California Environmental Protection Agency

Air Resources Board

PROPOSED

Vapor Recovery Test Procedure

TP- 201.2I

Test Procedure for In-Station Diagnostic Systems

Adopted: October 8, 2003
Amended:

[Note: The text is shown in ~~strikeout~~ to indicate that it is proposed for deletion and underline to indicate that it is proposed for addition. [Bracketed text] is not part of the proposed amendments. Only the amended section is shown.]

9. TESTING PROPER ISD SYSTEM OPERATION INCLUDING GENERATION OF AUTOMATIC ALARMS AND ACTIONS

9.1 General Considerations

As required in CP-201, the ISD system manufacturer shall provide a means for verifying proper operation of the ISD system.

Appropriate methods for such testing may include, depending on the nature of the ISD system and subject to approval of the Executive Officer: (1) temporary substitution of test data files reflecting failure conditions for actual data acquired and recorded by the ISD system; (2) temporary connection of special electrical equipment or components in the system's sensor circuitry to emulate failure conditions; (3) temporary modification or adjustment of the vapor recovery system which causes it to fail in a safe and controlled manner.

Testing by any of these means may require that tampering protections be bypassed, acquired data be flagged as affected by testing activity, or both.

9.2 Appropriateness of Generated Alarms

During certification testing the nature of the alarms generated by the system shall be considered and approved. Alarms which disrupt operations by virtue of being too loud or intrusive may risk being disabled by tampering. Alarms which are not sufficiently loud or intrusive may not be recognized or acted on by operating personnel. Common practice often calls for both audible and visible alarm indications, and for the ability to silence audible alarms once they have been heard.

9.3 System Startup and Restart

Verify that information indicating a restart is stored by the system as required by CP-201 by inducing or simulating a loss of power to the system.

9.4 Sensor Failure Detection

Verify that the system has the ability to test the integrity of its sensors and that an induced or simulated sensor failure causes an appropriate system response. At a minimum the ISD system should be capable of detecting removal or disconnection of any sensor.

9.5 A/L Gross Failure Response (Assist Systems Only)

This test spans an actual or simulated period of two (2) days for failures below the acceptable A/L range, two (2) days for failures above the acceptable A/L range, and two (2) days for borderline acceptable operation.

Induce or simulate A/L failure conditions and borderline acceptability conditions as follows and verify appropriate system response; Arrange induced or simulated conditions considering the ISD system's timing of daily assessments of A/L ratio acceptability. An alarm is scheduled immediately when any daily assessment shows failure, and interruption of fueling is scheduled immediately when a second consecutive daily assessment shows failure.

At a level 75 percent (75%) above the upper A/L range limit in the presence of a five-percent (5%)-probable negative error in measurement of A/L by the ISD system, and at a level 75 percent (75%) below the lower A/L range limit in the presence of a five-percent (5%)-probable positive error in measurement of A/L by the ISD system, the system should alarm and disable fueling as scheduled. Manual re-enabling of fueling should be successful and events should be properly recorded by the system.

At the lower A/L range limit in the presence of a one-percent (1%)-probable negative error in A/L measurement by the ISD system, and at the upper range limit in the presence of a one-percent (1%)-probable positive error, the system should neither alarm or disable fueling.

9.6 A/L Degradation Response (Assist Systems Only)

This test spans an actual or simulated period of two (2) weeks for failures below the acceptable A/L range, two (2) weeks for failures above the acceptable A/L range, and two (2) weeks for borderline acceptable operation.

Proceed as for the Gross Failure checks above but with A/L 25 percent (25%) outside certified range rather than 75 percent (75%) outside certified range and considering that the assessment interval is one (1) week rather than one (1) day.

9.7 Reduced Vapor Collection Flow Performance (Balance Systems Only)

This test spans an actual or simulated period of two (2) days for failures below the acceptable vapor collection flow performance level and two (2) days for borderline acceptable operation.

Induce or simulate reduced vapor collection flow and borderline acceptability conditions as follows and verify appropriate system response. Arrange induced or simulated conditions considering the ISD system's timing of daily assessments of vapor collection flow performance acceptability. An alarm is scheduled immediately when any daily assessment shows failure, and interruption of fueling is scheduled immediately when a second consecutive daily assessment shows failure.

With vapor collection flow performance 50 percent (50%) below the minimum certified level and a five-percent (5%)-probable positive error in ISD system measurement of vapor collection flow the system should alarm and disable fueling as scheduled. Manual re-enabling of fueling should be successful and events should be properly recorded by the system.

With vapor collection flow performance at the minimum certified level for the vapor recovery system and a one-percent (1%)-probable negative error in measurement of vapor collection flow by the ISD system the system should neither alarm nor disable fueling.

9.8 Central Vacuum System Failure (Systems so equipped only)

This test spans an actual or simulated period of 20 minutes for failures and 20 minutes for borderline acceptable conditions.

Induce or simulate a Central Vacuum Unit failure. The ISD system should alarm and disable fueling after 20 minutes. Manual re-enabling of fueling should be successful and events should be properly recorded by the system.

If detection of failure depends on quantitative measurements made by the ISD system, the Executive Officer shall specify an appropriate definition of borderline operating conditions. When such conditions are induced or simulated and a one-percent (1%) probable worst-case (positive or negative as applicable) error exists in quantitative measurements made by the ISD system the system should not alarm or interrupt fueling.

9.9 UST Ullage Pressure - Gross Failure Response

This test spans an actual or simulated period of two (2) weeks for failures where UST ullage pressure exceeds the specified criteria and two (2) weeks for borderline acceptable operation.

Induce or simulate UST ullage pressure excessive values and borderline acceptability conditions as follows and verify appropriate system response. Arrange induced or simulated conditions considering the ISD system's timing of weekly assessments of UST ullage pressure acceptability. An alarm is scheduled immediately when any weekly assessment shows failure, and interruption of fueling is scheduled immediately when a second consecutive weekly assessment shows failure.

If UST ullage pressure during a week exceeds 1.5 Inches of H_2O during five percent (5%) of the time and a five-percent (5%)-probable negative measurement error is present whenever pressure exceeds1.5 inches H_2O, the system should alarm and disable fueling as scheduled. Manual re-

enabling of fueling should be successful and events should be properly recorded by the system.

If UST ullage pressure during a week is at the maximum allowable level permitted by an executive order applicable to the vapor recovery system (or the 95th percentile level of pressures actually observed in the system if no maximum limit is specified by an applicable executive order) during the time and a one-percent (1%)-probable positive measurement error is present whenever pressure exceeds1.5 inches H_2O the system should neither alarm or disable fueling.

9.10 UST Ullage Pressure - Degradation Response

This test spans an actual or simulated period of two (2) months for failures where UST ullage pressure exceeds the criteria as specified and two (2) months for borderline acceptable operation.

Proceed as for the UST ullage pressure Gross Failure checks above but with UST ullage pressure above 0.5 inches of H_2O during 25 percent (25%) of the time rather than above 1.5 inches of H_2O during five percent (5%) of the time. Arrange induced or simulated conditions considering the ISD system's timing of monthly assessments of UST ullage pressure acceptability. An alarm is scheduled immediately when any monthly assessment shows failure, and interruption of fueling is scheduled immediately when a second consecutive monthly assessment shows failure.

9.11 UST Ullage Pressure - Pressure Integrity Failure (Leakage) Response

This test spans an actual or simulated period of two (2) weeks for failures where leakage exceeds the criteria as specified and two (2) weeks for borderline acceptable operation.

Induce or simulate unacceptable and borderline acceptable leakage of the vapor recovery system as described below, or UST ullage pressure behavior indicative of such leakage as the Executive Officer may find appropriate. Arrange induced or simulated conditions considering the ISD system's timing of weekly assessments of leakage based on UST ullage pressure. An alarm is scheduled immediately when any weekly assessment shows failure, and interruption of fueling is scheduled immediately when a second consecutive weekly assessment shows failure.

If leakage occurs at a rate twice the maximum that would occur if the system passed a TP-201.3 test and a five-percent (5%)-probable negative error in measurement of the leak rate is present, the system should alarm and interrupt fueling as scheduled. Manual re-enabling of fueling should be successful and events should be properly recorded by the system.

If leakage occurs at a rate equal to the maximum that would occur if the system passed a TP-201.3 test and a one-percent (1%)-probable positive error in measurement of the leak rate is present, the system should neither alarm nor interrupt fueling.

~~**9.12** UST Ullage Pressure - Phase I Overpressure Response~~

~~This test spans an actual or simulated period of 20 minutes for failures in which UST ullage pressure exceeds the criteria as specified and 20 minutes for borderline acceptable operation.~~

~~Induce or simulate unacceptable and borderline acceptable UST ullage pressure associated with Phase I deliveries as follows and verify appropriate system response. An alarm is scheduled immediately when assessment of any rolling 20-minute period shows failure. No interruption of fueling is scheduled.~~

~~If UST ullage pressure exceeds 2.5 inches of H_2O 25 percent (25%) of the time in any 20-minute period and a five-percent (5%)-probable negative error in measurement of UST pressure is present the system should alarm as scheduled.~~

~~If UST pressure is at the maximum level allowed by an applicable executive order (or at the 75th percentile pressure observed in representative Phase I deliveries where no applicable executive order specification exists) for twenty minutes and a one-percent (1%)-probable positive error in measurement of UST pressure is present the system should not alarm.~~

9.1~~3~~2 Vapor Processor Malfunction Response (Systems So Equipped Only)

This test spans an actual or simulated period of two (2) days for failures where vapor processor malfunction is indicated and two (2) days for borderline acceptable operation (if applicable).

Induce or simulate a vapor processor malfunction. Arrange induced or simulated conditions considering the ISD system's timing of daily assessments of vapor processor function. An alarm is scheduled immediately when any daily assessment shows malfunction, and interruption of fueling is scheduled immediately when a second consecutive daily assessment shows malfunction.

The system should alarm and disable fueling as scheduled when a malfunction is induced or simulated.

If detection of malfunction depends on quantitative measurements made by the ISD system, the Executive Officer shall specify an appropriate definition of borderline failure conditions. When such conditions are induced or simulated and a 5-percent (5%)-probable worst-case (positive or negative as applicable) error exists in quantitative measurements made by the ISD system the system should alarm and interrupt fueling as scheduled.

If detection of malfunction depends on quantitative measurements made by the ISD system, the Executive Officer shall specify an appropriate definition of borderline acceptable operating conditions. When such conditions are induced or simulated and a one-percent (1%)-probable worst-case (positive or negative as applicable) error exists in quantitative measurements made by the ISD system the system should not alarm or interrupt fueling.