California Environmental Protection Agency

Air Resources Board

STAFF REPORT:

INITIAL STATEMENT OF REASONS FOR PROPOSED AMENDMENTS TO THE LIST OF EQUIPMENT DEFECTS THAT SUBSTANTIALLY IMPAIR THE EFFECTIVENESS OF GASOLINE VAPOR RECOVERY SYSTEMS

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Acknowledgments

ARB staff extends their appreciation to the members of California Air Pollution Control Officers Association (CAPCOA) Vapor Recovery Committee for providing multiple suggestions on improvements to the enhanced vapor recovery program as well as technical assistance. We thank all the air pollution control districts who provided their input to the Vapor Recovery Equipment Defects (VRED) List Update. We appreciate the expertise shared by ARB's Corey Bock from the Economic Studies Section; Sylvia Oey from the Southern California SIP Section; Gabrielle Ruiz of the Emission Inventory Systems Section; and Julie Cress of the Office of Legal Affairs; the Board Administration and Regulatory Coordination Unit.

This report and proposed amendments to the Vapor Recovery Equipment Defects List incorporated by reference into the California Code of Regulations, section 94006 were developed by the following Air Resources Board Staff:

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EXECUTIVE SUMMARY

The Air Resources Board (ARB or Board) is proposing amendments to the Vapor Recovery Equipment Defects (VRED) List incorporated by reference in California Code of Regulations (Cal. Code Regs.), title 17, section 94006(b). The Executive Officer of ARB is required to identify and list those defects in the equipment that substantially impair the effectiveness of the vapor recovery system to collect vehicle gasoline refueling emissions (Health & Safety Code section 41960.2(c)(1)).

The Executive Officer has identified and listed the substantially impairing defects in the VRED List incorporated by reference in Cal. Code Regs., title 17, section 94006(b). The regulation as stated in Cal. Code Regs., title 17, section 94006(a) requires any defect that meets the following criteria to be considered substantial:

1. The defect did not exist when the system was certified;
2. The excess emissions associated with the defect have the potential to degrade fueling point or system efficiency by at least five percent; and
3. A field verification procedure exists to identify the defect.

In the VRED List, the Executive Officer has identified conditions in vapor recovery equipment components which are not present during normal operation of vapor recovery systems, allow excess emissions, and can be readily verified. Section 41960.2(c)(2) of the Health and Safety Code requires the Executive Officer to periodically review the VRED List to determine if it needs to be updated to reflect changes in equipment technology and performance.

An air pollution control district (APCD or district) or an air quality management district (AQMD or district) is responsible for inspecting local gasoline dispensing facilities (GDF) and enforcing vapor recovery violations involving equipment defects and performance test failures (Health & Saf. Code §§ 40752 and 41960.2(d) - (e)). When a district determines that a component contains a defect specified in the VRED List, the district shall mark the component "Out of Order." No person shall use or permit the use of the component until the component has been repaired, replaced, or adjusted, as necessary, and the district has reinspected the component or has authorized use of the component pending reinspection.

The specific proposals to update the VRED List can be placed into three categories: 1) inclusion of defects for equipment certified in Executive Orders (EOs) signed since the last amendment to the VRED List; 2) new defect verification procedures; and 3) editorial changes to remove minor inconsistencies and improve clarity. ARB staff believes that amending the VRED List will enhance the ability to identify, and repair or replace, those defects that could significantly affect the effectiveness of gasoline vapor recovery systems.

Local air district staffs, manufacturers' representatives, and private owner/operators representing gasoline dispensing facilities (GDF) have collaborated with ARB staff on the development of this update to the VRED List. The local districts have provided valuable suggestions regarding technical information, identification of correct verification procedures, and clarification of listed defects.

The proposed amendments to the VRED List are based on two goals. The first is to provide clear direction concerning proper equipment operation and maintenance to the owners and operators of the dispensing facilities. The second is to provide clear direction to the local districts concerning inspections and defect detection at dispensing facilities.

The proposed amendments affect a multitude of stakeholders. These include the vapor recovery equipment manufacturers, gasoline marketers who purchase this equipment, contractors who install and maintain vapor recovery systems, and the inspectors at the districts who enforce vapor recovery rules. In addition, California certified systems are required by many other states and countries.

The emission reductions associated with the vapor recovery program have already been accounted for in the 1994 State Implementation Plan (SIP). However, consistency between defects listed in EOs and those in VRED tables will enhance compliance by GDF operators and enforcement by the districts, making it more likely that the committed reductions will, in fact, occur.

Staff recommends that ARB Executive Officer approve the proposed amendments to the VRED List

I. INTRODUCTION AND BACKGROUND

A. Introduction

1. Overview

This Initial Statement of Reasons (ISOR or Staff Report) contains ARB staff's proposal for amending the VRED List incorporated by reference in Cal. Code Regs., title 17, section 94006(b). The VRED List is a compilation of conditions which substantially impair the effectiveness of vapor recovery systems used to control motor vehicle gasoline refueling emissions. This ISOR contains the following information:

- Background and rationale for the proposed amendments
- Description of the public process
- Need for emission control
- Description of the proposed amendments
- Environmental impacts
- Economic impacts
- Future activities

2. History

In 1982, ARB compiled a list of 12 substantially impairing defects for vapor recovery equipment and incorporated the list into Cal. Code Regs., title 17, section 94006. These defects applied generally to all vapor recovery systems, regardless of type or manufacturer. Since 1982, the Executive Officer has certified vapor recovery equipment and described the significant defects associated with each of the systems in the EO certifying the system. The technology and design of the vapor recovery systems have changed significantly since the original list was adopted. The first amended VRED List, adopted September 23, 2002, was required to have regular and periodic updates.

Changes to EOs are now more rapid and defects are more system specific. Although certified vapor recovery systems operate without any defects for months at a time, updating the list will enhance compliance efforts by GDF operators and district enforcement personnel.

ARB must identify and list equipment defects that substantially impair the effectiveness of these systems and periodically update the list as appropriate (Health & Saf. Code §41960.2(c)). Each listed defect results in the generation of excess smog-forming hydrocarbon (HC) emissions during the vehicle refueling process. Furthermore, the districts are required to remove from service all equipment that has been determined to contain a listed defect or is affected by defective equipment.

B. Background

In 2002, the Board adopted criteria to define what constitutes a defect "substantially impairing the effectiveness" of vapor recovery equipment used in vehicle gasoline refueling operations. The criteria are:

1. The defect did not exist when the system was certified;
2. The excess emissions associated with the defect have the potential to degrade fueling point or system efficiency by at least five percent; and
3. A field verification procedure exists to identify the defect.

Staff reviews each EO in order to identify all possible defects which may substantially impair the effectiveness of the systems in collecting gasoline vapors for inclusion in the VRED List incorporated by reference into Cal. Code Regs., title 17, section 94006(b). The objective is to consolidate all of the substantial defects into one list in order to enhance compliance and enforcement, rather than an incomplete list plus numerous system EOs. In 2005, the VRED List was amended to correct a variety of minor inconsistencies, provide clarification, and make editorial-type changes. In 2008, the VRED List was amended to add defects for systems approved in EOs and remove EOs with equipment no longer allowed to be used in California.

The current proposed changes to the VRED List from this latest review include some of the suggestions that were discussed at several California Air Pollution Control Officers Association (CAPCOA) Vapor Recovery Committee meetings and in a January 10, 2011 public workshop. This Committee, comprised of air district personnel, meets quarterly with ARB staff on vapor recovery issues. The suggestions included adding defects for systems approved in EOs since the last amendment to the VRED List, new defect verification procedures, and amendments to correct a variety of minor inconsistencies, provide clarification, and editorial-type changes. This will enable both the district inspectors and GDF maintenance personnel to use their time more efficiently while inspecting GDFs. These changes were fully supported by CAPCOA and during the public workshop.

The 2011 proposed VRED List, as amended, is presented as Appendix 2 of this document, with proposed amendments shown in strikethrough for deletions and underline for additions. A comprehensive and complete description of each change is provided in Section III.B., Proposed Changes.

1. Legal Authority

In 1999, the legislature enacted Assembly Bill 1164. It requires the Executive Officer to identify and list equipment defects in systems for the control of gasoline vapors resulting from motor vehicle refueling operations that substantially impair the effectiveness of the systems in reducing air contaminants. This became known as the VRED List. Assembly Bill 1164 also required the Executive Officer to conduct a public workshop on or before January 1, 2001 and at least once every three years thereafter to determine whether a list update is necessary to reflect changes in equipment technology or performance (Health & Saf. Code §41960.2(c)(2)).

The intent of AB 1164 was to focus enforcement efforts for gasoline vapor control systems on significant defects and to achieve more uniform enforcement of vapor recovery requirements. Updating the VRED List provides everyone involved in motor

vehicle refueling vapor recovery with more accurate and current information regarding vapor recovery equipment defects.

2. Regulatory History

Gasoline vapor recovery systems have been used in California to control smog-forming reactive organic gases (ROG), and specifically HC emissions, for over thirty years. The feasibility of the first vapor recovery systems was investigated at the district level, particularly in the San Diego and Bay Area Districts, in the early 1970s. State law enacted in 1975 requires the Executive Officer to "adopt procedures for determining the compliance of any system designed for the control of gasoline vapor emissions during gasoline marketing operations, including storage and transfer operations, with performance standards that are reasonable and necessary to achieve or maintain any applicable ambient air quality standard (Health & Saf. Code § 41954(a)).

Under State law, the Executive Officer is directed to certify gasoline vapor recovery systems that meet minimum standards (Health & Saf. Code § 41954(c)). To comply with State law, the Board adopted the certification and test procedures found in Cal. Code Regs, title 17, section 94000 et seq. Additionally, State law requires the Executive Officer to identify and list defects that substantially impair the effectiveness of the system (Health & Saf. Code §41960.2(c)(1)). The VRED List, incorporated into Cal. Code Regs, title 17, section 94006(b) lists those defects.

After certification, a system may be installed at a GDF anywhere in the State. The local air districts are charged with inspecting GDFs to ensure the system is operating as certified. Part of the inspection procedure is to verify that the system is being operated free from the equipment defects specified in the List.

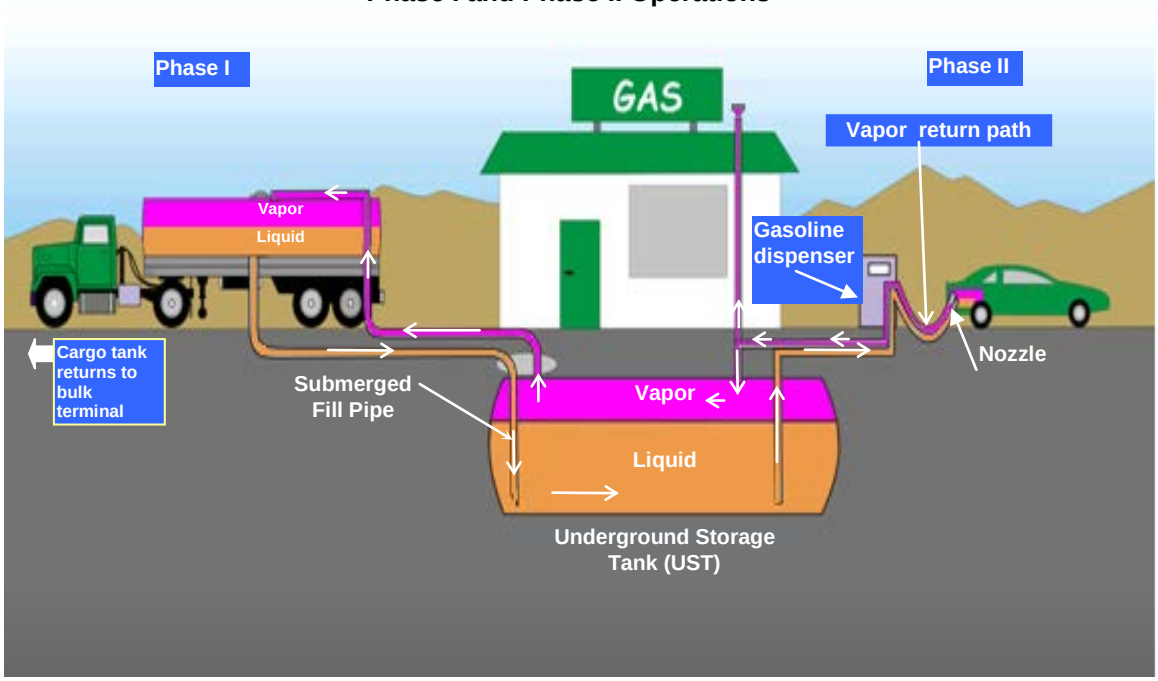
Because each gasoline transfer leads to displaced ROG and toxic air contaminant (TAC) emissions the use of efficient vapor recovery equipment is essential throughout the gasoline marketing chain. Vapor recovery systems are divided into separate but dependent parts that are independently certified, as described further in this section.

3. Phase I Vapor Recovery

Phase I vapor recovery is applied to gasoline transfer operations involving cargo tank trucks for the control of ROG and emissions. The first transfer occurs when the cargo tank is filled with petroleum product at the loading rack of a refinery terminal or a bulk plant. While the cargo tank is filled, gasoline vapor from the cargo tank is recovered.

As illustrated in Figure 1, Phase I vapor recovery also includes the transfer from the cargo tank to GDF storage tanks. During the fuel delivery, any possible emissions are controlled by diverting the vapor from the storage tank back into the unloading tanker compartment. Phase I vapor recovery has been required throughout California since the early 1970's.

Figure 1
Phase I and Phase II Operations



4. Phase II Vapor Recovery

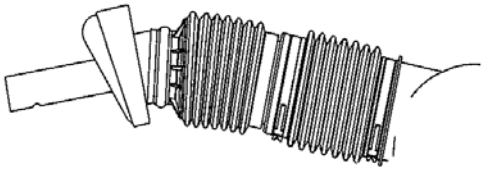
Phase II vapor recovery controls ROG emissions resulting from gasoline transfer operations at GDFs to motor vehicles. Phase II systems were originally a means of an ozone precursor control. These systems became more widely used as a measure to reduce public exposure to benzene, a known TAC. Phase II vapor recovery equipment is routinely operated by the public to refuel vehicles. The two main types of Phase II vapor recovery systems are “balance” and “vacuum assist.” Both these systems include processors to manage vapor space pressure in GDF underground storage tanks (UST) to minimize pressure related fugitive losses.

The balance systems can be identified by the long bellows/boot located on and around the nozzle spout (See Figure 2). This type of vapor recovery system operates on the principle of positive displacement during refueling. Vacuum in the UST is created when fuel is removed, while at the same time pressure is created in the vehicle fuel tank by the incoming liquid gasoline. Therefore, saturated vapor is forced out of the vehicle fuel tank and to a certain degree pulled through the nozzle, then follows the vapor passage into the storage tank. For effective operation, the end of the bellows (the nozzle face seal or boot seal) must make a good seal with the vehicle fill neck opening when the nozzle is dispensing fuel into the vehicles gas tank. This ensures that the gasoline vapors pushed out of the vehicle fuel tank are routed back through the nozzle to the GDF UST vapor space during refueling. This is sometimes referred to as a “passive” system.

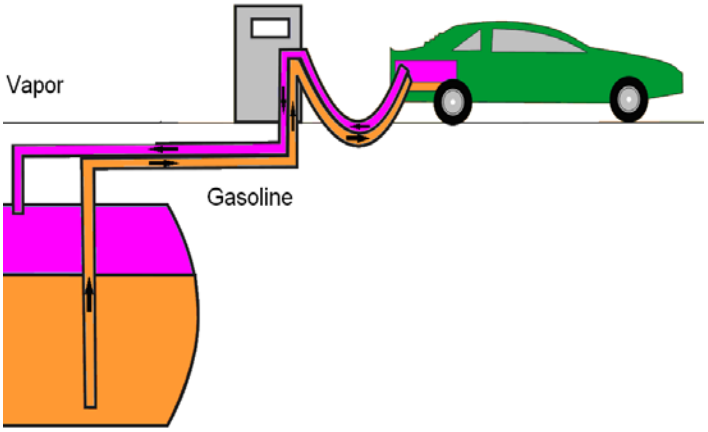
Vacuum assist systems, in contrast, require a vacuum generating device to collect gasoline vapors from the vehicle fuel tank during refueling and route them from nozzle to GDF storage tank. The bellows/boot on these assist systems is usually much shorter (See Figure 2).

Figure 2
Typical Balance & Vacuum Assist Systems

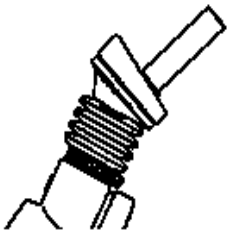
Balance System



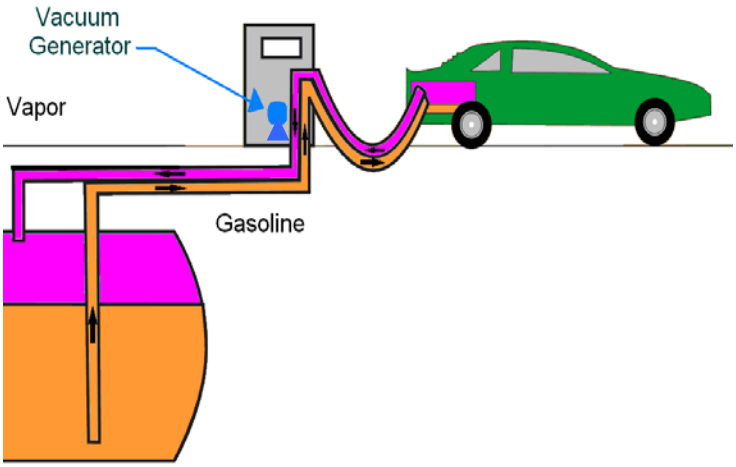
Nozzle Bellows Boot



Vacuum Assist System



Nozzle Bellows Boot



5. Onboard Refueling Vapor Recovery (ORVR)

Vehicle Onboard Refueling Vapor Recovery (ORVR) was promulgated by United States Environmental Protection Agency in 1994. ORVR systems create a seal in the vehicle fill pipe during dispensing to route vapors, which are normally displaced through the fill pipe, to an onboard canister containing activated carbon. During normal driving, the ORVR system uses engine manifold vacuum to desorb the vapors from the carbon and

meter them to the intake of the engine fuel system. ORVR controls were phased in beginning with 1998 model year passenger vehicles and since 2006 model year are included on all passenger, light duty and medium duty vehicles.

6. Enhanced Vapor Recovery (EVR)

In 2000, the ARB amended nine vapor recovery procedures and adopted five new test procedures to support new standards for certification of enhanced vapor recovery (EVR) systems that operate at gasoline dispensing facilities. For certification the EVR systems are required to be compatible with ORVR equipped vehicles. In addition, EVR introduced the use of the In-Station Diagnostics (ISD) which can alert the operator to vapor recovery equipment problems should they occur. Also introduced were two new nozzle standards and one amended nozzle standard. These were Liquid Retention and Dripless standards as well as a Spillage standard respectively. With the exception of one section of CP-201, the amended regulations were approved on March 20, 2001 by the Office of Administrative Law and became effective May 31, 2001. The remaining section was approved September 6, 2001 and became effective October 6, 2001.

C. Public Process

1. Public Workshop

ARB conducted a public workshop on January 10, 2011, in Sacramento to review the current VRED List and to determine the need for an update. In accordance with the three-year legislative requirement previously discussed in section I.B.1., the purpose of this meeting was to determine whether the VRED List, as amended June 17, 2008, needed to be updated. An update was determined to be necessary and modifications to the VRED List were proposed. Participants also discussed possible defects not currently specified. Attendees included representatives from air districts, equipment manufacturers, GDF owner/operators and ARB.

After introductions, a brief presentation covered the following topics: equipment defect history, ARB defect authority, ARB‘s requirements, defect determination criteria, potential list changes, requests for additional changes, and future action. A handout of a draft proposal of changes to the VRED List was then discussed with reasons for each change explained and questions answered by ARB staff.

The proposed changes to the VRED List, including removal of EOs for equipment no longer allowed to be used in California, were fully supported. Additional defect verification procedures were proposed. The suggestions included amendments to correct a variety of minor inconsistencies, provide clarification, make editorial-type changes, and to add defects for systems approved in EOs since the last VRED List amendment. This will enable both the district inspectors and maintenance personnel to use their time more efficiently while inspecting GDFs.

ARB staff posted the most recent draft of the list on ARB’s Internet website (at the following website address: http://www.arb.ca.gov/vapor/vred/vred.htm) to allow all stakeholders, whether attending the workshop or not, to comment.

2. CAPCOA Meetings

In addition to the workshop, ARB staff worked closely with local air district staff. Two meetings affecting the VRED List update were held with district staff serving on the CAPCOA Vapor Recovery Committee.

On October 6, 2010, ARB staff presented a preliminary update of the proposed VRED List to CAPCOA's Vapor Recovery Committee. ARB staff communicated that unless justification could be demonstrated, no defects would be removed in this update and staff would be adding in only the defects for systems approved in EOs since the last amendment.

On January 19, 2011, ARB staff presented an update of the proposed VRED List to CAPCOA's Vapor Recovery Committee. Preliminary comments received during the January 10, 2011 Public Workshop were discussed. ARB staff provided responses and resolution was reached for the comments raised.

3. Internet Availability

Beginning in the first quarter of 2003, proposed amendments to the VRED List have been made available on ARB's Internet website at the following website address: http://www.arb.ca.gov/vapor/vred/vred.htm. With each set of changes, a new draft of the VRED List was posted and subscribers to the Vapor Recovery List Server were notified. Information regarding the public workshop and other meetings was also posted. To help identify changes, strikethrough or underline notation was used for deletions, or additions, respectively.

II. NEED FOR EMISSION CONTROL

A. Background

Significant strides have been made in improving California's air quality. Nonetheless, most regions in California continue to exceed one or more health-based State or Federal ambient air quality standards. For example, all but the North Coast, the State's northern-most counties, and Lake County exceed the State ozone standard, and all of the State's major metropolitan areas except those in the San Francisco Bay Area exceed the less stringent federal ozone standard.

Created by the photochemical reaction of ROG and oxides of nitrogen (NO_X), ozone causes harmful respiratory effects including lung damage, chest pain, coughing, and shortness of breath. Ozone is particularly harmful to children, the elderly, athletes, and persons with compromised respiratory systems. Environmental effects of ozone exposure include substantial damage to crops, materials, and other structures.

Emission controls have been placed on both mobile and stationary sources of ROG and NO_X. Gasoline vapor recovery collection systems for petroleum marketing operations are among the earliest and most successful measures adopted for ROG control. The vapor recovery requirement has been in place in the State's more populous areas since 1979 as a result of commitments made in the 1979 State Implementation Plan (SIP),

which identified “Phase II” (service station) vapor recovery as a control needed to meet federal ozone standards. All remaining areas adopted Phase II vapor recovery controls following ARB’s 1988 adoption of its Benzene Airborne Toxic Control Measure (ATCM) for Retail Service Stations. The EVR program and the VRED List provide and reinforce these reductions.

Even with current controls, petroleum product transfers at GDFs result in significant emissions. The annual average statewide emissions from at least 10,000 GDFs are 40 tons per day (tpd) of ROG. In the absence of the Phase I and Phase II controls an additional 300 tpd would be released into the atmosphere. A concise list of defects expedites the recognition and removal of faulty vapor recovery equipment, thereby reducing ground-level ozone, benzene and other HC levels by a concomitant amount. California’s residents will benefit from improved air quality with the reduced ROG emissions and formation of ground-level ozone (smog), and lower exposure to known TAC. Replacement of defective equipment will prevent the release of excess gasoline vapor.

B. Impact on the State Implementation Plan for Ozone

Emission reductions from existing vapor recovery regulations are reflected in the baseline inventories used in the 1994 SIP for Ozone, and subsequent attainment demonstration plans submitted to U.S. EPA as revisions to California’s SIP. The U.S. EPA approved the 1994 SIP in September 1996 (62 Federal Register 1150-1201 (January 8, 1997)). The SIP identifies the measures needed to bring the State’s nonattainment areas into attainment with the federal standards, such as State measures to control emissions from motor vehicles and fuels, consumer products and pesticide usage; local measures for stationary and area sources; and federal measures for sources under exclusive or partial federal control.

The emissions reductions achieved by the vapor recovery program are reflected in the current baseline emission inventory and are not being amended. The proposed amendments to the VRED List are needed to ensure compliance and enhance enforcement of existing vapor recovery rules. Adoption of the proposed VRED List will ensure that the emission reduction commitments in the SIP are achieved in practice.

III. SUMMARY OF RECOMMENDED ACTIONS

A. Introduction

This section describes ARB staff’s proposal to amend the VRED List, incorporated by reference in Cal. Code Regs, title 17, section 94006(b).

In 1982, a list of substantially impairing equipment defects was first set forth in Cal. Code Regs, title 17, section 94006. Subsequently, identified defects were specified in individual EOs certifying the systems. As directed by Assembly Bill 1164, the Executive Officer assembled all substantially impairing defects from these EOs for inclusion into the VRED List, adopted September 23, 2002; amended September 17, 2005 and last amended June 17, 2008.

B. Proposed Changes

The specific proposals to update the VRED List can be placed into three categories: 1) inclusion of defects for equipment certified in EOs signed since the last amendment to the VRED List; 2) new defect verification procedures (all verification procedures being added are currently adopted test methods called out in each EO); and 3) editorial changes to remove minor inconsistencies and improve clarity. All changes are underlined for additions and strikethrough for deletions in the proposed VRED List in Appendix 2. Each type of VRED List change is described by category in the following sections.

The proposed regulatory changes to the VRED List deal only with Phase II EVR systems at GDFs, and not terminals or bulk plants. No Phase II EVR Aboveground Storage Tank (AST) EOs have been issued to date, therefore, the effective and operating dates for AST EVR systems has been extended to January 1, 2012. There also is no certified EVR equipment for bulk plants, therefore, the effective and operating dates for bulk plants has been extended to April 1, 2015. Given these two situations, no pre-EVR EOs are being removed from the VRED list until such time as there is certified EVR equipment for these systems. As of the publication of this report, there have been no requests to remove those EOs. The public comment period for this report on the proposed amendments to the VRED List closes on August 3, 2011.

Defining each defective condition within each EO table is necessary to provide clarity and greater understanding. Each vapor recovery system is made up of equipment that is universal and unique. As such there are common equipment defects for different EOs. There are also differences between manufacturer's equipment, such as nozzles and processors, and what constitutes a defect in one manufacturer's equipment does not always manifest defects in the same way as with another manufacturer's equipment. One nozzle may only need a small amount of tears or rips to have the vapor recovery system lose efficiency, while another manufacturer's system efficiency is not affected by tears or rips in their nozzle.

A discussion of each new equipment defect being introduced to the List follows.

1. Inclusion of Defects for Equipment Certified in EOs Signed Since the Last Amendment to the VRED List

Three new EOs (VR-204, VR-207 and VR-208 series) for systems that may have identifiable substantially impairing defects for specific equipment have been issued since the last amendment of the VRED List. Staff is proposing to add a VRED table for each of these systems, and list appropriate equipment, defects and verification procedures.

Staff proposes amendments to three Phase II EVR EOs in the current VRED List (VR-201, VR-202, and VR-203 series.) These amendments will reflect changes that are

equipment defect related which were identified in EO versions issued since the VRED List was last updated.

a. Nozzles

Rips, tears, cuts, holes,

Damage such as rips, tears, and holes, to components of a nozzle known as a boot, bellows, convolutions, vapor collection sleeve, face seal or faceplate, compromise the seal between the nozzle and the vehicle fillneck opening. Damage to these components of the nozzles results in a substantially impairing defect because gasoline vapor is allowed to escape to atmosphere before the system can capture it.

Insertion Interlock Mechanism Failure

All balance type nozzles are equipped with insertion interlocks. Insertion interlocks are an integral part of bellows-equipped nozzles and they prohibit the dispensing of fuel unless the bellows is compressed. This in turn helps ensure that the nozzle faceplate makes a seal with the vehicle fill neck opening prior to gasoline being dispensed. Failure of the insertion interlock mechanism can result in the dispensing of fuel into a vehicle fillneck without the proper seal being established. This can result in gasoline vapors escaping to the atmosphere during fueling or the accidental discharge of liquid gasoline if the nozzle trigger is engaged prior to the nozzle being inserted into the vehicle fillneck, thus substantially impairing the effectiveness of the system.

Defective Nozzle Vapor Valve

Balance and vacuum assist vapor recovery nozzles are equipped with internal vapor valves. The internal vapor valve on a balance nozzle usually opens as the nozzle is inserted into the vehicle fillneck opening allowing vapor to flow through the nozzle and back into the UST. The internal vapor valve on vacuum assist nozzles, and some balance nozzles opens as fueling is initiated by squeezing the nozzle trigger. When a balance nozzle is removed from the vehicle fillneck the internal vapor valve closes, preventing the captured vapor from escaping to atmosphere. This internal vapor valve closes on a vacuum assist when the trigger is released or the automatic shutoff activates the closure of the internal vapor valve. The internal vapor valves have an allowable leak rate that when exceeded can result in the gasoline storage tanks venting vapors to the atmosphere through the nozzle thereby substantially impairing the effectiveness of the system.

b. Hoses

Liquid in the Vapor Path

Standard coaxial hoses consist of an inner hose though which gasoline flows and an outer hose that transfers vapors from the vehicle back to the gasoline storage tanks. Standard coaxial nozzles are required on all balance type vapor recovery systems and a few vacuum assist type systems. The design of the hose provides a large unrestricted path for vapors to flow from the nozzle faceplate/vehicle fillneck interface back to the

storage tank. Accumulated liquid in the vapor path of a standard coaxial hose hinders the return of vapor through the hose during refueling events. Instead of returning to the storage tank vapors escape to the atmosphere thereby substantially impairing the effectiveness of the system.

Any Visible Opening

Any visible hole, rip, or tear in a standard coaxial hose, compromises the vapor integrity of the overall Phase II vapor recovery system by allowing vapors to escape directly to the atmosphere, substantially impairing the effectiveness of the system.

c. Vapor Return Lines

Vapor return lines provide a pathway for vapors to flow between the nozzles and the gasoline storage tanks. Through these lines gasoline vapors are contained and transferred. Backpressure or resistance to flow in these lines inhibits a vapor recovery system's ability to effectively collect gasoline vapors. When the backpressure exceeds the limits specified, the vapor recovery efficiency of the system is substantially impaired. When the identified defect is found in the VRED List equipment, the defect determination applies to all affected interrelated systems (which may include all systems at the motor vehicle fueling operation.)

d. Processor, Thermal Oxidizer, Vapor Polisher, Clean Air Separator (CAS)

Vapor recovery systems use processors, thermal oxidizers, vapor polishers, or clean air separators (CAS) to contain and process the collected vapors from vehicle refueling operations. When one of these components is: inoperative; fails to activate when UST pressure reaches a specified limit; is not powered on; or does not maintain leak integrity, the resulting fugitive emissions are lost to the atmosphere thereby substantially impairing system effectiveness. When the identified defect is found in the VRED List equipment, the defect determination applies to all affected interrelated systems (which may include all systems at the motor vehicle fueling operation).

e. Ball Valves

Staff proposes new wording to clarify that ball valves are in a defect condition when they are not in the proper operating configuration as shown in Exhibit 2 'System Specifications' of each EO listed in a table. This will allow staff to use the same verbiage in each table for this defect and it will replace the prior confusion over the previous description of the defect. This defect was added due to the fact that if any in-line ball valve is closed during dispensing, no vapor recovery takes place. When the identified defect is found listed in the VRED List equipment, the defect determination applies to all affected interrelated systems (which may include all systems at the motor vehicle fueling operation.)

2. New Defect Verification Procedures

As VRED tables have been added for new EOs, the verification procedures need to be updated to reflect these changes. Staff proposes to add nineteen (19) currently adopted verification procedures to the amended or added tables, and one typographical correction to an existing verification procedure. A verification procedure is necessary to confirm that the defective condition exists. All verification procedures being added are currently adopted test methods/procedures specified in each EO. Defect identification methods are specified in the verification procedure column of the EO tables, as well as, in the last table of the VRED List, 'Defect Identification Methods Specified in the Verification Procedure Column' need to be updated.

The last page of the VRED List is to be updated to reflect all verification procedures called out in the tables. The defect tables for all six Phase II EVR systems (VR-201, 202, 203, 204, 207 and 208 series) were updated to give the title of the verification procedure in addition to the Exhibit number listed in that EO.

IV. AIR QUALITY, ENVIRONMENTAL AND ECONOMIC IMPACTS

A. Air Quality and Environmental Impacts

1. Summary of Environmental Impacts

This section contains ARB staff's assessment of the potential environmental impacts that would result from amending the proposed VRED List. Both the California Environmental Quality Act and Board policy require the Executive Officer to consider the potential adverse environmental impacts of proposed regulations. ARB staff evaluated the potential environmental impacts of the amendments, including impact on ground-level ozone, particulate matter, toxicity, global warming, stratospheric ozone depletion, water quality, and solid waste disposal. ARB staff also evaluated the impact on the emission reduction commitments contained in the 1994 SIP for ozone. In addition, the Executive Officer will respond in writing to all significant environmental points raised by the public during the public review period or at the hearing. These responses will be available prior to final adoption of the amendments and will be set forth in the Final Statement of Reasons for the modifications to the VRED List.

A concise list of defects should expedite the recognition and removal of faulty vapor recovery equipment, thereby reducing ground-level ozone, benzene, and other HC levels by a concomitant amount. The citizens of California will benefit from improved air quality with the reduced ROG emissions and formation of ground-level ozone (smog), and lower exposure to a known TAC. A greater understanding of the enforcement of the vapor recovery regulations may reduce the need for more stringent standards in the future, thereby lowering future compliance costs to California industries. Replacement of defective equipment will prevent the release of excess gasoline vapor.

ARB staff found that the proposed amendments should not result in an increase or decrease in excess emissions. Thus, no adverse environmental impacts are expected

to result from the proposed amendments to the VRED List. Because no potential adverse impacts are expected, the focus of the following analysis will be on benefits.

2. Legal Requirements for Assessing the Environmental Impacts

Section 21159 of the Public Resources Code (Analysis of Methods of Compliance) requires that the environmental impact analysis conducted by ARB for new regulatory requirements include the following:

- an analysis of the reasonably foreseeable environmental impacts of the methods of compliance (Section IV.A.3.);
- an analysis of reasonably foreseeable feasible mitigation measures (Section IV.A.3.f.) and,
- an analysis of reasonably foreseeable alternative means of compliance with the rule or regulation (Section IV.C.1.).

3. Potential Environmental Impacts

a. Impact on Ground-Level Ozone and Water Quality

The proposed amendments would have a minimal to slightly beneficial impact on ground level ozone and water quality. The amendments being made to the VRED List are currently contained in the existing regulatory provision or in EOs certifying vapor recovery systems, and as such are already enforceable. By clarifying the VRED List, enforcement should be strengthened and compliance should become less difficult.

Consistent enforcement may help identify components with short lifecycles and discourage their use. This should have some effect in the replacement of inferior products and provide manufacturers with an incentive to raise quality. Improved equipment, through increased compliance and stronger enforcement, should decrease emissions.

b. Impact On Global Warming

Staff evaluated climate change considerations of the proposed regulation. ROG can absorb infrared radiation, and the more complex a ROG is, the greater its ability to absorb infrared radiation and contribute to global warming. Unlike oxides of nitrogen, ROG generally do not initiate climate responses of the opposite sign (i.e., they are generally net warmers). However, ROG have the added complication that there are many different types with different behaviors in the atmosphere, making quantifying their warming impact difficult. ROG influence climate through indirect effects via their production of secondary organic aerosols and their involvement in photochemistry (i.e., production of ozone, and in the prolonging the life of methane in the atmosphere, although the effect varies depending on local air quality). Typically, the indirect effect is the dominant path by which ROG contribute to global warming. Overall, strategies for reducing ROG emissions are beneficial for climate change. The Intergovernmental Panel on Climate Change has reported global warming potentials for a relative small set of ROG species, so it is not possible to quantify the exact climate change benefit of this regulation. However, qualitatively reducing ROG emissions as expected will help alleviate climate change related warming.

c. Impact on Particulate Matter

The proposed amendments are not likely to cause an increase in the particulate matter emissions or formation of secondary organic aerosols. Secondary organic aerosols are usually formed from the photo-oxidation of organic compounds with carbon numbers equal to seven or more whereas, gasoline vapor typically has a carbon number of less than five.

d. Impact on Toxic Air Contaminants

Any impact the proposed amendments would have on emissions of TACs including benzene should be favorable. This is because the VRED List facilitates enforcement of vapor recovery requirements. In accordance with the requirements of Health and Safety Code section 41960.2(d), Cal. Code Regs, title 17, section 93101(d) states:

> No owner or operator shall use or permit the use of any Phase II system or any component thereof containing a defect identified in title 17, California Code of Regulations, section 94006 [VRED List] until it has been repaired, replaced, or adjusted, as necessary to remove the defect, and, if required under Health and Safety Code section 41960.2, district personnel have reinspected the system or have authorized its use pending reinspection.

The use of improved and better-maintained equipment, with increased compliance and stronger enforcement, should decrease TAC emissions associated with gasoline vehicle refueling.

e. Impact On Solid Waste Disposal

The impact on solid waste disposal should be somewhat favorable at best or minimal at worst. If improved enforcement and increased compliance causes manufacturers to raise product quality and durability, fewer defective parts will make their way into landfills. Manufacturers now reuse parts of many components. With products that are more durable this practice should increase, leading to even less material being discarded.

f. Identify Mitigation Measures and Alternatives

ARB staff has not identified any adverse environmental impact that would result from the proposed amendments. No mitigation measures are necessary.

B. Economic Impacts

1. Background

In general, economic impact analyses are inherently imprecise, especially given the unpredictable behavior of companies in a highly competitive market such as gasoline marketing and distribution. Some projections are necessarily qualitative and based on general observations and facts known about the gasoline marketing and distribution industry. This impacts analysis, therefore, serves to provide a general picture of the economic impacts typical businesses might encounter because of the compliance and

enforcement actions of the proposed amendments. Staff recognizes that individual companies may experience different impacts than projected in this analysis.

Overall, the proposed amendments are not expected to impose significant additional compliance costs on gasoline dispensing equipment manufacturers, component suppliers, or GDFs in California. The Executive Officer acknowledges that as new vapor recovery equipment defects are identified and enforced, facility owners and equipment manufacturers may face additional costs to address those defects. However, any potential additional costs related to repair or correction of defects is not attributable to the proposed collation of the VRED list, but to the prior issuance of Executive Orders, which originally identified the defects.

2. Potential Impact on Business

ARB staff expects no significant adverse impacts on equipment manufacturers' profitability, on employment in California, or on the competitiveness of California businesses.

Proposed updates to the VRED List can be placed into three categories: 1) inclusion of defects for equipment certified in EOs signed since the last amendment to the VRED List; 2) new defect verification procedures; and 3) editorial changes to remove minor inconsistencies and improve clarity. A clearer reference for detection of vapor recovery equipment defects encourages uniform enforcement across the State and provides preventative maintenance guidance for GDF operators. Most GDFs in California are subject to an annual compliance inspection. Better detection of defective equipment may result in cost savings to GDFs because the defective equipment may be replaced while under warranty. Maintenance contractors for service stations may also benefit from better enforcement of the existing regulation due to clarification and manufacturers of complying vapor recovery equipment may increase sales. A greater understanding of the defects for vapor recovery systems will reduce the need for more stringent standards in the future, thereby lowering compliance costs to California operators. Given these projections, ARB staff has determined that adoption of the proposed amendments benefit small businesses.

In accordance with the California Administrative Procedure Act, section 11346.3(b), of the Government Code, the Executive Officer has determined that adoption of the proposed regulatory action should have no impact on the creation or elimination of jobs within California; the creation of new businesses or elimination of existing businesses within California; or the expansion of any business currently doing business in California.

3. Cost to State Agencies and Local Government

The proposed amendments will not create any fiscal impacts or mandates to any local governmental agency or school district whether or not reimbursable by the State pursuant to part 7 (commencing with section 17500), division 4, title 2 of the Government Code, or other non-discretionary savings to local agencies, nor will the proposed amendments create costs or savings to any State agency. Programs are

currently in place to identify possible vapor recovery equipment defects as systems are certified. Resources are also available for completing future reviews and revisions of the list.

C. Evaluation of Alternatives

The alternative to amending the VRED List is to do nothing; which is only viable if it is determined, after public review, that an update to the List is not necessary. To not consider amending the List is not a viable alternative since ARB is required by law to review the VRED List per Health and Safety Code section 41960.2(c) which states:

> On or before January 1, 2001, and at least once every three years thereafter, the list required to be prepared pursuant to paragraph (1) shall be reviewed by the executive officer at a public workshop to determine whether the list requires an update to reflect changes in equipment technology or performance.

The VRED List as amended in 2002, 2005 and 2008 included several items that were discovered by using the VRED List in the field. From this first list a number of successive options have been developed, and evaluated in public and private meetings. The current modified VRED List presented to the Executive Officer for approval is based on these progressive evaluations of options.

No alternative considered by the agency would be more effective in carrying out the purpose for which the regulation is proposed, or would be as effective as and less burdensome to affected private persons than the proposed regulation.

The EVR program is required to achieve the emission reduction goals of the 1994 SIP to meet the Federal Clean Air Act. The VRED list establishes uniform criteria for use in statewide enforcement programs and creates specific criteria that can be used by regulatory agencies and operators to ensure that these systems remain in compliance and realize maximum operating effectiveness. There are no comparable federal regulations that certify gasoline vapor recovery systems for GDFs; however, ARB certification is required by many other states that mandate Phase I or Phase II vapor recovery at GDFs.

V. FUTURE ACTIVITIES

A. AB1164 Requirements

In 1999, Assembly Bill 1164 amended section 41960.2 (c) (2), of the Health and Safety Code to require the Executive Officer of ARB to review Cal. Code Regs, title 17, section 94006 (VRED List) at a public workshop at least once every three years to determine whether a list update is necessary to reflect changes in equipment technology or performance. The Health and Safety Code also authorizes the Executive Officer to initiate public review of the list upon a written request. The request must demonstrate, to the Executive Officer's satisfaction, that such a review is needed. In addition, if the Executive Officer determines that the list should be updated, the update must be

completed within 12 months of the determination. Because of the rapid technological change in vapor recovery equipment, ARB staff anticipates these update requirements will generate changes to the defects listed every three years, if not more often.

B. Executive Orders with Defects Listed

New and amended certifications for vapor recovery systems are expected to continue to be issued. A number of substantially impairing equipment defects identified as systems are certified will need to be added to the VRED List. These new defects, initially specified in each EO, will be examined during a periodic review of the VRED List. Additionally, defects will need to be removed for EO's which have expired. This ensures that the List is kept current.

VI. CONCLUSION

The Executive Officer has identified and listed the substantially impairing defects in the VRED List incorporated by reference in Cal. Code Regs, title 17, section 94006(b). The regulation as stated in Cal. Code Regs, title 17, section 94006(a) requires any defect that meets the following criteria be considered substantial:

1. The defect did not exist when the system was certified;
2. The excess emissions associated with the defect have the potential to degrade fueling point or system efficiency by at least five percent; and
3. A field verification procedure exists to identify the defect.

ARB staff has identified conditions in vapor recovery equipment components that meet the above criteria, and is proposing amendments to the VRED List.

The proposed amendments affect a multitude of stakeholders. These include the vapor recovery equipment manufacturers, gasoline marketers who purchase this equipment, contractors who install and maintain vapor recovery systems, and the inspectors at the districts who enforce vapor recovery rules. In addition, California certified systems are required by many other states and countries. It is important to keep the VRED List current and accurate.

The emission reductions associated with the vapor recovery program have already been accounted for in the 1994 SIP. However, consistency between defects listed in the EOs that certify vapor recovery systems and equipment and those in the VRED tables will enhance compliance by GDF operators and bring uniformity to enforcement by the districts, ensuring that the expected reductions will occur as planned. Therefore, staff recommends that the Executive Officer approve the proposed amendments to the VRED List.

Appendix 1:

Proposed
Regulation Order

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Proposed Regulation Order

Amend California Code of Regulations, title 17, section 94006(b), solely to show the new amendment date of the document incorporated by reference, as follows:

[Note: The proposed amendments are shown in underline to indicate additions and ~~strikethrough~~ to indicate deletions.]

§94006. Defects Substantially Impairing the Effectiveness of Vapor Recovery Systems Used in Motor Vehicle Fueling Operations.

(a) [NO CHANGE]

(b) For the purposes of section 41960.2 of the Health and Safety Code, equipment defects in systems for the control of gasoline vapors resulting from motor vehicle fueling operations which substantially impair the effectiveness of the systems in reducing air contaminants are set forth in the "Vapor Recovery Equipment Defects List" amended on ~~June 17, 2008~~ [insert date] which is incorporated by reference herein.

Note: Authority cited: Sections 39600, 39601 and 41960.2, Health and Safety Code. Reference: Sections 41954 and 41960.2, Health and Safety Code.

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Appendix 2:
Proposed Amendments to the Vapor Recovery Equipment Defects List

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California Environmental Protection Agency

Air Resources Board

Vapor Recovery Equipment Defects List

Adopted: September 23, 2002
Amended: June 22, 2005
Amended: June 17, 2008
Amended: [insert date]

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Vapor Recovery Equipment Defects List
Date of Issuance: ~~June 17, 2008~~ insert date

GVR All Systems/any EO		
equipment	defects	verification procedure
(a) system	(1) any equipment defect which is identified in an Executive Order (EO) certifying a system pursuant to the Certification Procedures incorporated in Section 94011 of Title 17, California Code of Regulations	as set forth in the applicable EO
	(2) absence, improper installation, or disconnection of any component required to be used in the EO(s) that certified the system	direct observation
	(3) installation or use of any uncertified component	direct observation
	(4) dispensing rate greater than ten (10.0) gallons per minute (gpm) or less than the greater of five (5.0) gpm or the limit stated in the EO measured at maximum fuel dispensing	when determined as part of any ARB approved test method or direct measurement for 30 seconds minimum
	(5) Phase I vapor poppet inoperative	direct observation
(b) nozzles	(1) nozzle automatic liquid shutoff mechanisms which malfunction in any manner	EPO No. 26-F-~~1~~/direct observation

NOTE: This DRAFT VRED List includes changes to text that are underlined for additions and struck through for deletions. These marks will be removed after final approval of List.

note: Each defect in the tables in this list has a specific alphanumeric identification. Every identification has three parts: ~~i)~~

i) the Executive Order(EO) number for the table in which the defect appears (or GVR- (general vapor recovery-) for this "All Systems/any EO" page only),~~ ii)~~

ii) a sequential letter for the equipment with which the defect is associated~~, and iii)~~. As the "equipment " column in the table changes the equipment number sequence that is associated with the specific equipment begins again with the letter "(a)".

iii) a sequential number for the defect itself. As the "equipment" column in the table changes, the defect number sequence that is associated with the specific equipment begins again with one ~~(~~"(1)"). The same is true for the equipment letter: at the start of a new table, the first identifying letter associated with the first equipment listed will be "a," the second "b," and so on. The Executive Order number (part i) is comprised of the characters which proceed the literal description of the system.

For example, the identification for the defect above which is written "installation or use of any uncertified component" is "GVR(a)(3)". ~~and the last defect on the next table (page 2) is "G-70-7(d)(1)."~~

Page 15 gives an example of each of these changes:

Part i example: The EO number is comprised of the characters which precede the literal description of the system (VR-203 series VST Phase II EVR System ~~sans~~not including ISD;

Part ii example: A second model of nozzle has been added to that EO therefore nozzles are now lettered as a, b and c (VST , EMCO, and all nozzles).

Part iii example: The verification procedure for checking the insertion interlock mechanism for the VST nozzle is different from what is used for the other nozzles listed in this EO. You will note that the VR-203 table has additions related to this as VR-203(a)(4) and VR-203(b)(4). The remaining nozzle defects were renumbered and placed under the equipment category of 'all nozzles' as those defects are not nozzle specific.

G-70-7 series Hasstech VCP-2 and VCP-2A AST Only		
equipment	defects	verification procedure
(a) system	(1) any fueling point associated with a vapor line disconnected and open to the atmosphere, including all fueling points at the facility if vapor lines are manifolded	direct observation
	(2) system not in compliance with the static pressure decay test criteria*	TP201.3 or equivalent
	(3) any grade of a fueling point not capable of demonstrating an air to liquid ratio compliance with its performance standard	TP201.5 or equivalent
	(4) pressure drop through the system exceeds one-half (0.50) inch water column at sixty cubic feet per hour (60 CFH)	TP201.4 or equivalent
(b) hoses	(1) any coaxial hose with a perforation exceeding one-eighth (0.13) inch diameter	direct measurement/ observation
	(2) any coaxial hose with slits or tears in excess of one-fourth (0.25) inch in length	direct measurement/ observation
(c) processing unit	(1) three consecutive unsuccessful attempts to ignite the incinerator which occur at least two hours after a bulk delivery *	direct measurement/ observation/system monitor observation
	(2) unit does not activate when the system pressure reaches or exceeds two (2.0) inches water column and occurs at least two hours after a bulk delivery*	direct measurement using storage tank pressure device
	(3) emissions which exceed Ringelmann one-half (½) or ten percent (10%) opacity and not attributable to a bulk delivery *	Method 9
	(4) vapor processing unit inoperative *	direct observation
(d) collection unit	(1) vacuum producing device inoperative *	direct observation

* when the identified defect is detected in the listed equipment, the defect determination applies to all affected interrelated systems (which may include all systems at the motor vehicle fueling operation).

G-70-14 series Red Jacket	G-70-17 series Emco Wheaton	G-70-23 series Exxon
G-70-25 series Atlantic Richfield	G-70-33 series Hirt	G-70-36 series OPW
G-70-38 series Texaco	G-70-48 series Mobil	G-70-49 series Union
G-70-52 series Red Jacket, Hirt	G-70-53 series Chevron	G-70-125 series Husky Model V
G-70-134 series EZ-flow rebuilds	G-70-139 series Hirt AST	G-70-170 series EZ-flow rebuilds

equipment	defects	verification procedure
(a) nozzles	(1) any nozzle boot torn in one or more of the following manners: a triangular-shaped or similar tear one-half (0.50) inch or more on any side, or hole one-half (0.50) inch or more in diameter, or slit one (1.0) inch or more in length	direct measurement/ observation
	(2) any faceplate or flexible cone damaged in the following manner: for balance nozzles and for nozzles for aspirator and eductor assist type systems, damage such that the capability to achieve a seal with a fill pipe interface is affected for one-fourth (25%) of the circumference of the faceplate (accumulated)	direct measurement/ observation
	(3) flexible cone damaged in the following manner: for booted type nozzles for vacuum assist-type systems, more than one-fourth (25%) of the flexible cone missing	direct measurement/ observation
	(4) insertion interlock mechanism which will allow dispensing when the bellow is uncompressed	direct observation/ GDF-09
(b) hoses	(1) any coaxial balance hose with 100 ml or more liquid in the vapor path	direct measurement
	(2) any hose with a visible opening	direct observation
(c) processing unit	(1) vapor processing unit inoperative *	direct observation
(d) vapor return lines	(1) pressure drop through the vapor path exceeds by a factor of two or more requirements specified in the Executive Order(s) that certified the system	TP201.4 or equivalent

* When the identified defect is detected in the listed equipment, the defect determination applies to all affected interrelated systems (which may include all systems at the motor vehicle fueling operation).

note: The identification scheme for defects listed in this table is the same three part alphanumeric identification (see page 1) as the other tables. However, the correct Executive Order number will be the one for the specific system in question. For example, the identification for the defect above which is written “any hose with a visible opening” will begin “G-70-“ and end with “(b)(2).” On the Atlantic Richfield system it will be “G-70-25(b)(2)”, on the Texaco system it will be “G-70-38(b)(2)”, and so on.

G-70-175 series Hasstech VCP-3A AST		
equipment	defects	verification procedure
(a) system	(1) any fueling point associated with a vapor line disconnected and open to the atmosphere, including all fueling points at the facility if vapor lines are manifolded	direct observation
	(2) system not in compliance with the static pressure decay test criteria *	TP201.3 or equivalent
	(3) pressure drop through the system exceeds one-half (0.50) inch water column at sixty cubic feet per hour (60 CFH)	TP201.4 or equivalent
(b) OPW 11VAI steel spout	(1) less than six unblocked vapor collection holes	direct observation
(c) OPW 11VAI aluminum spout	(1) less than four unblocked vapor collection holes	direct observation
(d) Emco Wheaton A4500 nozzle	(1) fewer than three unblocked vapor collection holes	direct observation
	(2) any visible puncture or tear of the vapor guard/vapor seal assembly	direct observation
(e) Husky V3 6201 nozzle	(1) all vapor collection holes blocked	direct observation
(f) Husky V34 6200-8	(1) all vapor collection holes blocked	direct observation
	(2) defective vapor valve	GDF-01/GDF-02
(g) collection unit	(1) any grade of a fueling point not capable of demonstrating an air to liquid ratio compliance with its performance standard	TP201.5 or equivalent
	(2) dispensing when the collection unit is disabled *	direct observation/ system monitor observation
	(3) normal operating level at the inlet of the collection unit less than thirty (30) inches water column vacuum *	direct measurement/ observation
(h) processing unit	(1) twenty (20) consecutive unsuccessful attempts to ignite the processing unit *	direct measurement/ observation/ system monitor observation
	(2) emissions which exceed Ringelmann one-half (½) or ten percent (10%) opacity and not attributable to a bulk delivery *	Method 9
	(3) dispensing when the processing unit is disabled *	direct measurement/ observation/system monitor observation
	(4) processing unit inoperative *	direct observation
(i) ECS-1 electronic control and status panel	(1) ratio of process unit/solenoid valve time less than nine tenths (0.90) *	direct measurement/ observation

* When the identified defect is detected in the listed equipment, the defect determination applies to all affected interrelated systems (which may include all systems at the motor vehicle fueling operation).

G-70-177 series Hirt VCS400-7		
equipment	defects	verification procedure
(a) system	(1) any fueling point associated with a vapor line disconnected and open to the atmosphere, including all fueling points at the facility if vapor lines are manifolded	direct observation
	(2) pressure drop through the system exceeds one-half (0.50) inch water column at sixty cubic feet per hour (60 CFH)	TP201.4 or equivalent
	(3) any grade of a fueling point not capable of demonstrating an air to liquid ratio compliance with its performance standard	TP201.5 or equivalent
	(4) processing unit inoperative *	direct observation
(b) OPW 11VA-29 nozzle	(1) defective vapor valve	GDF-01/GDF-02
	(2) less than five unblocked vapor collection holes	direct observation
(c) hoses	(1) any visible puncture or tear equivalent to a diameter of 0.136 inches or greater	direct measurement/ observation

* When the identified defect is detected in the listed equipment, the defect determination applies to all affected interrelated systems (which may include all systems at the motor vehicle fueling operation).

G-70-181 series Hirt VCS400-7 AGT (AST)		
equipment	defects	verification procedure
(a) system	(1) any fueling point associated with a vapor line disconnected and open to the atmosphere, including all fueling points at the facility if vapor lines are manifolded	direct observation
	(2) pressure drop through the system exceeds one-half (0.50) inch water column at sixty cubic feet per hour (60 CFH)	TP201.4 or equivalent
	(3) any grade of a fueling point not capable of demonstrating an air to liquid ratio compliance with its performance standard	TP201.5 or equivalent
	(4) processing unit inoperative *	direct observation
(b) OPW 11VA-29 nozzle	(1) defective vapor valve	GDF-01/GDF-02
	(2) less than five unblocked vapor collection holes	direct observation
(c) hoses	(1) any visible puncture or tear equivalent to a diameter of 0.136 inches or greater	direct measurement/ observation

* When the identified defect is detected in the listed equipment, the defect determination applies to all affected interrelated systems (which may include all systems at the motor vehicle fueling operation).

G-70-187 series Healy Model 400 ORVR AGT (AST)		
equipment	defects:	verification procedure
(a) nozzles	(1) any operating pressure range at the nozzle boot/fill-pipe interface less than one-half (0.50) inch water column vacuum or greater than one-fourth (0.25) inch water column pressure	EO G-70-187 Exhibit 5 test
	(2) defective vapor valve	EO G-70-191 Exhibit 2 vapor valve test or equivalent
	(3) any nozzle boot with a concatenation of all tears greater than one-half (0.50) inch in length	direct measurement/ observation
(b) central vacuum unit	(1) product dispensed when the central vacuum unit is inoperative or disabled *	direct measurement/ observation/TP201.5 or equivalent system monitor observation
	(2) system does not achieve an operating vacuum of sixty-five (65) inches water column for three consecutive dispensing episodes *	direct measurement/ observation/system monitor observation
	(3) system does not achieve an operating vacuum of sixty-five (65) inches water column within a one hour period for any single dispensing episode *	direct measurement/ observation/system monitor observation
	(4) vacuum level dropping below sixty (60) inches water column for more than three seconds after the system has reached sixty-five (65) inches water column, while dispensing is occurring *	direct measurement/ observation/system monitor observation
	(5) vacuum level above ninety (90) inches water column while dispensing is occurring *	direct measurement/ observation/system monitor observation
	(6) product dispensing when the non-restrictive ball valve installed in the vapor return line is closed *	direct measurement/ observation
(c) system	(1) any fueling point associated with a vapor line disconnected and open to the atmosphere, including all fueling points at the facility if vapor lines are manifolded	direct observation
	(2) system not in compliance with the static pressure decay test criteria *	TP201.3 or equivalent
	(3) pressure drop through the system exceeds one-half (0.50) inch water column at sixty cubic feet per hour (60 CFH)	TP201.4 or equivalent
	(4) any venting through system monitor vent in excess of ten hours in any calendar day not attributable to a Phase I fuel delivery *	direct measurement/ observation/system monitor observation

*** When the identified defect is detected in the listed equipment, the defect determination applies to all affected interrelated systems (which may include all systems at the motor vehicle fueling operation).**

G-70-191 series Healy ORVR		
equipment	defects	verification procedure
(a) nozzles	(1) any Healy model 800 nozzle with a vapor collection boot which has one-half (50%) of the mini-boot faceplate or greater missing	direct measurement/ observation
	(2) defective vapor valve	EO G-70-191 Exhibit 2 vapor valve test or equivalent
(b) system	(1) any grade of a fueling point not capable of demonstrating an air to liquid ratio compliance with its performance standard	TP201.5 or equivalent
	(2) any fueling point associated with a vapor line disconnected and open to the atmosphere, including all fueling points at the facility if vapor lines are manifolded	direct observation
	(3) system not in compliance with the static pressure decay test criteria *	TP201.3 or equivalent
	(4) pressure drop through the system exceeds one-half (0.50) inch water column at sixty cubic feet per hour (60 CFH)	TP201.4 or equivalent
	(5) inoperative vapor pumps *	direct observation in accordance with the Healy Systems VP1000 Dispenser Mounted Vacuum Pump Installation & Service Guide, Scheduled Maintenance Instructions, Weekly Inspection, bullet 4 et ~~s~~Seq.

*** When the identified defect is detected in the listed equipment, the defect determination applies to all affected interrelated systems (which may include all systems at the motor vehicle fueling operation).**

G-70-193 series Hill-Vac AST		
equipment	defects	verification procedure
(a) system	(1) fillpipe gauge pressure less than negative one (–1.0) inch or greater than two (2.0) inches water column	direct measurement/ observation
	(2) any fueling point associated with a vapor line disconnected and open to the atmosphere, including all fueling points at the facility if vapor lines are manifolded	direct observation
	(3) system not in compliance with the static pressure decay test criteria *	TP201.3 or equivalent
	(4) pressure drop through the system exceeds one-half (0.50) inch water column at sixty cubic feet per hour (60 CFH)	TP201.4 or equivalent
(b) nozzles	(1) a boot with any tear exceeding one-half (0.50) inch	direct measurement/ observation
	(2) faceplate damage such that the fillpipe interface is adversely affected for twenty-five percent (25%) or more of the circumference of the faceplate	direct measurement/ observation
(c) jet pump	(1) dispensing of gasoline when either jet pump is disabled	direct observation
	(2) failure to achieve operating vacuum of thirty-five (35) inches water column within five seconds after the system is activated, for three consecutive dispensing episodes	direct measurement/ observation
	(3) a vacuum level below fifteen (15) inches water column for more than three seconds after the system has reached thirty-five (35) inches water column while dispensing	direct measurement/ observation
	(4) a vacuum level above eighty-five (85) inches water column measured while dispensing to non-ORVR vehicles	direct measurement/ observation
	(5) product dispensing when any ball valve installed at the vapor return line connection to each Healy Model 100 jet pump is closed	direct measurement/ observation
(d) Liquid drop out pot	(1) opening drain valve at anytime other than when repair operations are underway	direct observation
	(2) product dispensing when any ball valve installed at the liquid drop pot in the liquid removal line is closed	direct measurement/ observation

* When the identified defect is detected in the listed equipment, the defect determination applies to all affected interrelated systems (which may include all systems at the motor vehicle fueling operation).

G-70-200 series Oldcastle Buried Vapor Return Piping AST G-70-201 series Oldcastle Trenched Vapor Return Piping AST		
equipment	defects	verification procedure
(a) nozzles	(1) any nozzle boot torn in one or more of the following manners: a triangular-shaped or similar tear one-half (0.50) inch or more on any side, or hole one-half (0.50) inch or more in diameter, or slit one (1.0) inch or more in length	direct measurement/ observation
	(2) any faceplate or flexible cone damaged in the following manner: for balance nozzles and for nozzles for aspirator and eductor assist type systems, damage such that the capability to achieve a seal with a fill pipe interface is affected for one-fourth (25%) of the circumference of the faceplate (accumulated)	direct measurement/ observation
	(3) flexible cone damaged in the following manner: for booted type nozzles for vacuum assist-type systems, more than one-fourth (25%) of the flexible cone missing	direct measurement/ observation
	(4) insertion interlock mechanism which will allow dispensing when the bellow is uncompressed	direct observation/ GDF-09
(b) hoses	(1) any coaxial balance hose with 100 ml or more liquid in the vapor path	direct measurement
	(2) any hose with a visible opening	direct observation
(c) processing unit	(1) vapor processing unit inoperative *	direct observation

* When the identified defect is detected in the listed equipment, the defect determination applies to all affected interrelated systems (which may include all systems at the motor vehicle fueling

G-70-202 series Gilbarco Vapor Vac AST		
equipment	defects	verification procedure
(a) system	(1) any fueling point associated with a vapor line disconnected and open to the atmosphere, including all fueling points at the facility if vapor lines are manifolded	direct observation
	(2) both booted and unbooted nozzle types connected to the same vapor pump	direct observation
	(3) any grade of a fueling point not capable of demonstrating an air to liquid ratio compliance with its performance standard	TP201.5 or equivalent
(b) Catlow ICVN nozzle	(1) less than three unblocked vapor holes	direct observation
	(2) defective vapor valve	GDF-01/GDF-02
	(3) efficiency compliance device slit from base to the rim	direct observation
(c) Emco Wheaton A4505 nozzle	(1) less than three unblocked vapor holes	direct observation
	(2) defective vapor valve	GDF-01/GDF-02
	(3) one-eighth (13%) of vapor guard circumference missing	direct measurement/ observation
(d) Emco Wheaton A4500 nozzle	(1) less than three unblocked vapor holes	direct observation
(e) Husky V34 6250 nozzle	(1) a one and one-half (1.5) inch or greater slit in vapor splash guard	direct measurement/ observation
	(2) any hole greater than three-eighths (0.38) inch in vapor splash guard	direct measurement/ observation
	(3) defective vapor valve	GDF-01/GDF-02
(f) Husky V3 6201 nozzle	(1) all vapor holes blocked	direct observation
(g) OPW 11VAI nozzle	(1) less than four unblocked vapor holes	direct observation
(h) OPW12VW nozzle	(1) all vapor holes blocked	direct observation
	(2) defective vapor valve	GDF-01/GDF-02
	(3) vapor escape guard with three-fourths (75%) of the circumference missing	direct measurement/ observation

G-70-204 series Gilbarco Vapor Vac/OPW Vaporsaver		
equipment	Defects	verification procedure
(a) system	(1) pressure drop through the system exceeds one-half (0.50) inch water column at sixty cubic feet per hour (60 CFH) *	TP201.4 or equivalent
	(2) any fueling point associated with a vapor line disconnected and open to the atmosphere, including all fueling points at the facility if vapor lines are manifolded	direct observation
	(3) system not in compliance with the static pressure decay test criteria *	TP201.3 or equivalent
	(4) any grade of a fueling point not capable of demonstrating an air to liquid ratio compliance with its performance standard	TP201.5 or equivalent
	(5) defective vapor valve	GDF-01/GDF-02
(b) Catlow ICVN nozzle	(1) less than three unblocked vapor holes	direct observation
	(2) efficiency compliance device slit from base to the rim	direct observation
(c) Emco Wheaton A4505 nozzle	(1) less than three unblocked vapor holes	direct observation
	(2) one-eighth (1/8) of vapor guard circumference missing or equivalent cumulative damage	direct measurement/ observation
(d) Husky V34 6250 nozzle	(1) a one and one-half (1.5) inch or greater slit in vapor splash guard or equivalent cumulative damage	direct measurement/ observation
	(2) any hole greater than three-eighths (3/8) inch in vapor splash guard or equivalent cumulative damage	direct measurement/ observation
(e) OPW12VW nozzle	(1) all vapor holes blocked	direct observation
	(2) vapor escape guard with three-fourths (3/4) of the circumference missing or equivalent cumulative damage	direct measurement/ observation
(f) vapor processor	(1) vapor processor inoperative for more than 24 consecutive hours *	direct observation/ G-70-204 Exhibit 2

* When the identified defect is detected in the listed equipment, the defect determination applies to all affected interrelated systems (which may include all systems at the motor vehicle fueling operation).

G-70-209 series Dresser/Wayne Vac/Arid Technologies Permeator		
equipment	defects	verification procedure
(a) system	(1) any splash guard that interferes with the operation of a vapor escape guard (VEG) or vapor splash guard (VSG) unit	direct measurement/ observation
	(2) any grade of a fueling point not capable of demonstrating an air to liquid ratio compliance with its performance standard	TP201.5, G-70-209 Exhibit 5, or equivalent
	(3) any fueling point associated with a vapor line disconnected and open to the atmosphere, including all fueling points at the facility if vapor lines are manifolded	direct observation
	(4) system not in compliance with the static pressure decay test criteria *	TP201.3 or equivalent
	(5) pressure drop through the system exceeds one-half (0.50) inch water column at sixty cubic feet per hour (60 CFH)	TP201.4 or equivalent
	(6) defective vapor valve	GDF-01/GDF-02
(b) permeator	(1) permeator inoperative for more than 24 consecutive hours	direct observation
(c) OPW 12VW nozzle	(1) all vapor holes blocked	direct observation
	(2) any VEG damaged such that at least three-quarters (75%) of the circumference is missing	direct measurement/ observation
(d) Husky V34 6250 nozzle	(1) any VSG damaged such that at least a one and one-half (1.5) inch slit has developed	direct measurement/ observation
	(2) any VSG flange portion that does not make contact with or cover the entire fill-pipe opening	direct measurement/ observation
	(3) any VSG with a hole greater than three-eighths (0.38) inch	direct measurement/ observation
(e) Emco Wheaton A4505 nozzle	(1) less than three unblocked vapor holes	direct observation
	(2) any vapor guard (VG) damaged such that at least one-eighth (13%) of the circumference is missing	direct measurement/ observation
(f) Catlow ICVN and Richards Astrovac nozzles	(1) less than three unblocked vapor holes	direct observation
	(2) any efficiency compliance device damaged with a slit from the base to the rim	direct observation

* When the identified defect is detected in the listed equipment, the defect determination applies to all affected interrelated systems (which may include all systems at the motor vehicle fueling operation).

VR-201 series Healy Phase II EVR System not including ISD		
equipment	defects	verification procedure
(a) nozzles	(1) defective vapor valve	TP-201.2B or equivalent or VR-201 Exhibit 7 – Nozzle Bag Test Procedure
	(2) any fueling point whose V/L ratio is determined to be at or below 0.80	VR-201 Exhibit 5 – Vapor to Liquid Volume Ratio for Healy Phase II EVR System
(b) ~~system~~ vapor pump	(1) inoperative vapor pumps *	direct observation in accordance with the Healy IOMM, Scheduled Maintenance, section 1.1 paragraph 3 et ~~s~~Seq.
(c) clean air separator (CAS) ~~(vapor reservoir)~~	(1) clean air separator static pressure performance failure *	VR-201 Exhibit 4 – Determination of Static Pressure Performance of the Healy Clean Air Separator
	~~(2) clean air separator not in the proper operating configuration *~~	~~direct observation shown in VR-201 Exhibit 2~~
	(2) ball valves are not in the proper operating configuration as shown in Figures in Exhibit 2 *	direct observation/ shown in VR-201 Exhibit 2 – System Specifications
(d) dispenser	(1) any dispenser with a dispenser piping test valve in the closed position	direct observation

* When the identified defect is detected in the listed equipment, the defect determination applies to all affected interrelated systems (which may include all systems at the motor vehicle fueling operation).

VR-202 series Healy Phase II EVR System Including ISD		
equipment	defects	verification procedure
(a) nozzles	(1) defective vapor valve	TP-201.2B or equivalent or VR-202 Exhibit 7 – Nozzle Bag Test Procedure
	(2) any fueling point whose V/L ratio is determined to be at or below 0.80	VR-202 Exhibit 5 – Vapor to Liquid Volume Ratio for Healy Phase II EVR System
(b) ~~system~~ vapor pump	(1) inoperative vapor pumps *	direct observation in accordance with the Healy IOMM, Scheduled Maintenance, section 1.1 paragraph 3 et ~~s~~Seq.
(c) clean air separator (CAS) ~~(vapor reservoir)~~	(1) clean air separator static pressure performance failure *	VR-202 Exhibit 4 – Determination of Static Pressure Performance of the Healy Clean Air Separator
	~~(2) clean air separator not in the proper operating configuration *~~	~~direct observation/ shown in VR-202 Exhibit 2~~
	(2) ball valves are not in the proper operating configuration as shown in Figures in Exhibit 2 *	direct observation/ shown in VR-202 Exhibit 2 – System Specifications
(d) dispenser	(1) any dispenser with a dispenser piping test valve in the closed position	direct observation

* When the identified defect is detected in the listed equipment, the defect determination applies to all affected interrelated systems (which may include all systems at the motor vehicle fueling operation).

VR-203 series VST Phase II EVR System ~~sans~~not including ISD		
equipment	defects	verification procedure
(a) VST nozzle	(1) more than 30 percent (30%) of a nozzle face seal is missing (e.g., a triangular or similar shape in which greater than two and one half (2.5) inches of the face seal circumference is missing (accumulated))	direct measurement/ observation
	(2) more than 0.4~~375~~ square inches of a nozzle vapor collection sleeve is missing (e.g., a rectangular shape of greater than nine sixteenths (9/16) inch or more on each side, a circular shape of eleven sixteenths (11/16) inch or more in diameter, or a triangular shape of seven eighths (7/8) inch on the side	direct measurement/ observation
	(3) ~~total~~ cumulative slit length in the convolution/s exceeds 18.0 inches	direct measurement/ observation
	(4) insertion interlock mechanism which will allow dispensing when the bellows is uncompressed	Section of IOMM 'Daily Inspection – VST Nozzles, Check A' ~~direct observation/GDF-09~~
(b) EMCO nozzle	(1) more than 0.4 square inches of a nozzle boot face material is missing (e.g., a triangular or similar shape in which greater than 7/16 inches of the boot face circumference is missing (accumulated))	direct measurement/ observation
	(2) slit across seven (7) consecutive bellows convolutions	direct measurement/ observation
	(3) a 360 degree cut around the bellows convolutions	direct measurement/ observation
	(4) insertion interlock mechanism which will allow dispensing when the bellows is uncompressed	direct observation/ GDF-09 Phase II Balance System Nozzle Insertion Interlock Operation Determination
(c) all nozzles	(~~5~~1) defective vapor valve	VR-203 ~~Exhibit 10~~ Exhibit 7 – Nozzle Bag Test Procedure
	(~~6~~2) vapor valve leak rate exceeds 0.07 cubic feet per minute at a pressure of two (2) water column inches	TP-201.2B
(~~b~~d) hoses	(1) ~~175~~ 150 ml or more liquid in the vapor path	direct measurement/ sections 6.1 to 6.5 of VR-203 Exhibit 5 - Liquid Removal Test Procedure
	(2) any hose with a visible opening	direct observation
(~~c~~ e) VST ECS processor~~ing unit~~	(1) unit inoperative *	direct observation
	(2) ball valves are not locked in the proper operating configuration as shown in Figures in Exhibit 2 ~~2B-2~~*	direct observation/ shown in VR-203 Exhibit 2– System Specifications
	(3) unit is not on or in the automatic vapor processor mode *	diagnostic section of the Pressure Measurement/Management Control of IOMM~~n 16) of IOM~~
	~~(4) processor alarms for emission factor are activated for two consecutive 24 hour periods*~~	~~direct observation~~

* When the identified defect is detected in the listed equipment, the defect determination applies to all affected interrelated systems (which may include all systems at the motor vehicle fueling operation).

VR-203 series VST Phase II EVR System ~~sans~~not including ISD		
equipment	defects	verification procedure
	(~~5~~4) unit fails to activate when the UST pressure is less than or equal to 0.4 water column inch *	VR-203 Exhibit 9 - VST ECS Determination of Processor Activation Pressure
	~~(6) hydrocarbon concentration exceeds 12 percent (12%)*~~	~~direct observation~~
(f) vapor polisher	(1) unit inoperative *	direct observation
	(2) ball valves are not in the proper operating configuration as shown in Figure in Exhibit 2 *	direct observation / shown in VR-203 Exhibit 2 – System Specifications
	(3) unit is not on or in the automatic vapor processor mode *	diagnostic section of the Pressure Measurement/Management Control of IOMM
(g) thermal oxidizer	(1) unit inoperative *	direct observation
	(2) ball valves are not in the proper operating configuration as shown in Figures in Exhibit 2 *	direct observation/ shown in VR-203 Exhibit 2 – System Specifications
	(3) thermal oxidizer indicator panel “power on” lamp off *	direct observation
(h) clean air separator (CAS)	(1) ball valves are not in the proper operating configuration as shown in Figures in Exhibit 2 *	direct observation/ shown in VR-203 Exhibit 2 – System Specifications
	(2) clean air separator static pressure performance failure *	VR-203 - Exhibit 14 Determination of Static Pressure Performance of the Healy Clean Air Separator
~~(d) vapor return lines~~	~~(1) pressure drop through the vapor path exceeds five (5.00) water column inches at a flow rate of 60 cubic foot per hour (CFH) and eight (8.00) water column inches at a flow rate of 80 CFH~~	~~TP201.4 Methodology 1 or equivalent~~

* When the identified defect is detected in the listed equipment, the defect determination applies to all affected interrelated systems (which may include all systems at the motor vehicle fueling operation).

VR-204 series VST Phase II EVR System Including ISD		
equipment	defects	verification procedure
(a) VST nozzle	(1) more than 30 percent (30%) of a nozzle face seal is missing (e.g., a triangular or similar shape in which greater than two and one half (2.5) inches of the face seal circumference is missing (accumulated))	direct measurement/ observation
	(2) more than 0.4 square inches of a nozzle vapor collection sleeve is missing (e.g., a rectangular shape of greater than nine sixteenths (9/16) inch or more on each side, a circular shape of eleven sixteenths (11/16) inch or more in diameter, or a triangular shape of seven eighths (7/8) inch on the side	direct measurement/ observation
	(3) cumulative slit length in the convolution/s exceeds 18.0 inches	direct measurement/ observation
	(4) insertion interlock mechanism which will allow dispensing when the bellows is uncompressed	Section of IOMM 'Daily Inspection – VST Nozzles, Check A'
(b) EMCO nozzle	(1) more than 0.4 square inches of a nozzle boot face material is missing (e.g., a triangular or similar shape in which greater than 7/16 inches of the boot face circumference is missing (accumulated))	direct measurement/ observation
	(2) slit across seven (7) consecutive bellows convolutions	direct measurement/ observation
	(3) there is a 360 degree cut around the bellows convolutions	direct measurement/ observation
	(4) insertion interlock mechanism which will allow dispensing when the bellows is uncompressed	direct observation/ GDF-09 - Phase II Balance System Nozzle Insertion Interlock Operation Determination
(c) all nozzles	(1) defective vapor valve	VR-204 Exhibit 7 – Nozzle Bag Test Procedure
	(2) vapor valve leak rate exceeds 0.07 cubic feet per minute at a pressure of two (2) water column inches	TP-201.2B
(d) hoses	(1) 150 ml or more liquid in the vapor path	direct measurement/ sections 6.1 to 6.5 of VR-204 Exhibit 5 - Liquid Removal Test Procedure
	(2) any hose with a visible opening	direct observation
(e) VST ECS processor	(1) unit inoperative *	direct observation
	(2) ball valves are not in the proper operating configuration as shown in Figures in Exhibit 2 *	direct observation/ shown in VR-204 Exhibit 2 – System Specifications
	(3) unit is not on or in the automatic vapor processor mode *	diagnostic section of the Pressure Measurement/Management Control of IOMM
	(4) unit fails to activate when the UST pressure is less than or equal to 0.4 water column inch *	direct observation from ISD panel or a vapor processor status report

* When the identified defect is detected in the listed equipment, the defect determination applies to all affected interrelated systems (which may include all systems at the motor vehicle fueling operation).

VR-204 series VST Phase II EVR System Including ISD		
equipment	defects	verification procedure
(f) vapor polisher	(1) unit inoperative *	vapor processor status report
	(2) ball valves are not in the proper operating configuration as shown in Figures in Exhibit 2 *	direct observation/ shown in VR-204 Exhibit 2 – System Specifications
	(3) unit is not on or in the automatic vapor processor mode *	diagnostic section of the Pressure Measurement/Management of IOMM

* When the identified defect is detected in the listed equipment, the defect determination applies to all affected interrelated systems (which may include all systems at the motor vehicle fueling operation).

VR-207 series EMCO Wheaton Retail Phase II EVR System with HIRT VCS 100 Thermal Oxidizer not Including ISD		
equipment	defects	verification procedure
(a) EMCO nozzle	(1) more than 0.4 square inches of a nozzle boot face material is missing (e.g., a triangular or similar shape in which greater than 7/16 inches of the boot face circumference is missing (accumulated))	direct measurement/ observation
	(2) slit across seven (7) consecutive bellows convolutions	direct measurement/ observation
(b) all nozzles	(1) insertion interlock mechanism which will allow dispensing when the bellows is uncompressed	direct observation/ GDF-09
	(2) defective vapor valve	VR-207 Exhibit 7 – Nozzle Bag Test Procedure
	(3) vapor valve leak rate exceeds 0.07 cubic feet per minute at a pressure of two (2) water column inches	TP-201.2B
(c) hoses	(1) 150 ml or more liquid in the vapor path	direct measurement/ sections 6.1 to 6.5 of VR-207 Exhibit 5 - Liquid Removal Test Procedure
	(2) any hose with a visible opening	direct observation
(d) thermal oxidizer	(1) unit inoperative *	direct observation
	(2) ball valves are not in the proper operating configuration as shown in Figures in Exhibit 2 *	direct observation/ shown in VR-207 Exhibit 2 – System Specifications
	(3) thermal oxidizer indicator panel “power on” lamp off *	direct observation
(e) vapor return lines	(1) pressure drop through the vapor path exceeds 0.95 water column inches at a flow rate of 60 cubic foot per hour (CFH) and 1.52 water column inches at a flow rate of 80 CFH	TP201.4 Methodology 1 and Exhibit 6 – Required Items in Conducting TP-201.4

* When the identified defect is detected in the listed equipment, the defect determination applies to all affected interrelated systems (which may include all systems at the motor vehicle fueling operation).

VR-208 series EMCO Wheaton Retail Phase II EVR System with HIRT VCS 100 Thermal Oxidizer Including ISD		
equipment	defects	verification procedure
(a) EMCO nozzle	(1) more than 0.4 square inches of a nozzle boot face material is missing (e.g., a triangular or similar shape in which greater than 7/16 inches of the boot face circumference is missing (accumulated))	direct measurement/ observation
	(2) slit across seven (7) consecutive bellows convolutions	direct measurement/ observation
(b) all nozzles	(1) insertion interlock mechanism which will allow dispensing when the bellows is uncompressed	direct observation/ GDF-09
	(2) defective vapor valve	VR-208 Exhibit 7 – Nozzle Bag Test Procedure
	(3) vapor valve leak rate exceeds 0.07 cubic feet per minute at a pressure of two (2) water column inches	TP-201.2B
(c) hoses	(1) 150 ml or more liquid in the vapor path	direct measurement/ sections 6.1 to 6.5 of VR-208 Exhibit 5 – Liquid Removal Test Procedure
	(2) any hose with a visible opening	direct observation
(d) thermal oxidizer	(1) unit inoperative *	direct observation
	(2) ball valves are not in the proper operating configuration as shown in Figure in Exhibit 2*	direct observation/ shown in VR-208 Exhibit 2 - System Specifications
	(3) thermal oxidizer indicator panel “power on” lamp off*	direct observation
(e) vapor return lines	(1) pressure drop through the vapor path exceeds 0.95 water column inches at a flow rate of 60 cubic foot per hour (CFH) and 1.52 water column inches at a flow rate of 80 CFH	TP201.4 Methodology 1 and Exhibit 6 – Required Items in Conducting TP-201.4

* When the identified defect is detected in the listed equipment, the defect determination applies to all affected interrelated systems (which may include all systems at the motor vehicle fueling operation).

Defect Identification Methods Specified In the Verification Procedure Column	
1. TP201.2B:	Flow and Pressure Measurement of Vapor Recovery Equipment
2. TP201.3	Determination of Two-Inch WC Static Pressure Performance of Vapor Recovery Systems of Dispensing Facilities
3. TP201.4	Determination of Dynamic Pressure Performance of Vapor Recovery Systems of Dispensing Facilities
4. TP201.5	Determination (by Volume Meter) of Air to Liquid (A/L) Volume Ratio of Vapor Recovery Systems of Dispensing Facilities, Adopted April 12, 1996
5. GDF-01	Bag Test for Multi-Nozzle Vacuum Assist Systems
6. GDF-02	Bag Test for Single-Nozzle Vacuum Assist Systems
7. GDF-09	Phase II Balance System Nozzle Insertion Interlock Operation Determination
8. Method 9	40 Code Federal Regulations Part 60 Appendix A: Reference Method 9 EPA Section 3.12 Visible Determination of the Opacity of Emissions from Stationary Sources
9. EPO No. 26-F-1	Vapor Recovery Systems Field Compliance Testing
10. G-70-187 Exhibit 5	Fillneck Vapor Pressure Regulation Fueling Test
11. G-70-191 Exhibit 2	Specifications for the Healy ORVR Phase II Vapor Recovery System (4.a - 4.d)
12. G-70-204 Exhibit 2	System Specifications/Vaporsaver (1.A - 1.D)
13. G-70-209 Exhibit 5	Determination (by Volume Meter) of Air to Liquid Volume Ratio of Vapor Recovery Systems of Dispensing Facilities
14. VR-201 Exhibit 2	System Specifications
15. VR-201 Exhibit 4	Determination of Static Pressure Performance of the Healy Clean Air Separator
16. VR-201 Exhibit 5	Vapor to Liquid Volume Ratio for Healy Phase II EVR System
17. VR-201 Exhibit 7	Nozzle Bag Test Procedure
18. VR-202 Exhibit 2	System Specifications
19. VR-202 Exhibit 4	Determination of Static Pressure Performance of the Healy Clean Air Separator
20. VR-202 Exhibit 5	Vapor to Liquid Volume Ratio for Healy Phase II EVR System
21. VR-202 Exhibit 7	Nozzle Bag Test Procedure
22. VR-203 Exhibit 2	System Specifications
23. VR-203 Exhibit 5	Liquid Removal Test Procedure
24. VR-203 Exhibit 710	Nozzle Bag Test Procedure
25. VR-203 Exhibit 9	VST ECS Determination of Processor Activation Pressure
26. VR-203 Exhibit 14	Determination of Static Pressure Performance of the Healy Clean Air Separator
27. VR-203: Installation, Operation and Maintenance Manual (IOMM)	Daily Inspection – VST Nozzles Check A
28. VR-203: Installation, Operation and Maintenance Manual (IOMM)	Veeder-Root Vapor Polisher: Pressure Management Control

Defect Identification Methods Specified In the Verification Procedure Column	
29. VR-203: Installation, Operation and Maintenance Manual (IOMM)	Diagnostic section of the Pressure Measurement/Management Control of IOMM
30. VR-204 Exhibit 2	System Specifications
31. VR-204 Exhibit 5	Liquid Removal Test Procedure
32. VR-204 Exhibit 7	Nozzle Bag Test Procedure
33. VR-204 Exhibit 9	VST ECS Determination of Processor Activation Pressure
34. VR-204: Installation, Operation and Maintenance Manual (IOMM)	Diagnostic section of the Pressure Measurement/Management Control of IOMM
35. VR-207 Exhibit 2	System Specifications
36. VR-207 Exhibit 5	Liquid Removal Test Procedure
37. VR-207 Exhibit 7	Nozzle Bag Test Procedure
38. VR-208 Exhibit 2	System Specifications
39. VR-208 Exhibit 5	Liquid Removal Test Procedure
40. VR-208 Exhibit 7	Nozzle Bag Test Procedure
41. VR-208 Exhibit 8	Indicator Panel Operability Test Procedure

Appendix 3:
California Health and Safety Code, Section 41960.2

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California Health and Safety Code

H&S 41960.2 Maintenance of Installed Systems

41960.2. (a) All installed systems for the control of gasoline vapors resulting from motor vehicle fueling operations shall be maintained in good working order in accordance with the manufacturer's specifications of the system certified pursuant to Section 41954.

(b) Whenever a gasoline vapor recovery control system is repaired or rebuilt by someone other than the original manufacturer or its authorized representative, the person shall permanently affix a plate to the vapor recovery control system that identifies the repairer or rebuilder and specifies that only certified equipment was used. In addition, a rebuilder of a vapor control system shall remove any identification of the original manufacturer if the removal does not affect the continued safety or performance of the vapor control system.

(c) (1) The executive officer of the state board shall identify and list equipment defects in systems for the control of gasoline vapors resulting from motor vehicle fueling operations that substantially impair the effectiveness of the systems in reducing air contaminants. The defects shall be identified and listed for each certified system and shall be specified in the applicable certification documents for each system.

(2) On or before January 1, 2001, and at least once every three years thereafter, the list required to be prepared pursuant to paragraph (1) shall be reviewed by the executive officer at a public workshop to determine whether the list requires an update to reflect changes in equipment technology or performance.

(3) Notwithstanding the timeframes for the executive officer's review of the list, as specified in paragraph (2), the executive officer may initiate a public review of the list upon a written request that demonstrates, to the satisfaction of the executive officer, the need for such a review. If the executive officer determines that an update is required, the update shall be completed no later than 12 months after the date of the determination.

(d) When a district determines that a component contains a defect specified pursuant to subdivision (c), the district shall mark the component "Out of Order." No person shall use or permit the use of the component until the component has been repaired, replaced, or adjusted, as necessary, and the district has reinspected the component or has authorized use of the component pending reinspection.

(e) Where a district determines that a component is not in good working order but does not contain a defect specified pursuant to subdivision(c), the district shall provide the operator with a notice specifying the basis on which the component is not in good working order. If, within seven days, the operator provides the district with adequate evidence that the component is in good working order, the operator shall not be subject to liability under this division.

(Amended by Stats. 1999, Ch. 501, Sec. 1.)

Regulations: 17, CCR, sections 94006, 94010, 94011