operator shall comply with all of the following requirements:

	<b>SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT</b> <i>ENGINEERING &amp; COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	<b>PAGES:</b> 6	<b>PAGE:</b> 6
		<b>A/N:</b> 474117	<b>DATE:</b> 2/10/2010
		<b>PROCESSED BY:</b> Meredith Hankins	<b>CHECKED BY:</b>

- (A) Prior to introducing inert gases into the vessel, the operator shall initially depressurize the vessel in accordance to Condition No. 2 and 3.
- (B) After introducing inert gases into the vessel, the vapors released from the vessel shall be recovered by the VR or FGR systems.
- (C) Condition No. 4B above shall not apply if the facility operator can demonstrate that recovering the vapors would result in: (i) equipment damage due to incompatibility with recovery system equipment or with refinery fuel gas systems, (ii) malfunction of pollution control equipment or safety devices, or (iii) violations of safety regulations. The vapors are permitted to be routed directly to the flare if condition (i), (ii), or (iii) is met and provided that all flares have been operated in accordance with flaring minimization procedures pursuant to Rule 1118(c)(3) and (c)(4).

5. The operator shall keep records of each refinery process unit turnaround, in a manner approved by the AQMD, for the following items:
- The date the unit was shut down.
  - The time, date, and hydrocarbon concentration measured when the vapors from the vessel were first discharged into the atmosphere.
  - The approximate amount of hydrocarbons emitted into the atmosphere.
  - Records to demonstrate that condition No. 4C is applicable

The records shall be kept for at least five years and made available for District inspection upon request.