California Environmental Protection Agency

Air Resources Board

Vapor Recovery Test Procedure

TP-202.1

Determination of Emission Factor of Vapor Recovery Systems of Bulk Plants

Adopted: April 12, 1996
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1 APPLICABILITY

A set of definitions common to all certification and test procedures is in:

D-200 Definitions for Certification Procedures and Test Procedures for Vapor Recovery Systems

For the purpose of this procedure, the term "ARB" refers to the State of California Air Resources Board, and the term "ARB Executive Officer" refers to the Executive Officer of the ARB or his or her authorized representative or designate.

The following test procedures shall be for determining the efficiency of vapor recovery systems controlling gasoline vapors emitted during loading of cargo tanks at the bulk plant, and during the filling of bulk plant storage tanks.

2 PRINCIPLE AND SUMMARY OF TEST PROCEDURE

2.1 Principle

At a bulk plant (during loadings of cargo tanks and filling of the storage tanks), all possible points of emission shall be checked for vapor leaks. The volume of gasoline delivered from the bulk plant storage tanks to the cargo tanks is recorded, the volume of gasoline delivered to any storage tank(s) is recorded (as required), and the mass of the hydrocarbon vapors emitted from the system are measured. The mass emission of hydrocarbons is calculated from these determinations and is expressed in units of pounds per 1,000 gallons.

2.2 Summary

As required to determine an emissions parameter and except where otherwise specified, the equipment and procedures specified in the following test methods shall be used.

EPA Method 2A

EPA Method 2B

EPA Method 18

EPA Method 25A

EPA Method 25B

2.3 Special Considerations

2.3.1 With prior written approval of the ARB Executive officer, careful visual reading and manual recording of data is acceptable in lieu of automatic sensing and recording procedures, where feasible.

2.3.2 If a determination is required for the fractional concentration of non-methane hydrocarbons or if a special molecular weight determination is required, integrated bag sampling and GC/FID analysis using EPA Method 18 shall be included in the procedures. The bag sample shall be obtained by continuous sampling at a fixed rate over (an) operating cycle(s) of the processing unit such that the sample bag is not completely filled at the end of the sample period(s).

If only the fractional concentration of non-methane hydrocarbons is required, then a NDIR calibrated to provide separate methane and non-methane values can be used.

2.3.3 Venting shall only be allowed during testing if all emissions of hydrocarbons from absolutely every vent source can be reliably quantified and included in emissions calculations; otherwise:

(1) If the vapor recovery system includes an incinerator-type processing unit, then that unit's exhaust is the only allowable emissions point.

(2) ~~Other processing units may have more than one exhaust, which must be equipped for alternating testing, should there not be an incinerator-type processing unit.~~ Processing units which do not utilize an incinerator may have more than one exhaust. If so, each exhaust must be equipped so that mass emissions can be quantified. For the purposes of the calculations specified in this method, any such processing unit emission points shall be treated as the "i^{th}" vent(s).

2.3.4 If there is no processing unit, then the tester shall determine the "i^{th}" vent with the apparent path of least resistance to venting the vapor recovery system to the atmosphere. Then the tester shall either seal any (all) other vent(s) or manifold any (all) other vent(s) so that the "i^{th}" vent is the only allowed emission point to the atmosphere. The test procedures then shall be performed using the "i^{th}" vent only.

3 BIASES AND INTERFERENCES

This section is reserved for future specification.

4 SENSITIVITY, RANGE, AND PRECISION

This section is reserved for future specification.

5 EQUIPMENT

5.1 Use rotary type positive displacement meter(s) or turbine meter(s), meeting the requirements of EPA Method 2A, and with a back pressure limit (BPL) less than:

1.10 inches water column at a flowrate of 3,000 CFH down to
0.05 inches water column at a flowrate of 30 CFH for a meter with a rating over 1000 CFH and

0.70 inches water column at a flowrate of 800 CFH down to
0.04 inches water column at a flowrate of 16 CFH for a meter with a rating of or under 1000 CFH.

Meter(s) shall be equipped with taps accommodating the following equipment:

(1) taps on the inlet side for

(a) a thermocouple with a range of 0 to 150 ^{o}F and

(b) a pressure gauge with a range providing absolute pressure readings within 10 to 90% of the range (more than one gauge shall be used, if necessary) and

(2) taps on the inlet and outlet sides for a differential pressure gauge with a range of 0 to < 2x BPL (i.e. full scale shall be less than twice the back pressure limit) or any other range appropriate to allow detection of a pressure drop greater than the BPL.

5.2 Coupler for the vapor vent line (when no processor is present) to accommodate the gas meter with thermocouple, pressure taps, and hydrocarbon analyzer sample and sample return taps. Coupler is to be sized for a minimum pressure drop.

5.3 Coupler for the exhaust of the secondary processing unit, if used, to accommodate the flow measuring device with the thermocouple, pressure and HC analyzer taps. Coupler is to be sized for a minimum pressure drop.

5.4 Coupler for the cargo tank vapor return line to accommodate the gas meter with thermocouple, pressure taps, and hydrocarbon analyzer sample and sample return taps. Coupler is to be the same diameter as the vapor return line.

5.5 Appropriate hydrocarbon analyzers (either FID, NDIR, GC/FID, or equivalent approved by the ARB Executive Officer) with recorders and with a capability of measuring total gasoline vapor concentration of 100 percent as propane.

Recorder strip charts shall be a minimum of 10 inches wide and be ruled with a minimum of 10 chart divisions per inch. Data loggers may only be used with prior approval of the ARB Executive Officer, who may require simultaneous use of strip chart recorders to cross check the validity of data recorded by the data loggers.

5.6 Three (3) flexible thermocouples or thermistors (0-250°F) with a recorder system.

5.7 Barometer.

5.8 Appropriate manometers or other pressure sensing devices capable of measuring system pressures.

5.9 Coupler for attaching PV valve to dry gas meter (Figure 1).

5.10 Explosimeter or combustible gas detector.

6 CALIBRATION PROCEDURE

6.1 Flow Meters. Standard methods and equipment shall be used to calibrate the flow meters.

6.2 Temperature Recording Instruments. Follow manufacturer's instructions.

6.3 Pressure Recording Instruments. Follow manufacturer's instructions.

6.4 Hydrocarbon Analyzer. Follow the manufacturer's instructions concerning warm-up time and adjustments. On each test day prior to testing and at the end of the day's testing, zero the analyzer and calibrate and span with appropriate calibration gases. Perform an intermediate zero and span calibration approximately 2 hours after the initial calibration and at any time a calibration drift is evident.

6.5 A record of all calibrations made shall be maintained.

7 PRE-TEST PROTOCOL

7.1 Specification of Test, Challenge, and Failure Modes

The specification of test, challenge, and failure modes such as the number of liquid transfer episodes, volume and volumetric rate of liquid transfer, storage tank volumes, etc. shall be done according to the principles of CP-202 § 5 for the testing and evaluation of vapor recovery equipment.

7.2 Transfer to Cargo Tank from Bulk Plant

7.2.1 Specific Pre-Test Protocol Items

During loading of a cargo tank at the bulk plant, direct measurements of hydrocarbon concentrations and volume of hydrocarbons vented (including emissions from any vapor processing unit) shall be made. All possible points of emission shall be checked for vapor leaks. The volume of gasoline dispensed to the cargo tank is recorded. The emission factor (pounds per 1,000 gallons liquid transferred) is calculated from these determinations.

7.2.2 Test Conditions

The number of cargo tank loadings to be tested shall be established at the discretion of the ARB Executive Officer based on an engineering evaluation, or a minimum of one delivery to the storage tank and one cargo tank loading operation shall be tested. The minimum volume for each delivery shall be 1000 gallons. The system shall be tested under normal operating conditions as close as possible, excluding dispensing of gasoline to vehicle fuel tanks. (Dispensing rates shall be at the maximum rate possible consistent with safe and normal operating practices; the processing unit, if any, shall be operated in accordance with the manufacturer's established parameters.)

7.3 Transfer to Bulk Plant from Cargo Tank

7.3.1 Specific Pre-Test Protocol Items

During a fuel delivery to the bulk plant, direct measurements of hydrocarbon concentrations and volume of hydrocarbon vapors vented (including emissions from any vapor processing unit) shall be made. All possible points of emission shall be checked for vapor leaks. The volume of gasoline delivered from the cargo tank is recorded.

7.3.2 Test Conditions

The number of transport deliveries to be tested shall be established at the discretion of the ARB Executive Officer based on an engineering evaluation of the system, or a minimum of one delivery shall be tested. As close as possible, the system shall be tested under normal operating conditions, excluding dispensing of gasoline to vehicle fuel tanks. (Dispensing rates shall be at the maximum rate possible consistent with safe and normal operating practices; the processing unit, if any, shall be operated in accordance with the manufacturer's established parameters.)

7.4 System and Facility Preparation

System equipment and components shall be completely operational and any storage tanks involved in the test shall be filled to the appropriate volume a minimum of 24 hours prior to the scheduled test.

In addition, the system and facility shall be prepared to operate according to any specified test, challenge, and failure modes.

The required preliminary evaluation shall set the final requirements for facility preparation. The dominant principle shall be that testing activities minimally alter facility and system conditions.

Install all equipment and wait until a cargo tank arrives. Until then, provide conditions which minimally disturb facility and system operations due to the presence of such equipment for such time.

8 TEST PROCEDURE

The facility and system shall be prepared to operate according to any specified test, challenge, and failure modes.

~~The use of pressure transducers is specified below for assessing whether out-breathing occurs from any system vents. Any other procedure, such as the use of bags to seal the vents so that volume of out-breathing into the bags can be observed, shall be used only after approval by the ARB Executive Officer.~~

The use of bags to seal the vents, so that volume of out-breathing into the bags can be observed, shall be used as the primary procedure for monitoring out-breathing. Any other procedure shall be used only after approval by the ARB Executive Officer.

For systems with multiple vents all system vents shall be monitored. Alternatively, if system vents are manifolded, then one vent may be monitored while the others are sealed with plastic bags. Attempt to monitor the vent with the least resistance to atmospheric emissions.

When bagging valves, do not seal vacuum valves or the vacuum side of pressure/vacuum valves. On any vacuum valves, use a combustible gas detector according to EPA Method 21 calibrated to the lower explosive limit for methane (21,000 ppm).

8.1 Transfer to Cargo Tank from Bulk Plant

See § 8.3 for incinerator test procedures.

8.1.1 Connect coupler to vent of bulk tank, or if the vent has a PV valve, remove the PV valve and then connect the coupler to the vent. If a secondary processing unit is used, also connect a coupler to the exhaust of the secondary processing unit.

8.1.2 Connect the appropriate gas meter, HC analyzer with recorder, thermocouple and pressure transducer to the vent coupler and connect the PV valve to the gas meter.

8.1.3 Connect a coupler to the bulk storage tank vapor return lines.

8.1.4 Connect bulk storage tank fill and vapor return lines to the cargo tank in accordance with owner or operator established procedures for the system.

8.1.5 Check the cargo tank and all connections for a tight seal with the explosimeter before and during the test.

8.1.6 Record the initial reading of the gas meter(s).

8.1.7 Start refueling the cargo tank in accordance with manufacturer's established normal procedure. (This step shall be performed by the owner, operator, or authorized representative.)

8.1.8 Hydrocarbon concentrations, temperature and pressure measurements shall be recorded starting after the first 15 seconds of the unloading period followed by 60 second intervals. The gas meter readings may be taken at 120 second intervals.

8.1.9 Record, during the test, barometric pressure and ambient temperature.

8.1.10 At the end of the cargo tank loading, disconnect the cargo tank from the bulk tank in accordance with owner's or operator's instructions (normal procedure). (This step shall be performed by the owner, operator, or authorized representative.)

8.1.11 Continue recording hydrocarbon concentrations, temperatures, pressure and gas meter readings at the bulk tank vent at about five-minute intervals until four consecutive intervals yield the same reading or until venting due to gasoline loading has stopped per the ARB Executive Officer's judgment.

8.1.12 Record final reading of gas meter.

8.1.13 Record volume of gasoline that is delivered.

8.1.14 Disconnect instrumentation from the vent.

8.1.15 Repeat procedure as necessary for additional cargo tank loading.

8.2 Transfer to Bulk Plant from Cargo Tank

See § 8.3 for incinerator test procedures.

8.2.1 Connect appropriate coupler to vent of bulk tank, or if the vent has a PV valve, remove the PV valve and then connect the coupler to the vent. If a secondary processing unit is used, also connect a coupler to the exhaust of the secondary

processing unit.

8.2.2 Connect the appropriate gas meter, HC analyzer with recorder, thermocouple and pressure transducer to the vent coupler and connect the PV valve to the gas meter.

8.2.3 Connect appropriate coupler to the cargo tank vapor return lines.

8.2.4 Connect cargo tank fuel and vapor return lines to appropriate bulk tank lines in accordance with the owner or operator's established procedures for the system.

8.2.5 Check the cargo tank and all connections for a tight seal before and during the test with the explosimeter.

8.2.6 Record the initial reading of the gas meter(s).

8.2.7 Start filling of the bulk tank in accordance with owner's or operator's established normal procedure. (This step shall be performed by the owner, operator, or authorized representative.)

8.2.8 Hydrocarbon concentrations, temperature and pressure measurements shall be recorded starting after the first 15 seconds of the filling period followed by 60 second intervals. The gas meter readings may be taken at 120 second intervals.

8.2.9 Record barometric pressure and ambient temperature during the test.

8.2.10 At the end of the bulk tank delivery, disconnect the cargo tank from the bulk tank in accordance with owner's or operator's instructions (normal procedure). (This step shall be performed by the owner, operator, or authorized representative.)

8.2.11 Continue recording hydrocarbon concentrations, temperatures, pressure and gas meter readings at the bulk tank vent at about five-minute intervals until four consecutive intervals yield the same volume reading or until venting due to gasoline loading has stopped per the ARB Executive Officer's judgment.

8.2.12 Record final reading of gas meter.

8.2.13 Record volume of gasoline that is delivered.

8.2.14 Disconnect instrumentation from the vent.

8.3 Test Procedures for Determining Incinerator Emissions

Incinerator emissions shall be determined using the procedures of EPA M-2B, as outlined in this procedure, including any additional requirements provided below.

Performance Specifications for Incinerators

Any incinerator shall be evaluated and tested to establish:

(1) a performance specification for ~~carbon monoxide (CO)~~ hydrocarbon (HC) emissions and

(2) performance specifications for other critical incinerator operating parameters:

The results of evaluation and testing of the system, documented in the certification test report, shall include:

(1) the identification of such critical system operating parameters,

(2) the performance specifications for such critical system operating parameters.

Challenge and failure mode testing shall be performed to establish system sensitivity to and performance specifications for the following variables:

(1) number of loading arms in simultaneous use and

(2) individual loading arm transfer rates. Challenge and failure mode testing on individual loading arm transfer rates shall only be required if the system is designed to operate at widely variable transfer rates.

Compliance with the incinerator performance specifications shall be determined per CP-202.

Parameters for Incinerator Data Collection

Collect and record incinerator data for all of the parameters required to make a determination per EPA M-2B, with additional requirements for auxiliary fuel to expand the applicability of EPA M-2B:

V_{in}	=	total inlet volume entering vapor incinerator (SCF)
$V_{facility}$	=	inlet volume from the facility vapor space (SCF)
V_{fuel}	=	inlet volume of auxiliary fuel (SCF)
V_{out}	=	vapor incinerator outlet volume (SCF)
N	=	number of carbon atoms in each molecule of calibration gas

$[HC]_{facility}$ = hydrocarbon concentration of inlet volume from the facility vapor space (volume fraction)

$[HC]_{fuel}$ = hydrocarbon concentration of auxiliary fuel (volume fraction)

$[HC]_{out}$ = vapor incinerator outlet hydrocarbon concentration (ppm)

$[CO_2]$ = vapor incinerator outlet carbon dioxide concentration (ppm)

[CO] = vapor incinerator outlet carbon monoxide concentration (ppm)

Based on an engineering evaluation of a subject incinerator, the ARB Executive Officer may allow simplifying assumptions to be used in place of actual data collection. ~~For example, for auxiliary fuel, it is often possible to use data from the fuel supplier.~~ For example, the volumetric flow rate of auxiliary fuel can often be established from specifications provided by the incinerator manufacturer and the concentration of auxiliary fuel from data available from the fuel supplier.

Resolution for Incinerator Data Collection

~~Apreliminary evaluation of incinerator operation shall be conducted to determine data collection intervals for time and parameter magnitude for each parameter.~~ A preliminary evaluation of incinerator operation shall be conducted to assess the rate of change of the magnitude of measured parameters. An appropriate time interval for data recording shall be determined. Such intervals shall be chosen to provide calculated estimates of incinerator mass emissions factors which differ by no more than ± 10% from actual, based on engineering judgment.

Data for each parameter shall be collected on such intervals.

9 QUALITY ASSURANCE / QUALITY CONTROL (QA/QC)

Calibration Gases

Calibration gases are classified into three types:

(1) **Standard Reference Materials**

These are **primary standards** to which all other standards shall be traceable. For any substance for which no standard reference material is obtainable, a calibration gas of the highest level of accuracy and precision obtainable shall qualify as a standard reference material, subject to approval by the ARB Executive Officer.

A standard reference material, which normally is kept at a main laboratory, qualifies as an intermediate standard and as a working standard, too.

(2) **Intermediate Standards**

These are **secondary standards** which shall be assayed versus the corresponding NIST-SRM once every six months with a concentration difference which is no more than one percent of the results for the NIST-SRM. An intermediate standard container which does not meet its assay requirement shall be taken out of service. To re-enter service, the intermediate standard container shall be recharged and meet its assay requirement.

An intermediate standard, which normally is kept at a branch laboratory or a shop, qualifies as a working standard, too.

(3) **Working Standards**

These are **tertiary standards** which shall be assayed versus the corresponding intermediate standard before every test with a concentration difference which is no more than one percent of the results for the intermediate standard. A working standard container which does not meet its assay requirement shall be taken out of service. To re-enter service, the working standard container shall be recharged and meet its assay requirement.

A working standard normally serves for field calibration and testing.

All calibrations shall be performed with a calibration gas of at least working standard quality. Any cylinder is to be recharged or taken out of service when the cylinder pressure drops to 10 percent of the original pressure.

Information on calibration gas containers shall be entered into a permanent log identifying each container by serial number. Sufficient information shall be maintained to allow a determination of the compliance status of each calibration gas per these requirements; such information shall include for each container, but not be limited to each:

(1) date put in service,
(2) assay result, and
(3) date taken out of service.

10 RECORDING DATA

This section is reserved for future specification.

11 CALCULATING RESULTS

11.1 Transfer to Cargo Tank from Bulk Plant

11.1.1 Review pressures recorded during the loading of cargo tanks to determine if any equalled or exceeded 18 inches H_2O gauge pressure. Record and report such instances.

11.1.2 Volume of gas discharged through the system exhaust.

See § 11.3 for calculation of volume from an incinerator.

$$V = V_p \left(\frac{528}{T_p} \right) \left(\frac{P_b + \left(\frac{P}{13.6} \right)}{29.92} \right)$$

where:

V = Volume of gas discharged, ft^3, through processor exhaust, corrected to 68°F and 29.92 "Hg;

P_b = Barometric pressure, "Hg.

P = Gauge pressure at exhaust coupler, "WC.

V_p = Volume of gas determined by flowmeter on the processing exhaust, corrected for amount of vapor removed for the hydrocarbon analysis, ft^3.

T_p = Average temperature in the processing exhaust line, °R.

11.1.3 Weight of hydrocarbons discharged through the processing exhaust per 1000 gallons of gasoline loaded into the cargo tanks.

$$W = \frac{(C)\ (V)\ (M)}{385\ (G)}$$

where:

W = Weight of hydrocarbons discharged through the processor exhaust per 1000 gallons of gasoline loaded into cargo tanks, lb_m.

C = Average fractional concentration of hydrocarbons at exhaust (decimal fraction). This may be adjusted to represent non-methane hydrocarbons if the procedure includes a methane/non-methane hydrocarbon determination by integrated bag sampling and GC/FID analysis.

V = From (11.1.2) above.

M = Molecular weight of exhaust hydrocarbons which shall be assumed equal to that of the gas(es) used to calibrate the organic analyzer unless the procedure includes a molecular weight determination by integrated bag sampling and GC/FID analysis, (lb_m/lb-mole).

385 = Molar volume, (ft^3/lb-mole)

G = Total quantity of gasoline loaded into cargo tanks, (total gallons loaded/1000).

11.2 Transfer to Bulk Plant from Cargo Tank

11.2.1 Volume of gas discharged through the system exhaust.

See § 11.3 for calculation of volume from an incinerator.

$$V = V_p \left(\frac{528}{T_p} \right) \left(\frac{P_b + \left(\frac{P}{13.6} \right)}{29.92} \right)$$

where:

V = Volume of gas discharged ft , through processor exhaust, corrected to 68°F and 29.92 "Hg;

P_b = Barometric pressure, "Hg.

P = Gauge pressure at exhaust coupler, "WC.

V_p = Volume of gas determined by flowmeter on the processing exhaust, corrected for amount of vapor removed for the hydrocarbon analysis, $ft.^3$

T_p = Average temperature in the processing exhaust line, °R.

11.2.2 Weight of hydrocarbons discharged through the processing exhaust per 1000 gallons of gasoline loaded into the cargo tanks.

$$W = \frac{(C)\ (V)\ (M)}{385\ (G)}$$

where:

W = Weight of hydrocarbons discharged through the processor exhaust per 1000 gallons of gasoline loaded into cargo tanks, lb_m.

C = Average concentration of hydrocarbons at exhaust (decimal fraction). This may be adjusted to represent non-methane hydrocarbons if the procedure includes a methane/non-methane hydrocarbon determination by integrated bag sampling and GC/FID analysis (or equivalent approved by the ARB Executive Officer).

V = From (11.1.2) above.

M = Molecular weight of exhaust hydrocarbons which shall be assumed equal to that of the gas(es) used to calibrate the organic analyzer unless the procedure includes a molecular weight determination by integrated bag sampling and GC/FID analysis, (lb_m/lb-mole).

385 = Molar volume, (ft^3/lb-mole), at standard conditions

G = Total quantity of gasoline loaded into cargo tanks, (total gallons loaded/1000).

11.3 Volume for Incinerator

Note the possibility for simplifying assumptions described in § 8.3.

11.3.1 Preliminary Incinerator Outlet Volume Calculations

Before calculating the vapor incinerator outlet volume, calculate the following preliminary values:

(1) inlet volume from the facility vapor space

Any inlet volume from the facility vapor space entering the vapor incinerator is directly measured and shall be standardized per § 11.2.1.

(2) Inlet volume auxiliary fuel

Any inlet volume from auxiliary fuel entering the vapor incinerator is directly measured and shall be standardized per § 11.2.1.

(3) total inlet volume entering vapor incinerator

$$V_{in} = V_{facility} + V_{fuel}$$

where:

V_{in} = total inlet volume entering vapor incinerator (SCF)

$V_{facility}$ = inlet volume from the facility vapor space (SCF)

V_{fuel} = inlet volume of auxiliary fuel (SCF)

(4) inlet hydrocarbon concentration

$$[HC]_{in} = \frac{(N\ [HC]_{facility}\ V_{facility}) + (N\ [HC]_{fuel}\ V_{fuel})}{V_{in}}$$

where:

$[HC]_{in}$ = inlet hydrocarbon concentration entering vapor incinerator (ppm)

N = number of carbon atoms in each molecule of calibration gas

11.3.2 Final Incinerator Outlet Volume Calculations

Calculate any vapor incinerator outlet volume using the following equation:

$$V_{out} = V_{in}\left(\frac{[HC]_{in}}{N\ [HC]_{out} + [CO_2] + [CO] - 300}\right)$$

where:

V_{out} = vapor incinerator outlet volume (SCF)

N = number of carbon atoms in each molecule of calibration gas

$[HC]_{out}$	=	vapor incinerator outlet hydrocarbon concentration (ppm)
$[CO_2]$	=	vapor incinerator outlet carbon dioxide concentration (ppm)
[CO]	=	vapor incinerator outlet carbon monoxide concentration (ppm)
300	=	assumed background concentration (ppm) of CO_2

12 REPORTING RESULTS

This section is reserved for future specification.

13 ALTERNATIVE TEST PROCEDURES

Test procedures, other than specified above, shall only be used if prior written approval is obtained from the ARB Executive Officer. In order to secure the ARB Executive Officer's approval of an alternative test procedure, the applicant is responsible for demonstrating to the ARB Executive Officer's satisfaction that the alternative test procedure is equivalent to this test procedure.

(1) Such approval shall be granted on a case-by-case basis only. Because of the evolving nature of technology and procedures for vapor recovery systems, such approval shall not be granted in subsequent cases without a new request for approval and a new demonstration of equivalency.

(2) Documentation of any such approvals, demonstrations, and approvals shall be maintained in the ARB Executive Officer's files and shall be made available upon request.

14 REFERENCES

This section is reserved for future specification.

15 FIGURES

This section is reserved for future specification.