

California Environmental Protection Agency

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**Vapor Recovery Certification Procedure**

CP - 201

**CERTIFICATION PROCEDURE FOR  
VAPOR RECOVERY SYSTEMS OF  
DISPENSING FACILITIES**

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*The method is being amended. For ease of viewing, the method is shown as repealed text and proposed text.*

CP-201

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**California Environmental Protection Agency  
Air Resources Board**

**Vapor Recovery Certification Procedure**

**CP-201**

**Certification Procedure for Vapor Recovery Systems of  
Dispensing Facilities**

**1 GENERAL INFORMATION AND APPLICABILITY**

This document describes a procedure for certifying equipment which recovers vapors emitted in association with gasoline marketing operations involving a dispensing facility.

Other vapor recovery certification procedures provide instructions for determining performance standards, performance specifications, and test procedures for equipment which recovers vapors emitted in association with gasoline marketing operations involving: bulk plants and cargo tanks (CP-202); supply lines, terminals, delivery lines, and cargo tanks (CP-203); and cargo tanks (CP-204). For novel facilities or systems to which CP-201 through 204 do not apply, CP-205 provides instructions for determining performance standards, performance specifications, and test procedures for equipment which recovers vapors emitted in association with gasoline marketing operations.

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**

Whenever these Certification Procedures are amended to include additional performance standards, any system which is certified as of the effective date of the additional standards or requirements shall remain certified for a period of six months from such date, or until the Executive Officer has determined whether the system conforms to the additional standards or requirements, whichever occurs first. However, if during this period the system manufacturer does not comply with such conditions as the Executive Officer deems necessary to assure prompt evaluation of the system pursuant to the additional standards

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or requirements, the Executive Officer may revoke the prior certification.

In determining whether a previously certified system conforms with any additional performance standards or other requirements adopted subsequent to certification of the system, the Executive Officer may consider any appropriate data obtained in the previous certification testing or evaluation of the system in lieu of new testing or evaluation.

These certification procedures are adopted pursuant to Section 41954 of the Health and Safety Code and are applicable to vapor recovery systems installed at gasoline service stations for controlling gasoline vapors emitted during the filling of storage tanks (Phase I) and vehicle fuel tanks (Phase II). Vapor recovery systems are complete systems and shall include all necessary piping, nozzles, couplers, processing units, underground tanks and any other equipment necessary for the control of gasoline vapors during fueling operations at service stations.

The certification procedures are not intended to be used to certify individual system components. For systems which are identical in design and include the same components as systems tested and certified, but differ, primarily in size, the applicant shall demonstrate compliance capability and obtain certification by submitting engineering and test data demonstrating the relationship between capacity and throughput of each component whose performance is a function of throughput.

1.1 Legislative and Regulatory Requirements of  
Other California State Agencies

As required, the ARB Executive Officer shall coordinate this certification procedure with:

- (1) Department of Food and Agriculture,  
Division of Measurement Standards (DMS)
- (2) State Fire Marshal (SFM)
- (3) Department of Industrial Relations,  
Division of Occupational Safety and Health (DOSH)

Certification of a system by the ARB Executive Officer does not exempt the system from compliance with other applicable codes and regulations such as state fire codes, weights and measure regulations, and safety codes and regulations.

Prior to certification of the vapor recovery system by the ARB Executive Officer, plans and specifications for the system shall be submitted by the applicant to the SFM for review to determine whether the system creates a hazardous condition or is contrary to adopted fire safety regulations. Final determination by the SFM may be contingent upon a review of each pilot installation of the

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proposed system. Compliance with the SFM requirements shall be a precondition to certification by the ARB Executive Officer.

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Prior to certification of the vapor recovery system by the ARB Executive Officer, plans and specifications for the system shall be submitted by the applicant for type approval and certification to DMS. Only those systems meeting the requirements of the California Business and Professions Code and the CCR will be issued certificates of approval by DMS; such certification shall be a precondition to certification by the ARB Executive Officer. Certification testing by DMS and the ARB Executive Officer may be conducted concurrently.

Prior to certification of the vapor recovery system by the ARB Executive Officer, plans and specifications for the system shall be submitted by the applicant to DOSH for determination of compliance with appropriate safety regulations. This may be conducted concurrently with certification testing by the ARB Executive Officer. Compliance with DOSH requirements shall be a precondition to certification by the ARB Executive Officer.

1.2 Legislative and Regulatory Requirements of Other Agencies

In addition to California's local Districts, other federal, state, or local agencies may have legal jurisdiction regarding vapor recovery systems. The applicant is solely responsible for:

- (1) compatibility of the applicant's equipment with the application of any other agency's test procedures;
- (2) testing of the applicant's equipment with such test procedures; and
- (3) compliance with performance standards and performance specifications in any other agency's regulations referencing such test procedures.

The ARB Executive Officer is not responsible for items (1) through (3) above.

**2 SUMMARY OF CERTIFICATION PROCESS**

2.1 Summary of Requirements of Certification Procedure

This certification procedure has five interacting components which may be applied iteratively in complex cases. For example, review of evaluation and testing may yield additional specifications. The five components are:

2.1.1 Application for Certification (See § 3.)

The applicant must submit all required application information. The ARB Executive Officer shall consult with the applicant, shall review the information, may require revisions or more information, and shall approve the application after it is determined to be complete.

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2.1.2 Standards, Specifications, and Test Procedures (See § 4.)

The ARB Executive Officer shall specify performance standards, performance specifications, and test procedures for vapor recovery equipment in response to a completed application for certification.

2.1.3 Evaluation and Testing of Vapor Recovery Equipment (See § 5.)

The vapor recovery equipment shall be subjected to evaluation and testing according to the performance standards, performance specifications, and test procedures at the applicant's expense. The ARB Executive Officer shall conduct all evaluation and testing unless the ARB Executive Officer determines that the equipment owner or operator shall contract for or conduct specified evaluation and testing on a case-by-case basis. 2.1.4 Documentation for Certification (See § 6.)

A Certification Report shall be prepared, at the applicant's expense, documenting the preceding components:

- (1) Application for Certification;
- (2) Standards, Specifications, and Procedures; and
- (3) Evaluation and Testing of Vapor Recovery Equipment.

The ARB Executive Officer shall consult with the applicant, shall review the report, may require additional work on the components, and shall approve and sign the Certification Report after it is determined that:

- (1) The Certification Report is complete; and
- (2) The Certification Report documents successful performance of the subject vapor recovery equipment according to the required performance standards, performance specifications, and test procedures.

2.1.5 Certification (See § 7.)

Evidence of certification shall be an ARB Executive Order (which shall reference the Certification Report) signed by the ARB Executive Officer.

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2.2 Summary of Time Periods for Review and Processing

The following definitions of ARB Executive Officer Actions and Time Periods shall apply to all applications subject to this procedure per CCR, Title 17, § 60030:

**"ARB Executive Officer Interim Action #1"**

means that the ARB Executive Officer determines that application is deficient per § 3, § 4, § 5, or § 6 and communicates specific deficiencies to the Applicant in writing.

**"ARB Executive Officer Interim Action #2"**

means that the ARB Executive Officer determines that application is complete per § 3, § 4, § 5, and § 6 and accepted for filing and communicates such determination to Applicant in writing.

**"ARB Executive Officer Final Action"**

means that the ARB Executive Officer acts to disapprove or approve the application per § 3, § 4, § 5, § 6, and § 7 and communicates such determination to the Applicant in writing.

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**"Time Periods"**

are defined in the table below:

<b>FROM: ACTION BELOW</b>	<b>TIME PERIOD</b>	<b>TO: ACTION BELOW</b>
Applicant files an initial application for certification.	within 30 days	ARB Executive Officer Interim Action #1 or #2
Applicant files an amended application for certification.	within 15 days	ARB Executive Officer Interim Action #1 or #2
ARB Executive Officer Interim Action #2	within 90 days	ARB Executive Officer Final Action

The time periods specified above may be extended by the ARB Executive Officer for good cause per CCR, Title 17, § 60030 (d).

**3 APPLICATION FOR CERTIFICATION**

**Warning:** All of the information specified in all of the following subsections must be submitted to the ARB Executive Officer for an application to be considered complete.

Applications which do not completely satisfy the requirements of this section shall be returned to the applicant with an indication of deficiencies.

3.1 General

- 3.1.1 An application for certification of a vapor recovery system (Phase I or Phase II) may be made to the ARB Executive Officer by any applicant.

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- 3.1.2 The application shall be in writing, signed by an authorized representative of the applicant, and shall include the following:
- (1) A detailed description of the configuration of the vapor recovery system including but not limited to the following:
    - (a) The underground plumbing and tankage configuration and specifications (pipe sizes, lengths, fittings, volumes, material(s), etc.);
      - (i) drawings of the intended system before installation;
      - (ii) drawings of the actual system after installation;
    - (b) Gasoline dispensing nozzle to be used for Phase II;
    - (c) Engineering parameters for pumps and vapor processing units to be used as part of the vapor recovery system; and
    - (d) Allowable pressure drops through the system.
  - (2) Evidence demonstrating the vapor recovery reliability of the system or device for a minimum of 90 days;
  - (3) A description of tests performed to ascertain compliance with the general standards, and the results of such tests;
  - (4) A statement of recommended maintenance procedures, equipment performance checkout procedures, and equipment necessary to assure that the vapor recovery system, in operation, conforms to the regulations, plus a description of the program for training personnel for such maintenance, and the proposed replacement parts program;
  - (5) Two copies of the service and operating manuals that will be supplied to the purchaser;
  - (6) A statement that a vapor recovery system, installed at an operating facility, will be available for certification testing no later than one month after submission of the application for certification. The facility submitted for certification testing shall have a minimum throughput of 100,000 gallons per month and shall include at least six nozzles of each type submitted for approval. There shall not be more than two types of nozzles connected to a common vapor volume.

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- (7) The estimated retail price of the system and separate estimates of both the installation and yearly maintenance costs;
- (8) A copy of the warranty or warranties provided with the system;
- (9) If the application is for a system previously tested, but not certified, the application shall include identification of the system components which have been changed; including all new physical and operational characteristics; together with any new test results obtained by the applicant.
- (10) Such other information as the Executive Officer the ARB Executive Officer may reasonably require.

3.2 Evidence of Corporate and Financial Responsibility

The requirements of this section shall apply with equal stringency both to original manufacturers and to rebuilders of vapor recovery equipment.

Any manufacturer of vapor recovery system equipment shall provide a warranty of at least one year for the system equipment.

The manufacturer of any vapor recovery system equipment shall warrant in writing to the ultimate purchaser and each subsequent purchaser that such vapor recovery system equipment is:

- (1) Designed, built, and equipped so as to conform at the time of sale with the applicable regulations; and
- (2) Free from defects in materials and workmanship which cause such vapor recovery system to fail to conform with applicable regulations for at least one year.

The adequacy of methods of distribution, replacement parts program, the financial responsibility of the manufacturer, the financial responsibility of the applicant, and other factors affecting the economic interests of the system purchaser shall be evaluated by the ARB Executive Officer and determined by him or her to be satisfactory to protect the purchaser. A determination of financial responsibility by the ARB Executive Officer shall not be deemed to be a guarantee or endorsement of the manufacturer or applicant.

A fee not to exceed the actual cost of certification will be charged by the ARB to each applicant

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submitting system(s) for certification. The applicant is required to demonstrate ability to pay the cost of testing prior to certification and performance testing. This may take the form of posting a bond of not less than \$20,000. An Executive Order certifying the system will not be issued until the test fee has been paid in full to the ARB.

3.3 Design

3.3.1 Engineering Drawings

The applicant shall submit engineering drawings for:

- (1) each prototype vapor recovery system and
- (2) all equipment components of each prototype system.

For any component, in lieu of a component drawing, the applicant can submit an affidavit declaring:

- (1) the manufacturer's model number for the component and
- (2) the applicant's commitment to maintain, on file, engineering drawings for such component.

3.3.2 List of Components by Manufacturer and Model Number

The applicant shall submit a list of components by manufacturer and model number for the vapor recovery system.

3.3.3 Indicating Gauges, Detection Devices, and Alarms

Indicating gauges, detection devices, alarms, or combination thereof, shall be included in each control system as required to enable monitoring of the critical system operating parameters. The gauges and alarms shall serve to alert and warn the gasoline service station owner or operator with an audible signal or warning light when the gasoline vapor control system is malfunctioning. Such gauges and alarms shall, as applicable, include temperature and pressure indicators, pass/fail hydrocarbon detectors, etc. These shall indicate the performance of critical components such as aspirators, vacuum pumps, incinerators, compressors, carbon canisters, etc.

Specific examples of necessary devices are: temperature indicators installed in control systems

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which utilize refrigeration as a control technique; pressure indicators installed in control systems which utilize compression as a control technique; hydrocarbon breakthrough detectors installed in control systems which utilize carbon adsorption or flexible bladders or seals as a control technique, and pressure differential indicators on vapor return lines to detect liquid blockage of the lines.

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, and
- (3) the specification of requirements for indicating gauges, detection devices, and alarms.

3.4 Installation, Operation, Maintenance, and Inspection

3.4.1 Compliance Conditions for Facility and System

The specification of a matrix of compliance conditions for installation, operation, maintenance, and inspection for any facility using a vapor recovery system certified by this procedure is a crucial part of the certification process. Such a matrix shall form a limiting envelope inside which are conditions of compliance and outside which are conditions of violation. Certification testing shall be conducted to characterize the facility and system inside this limiting envelope. More detail is provided below and in § 5.

The applicant shall submit an Installation, Operation, and Maintenance Manual and an Inspection Manual which provide clear, detailed, step-by-step instructions for installation, operation, maintenance, and inspection of a vapor recovery system at a dispensing facility. Such manuals shall be written so that, with regard to the compliance conditions imposed by this procedure:

- (1) when such instructions are followed by facility owners and operators, or their contractors, a system will meet its compliance conditions, barring unforeseen design or equipment failure and
- (2) when such instructions are followed by facility owners and operators, or their contractors, or inspecting agencies any violation of compliance conditions by a system will be detected, barring intermittent problems.

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The Installation, Operation, and Maintenance Manual and the Inspection Manual shall be subject to review and processing per § 2.2. A preliminary engineering evaluation shall be performed per § 5 to determine any deficiencies in either manual. Any such deficiencies, which can be remedied before official certification testing for the performance standard with a representative vehicle matrix, shall be so remedied. Any other deficiencies determined before, during, or after such official certification testing shall be remedied before certification per § 7.

To further augment compliance efforts by facility owners and operators, or their contractors, and by inspecting agencies, the ARB Executive Officer may, at any time before or after certification per § 7, add or delete instructions from either manual and distribute revised manuals.

At the applicant's option, the two manuals may be bound under one cover but separate sections must be written to meet their distinct requirements as specified below.

3.4.2 Installation, Operation, and Maintenance Manual

Two copies of an installation, operation, and maintenance manual shall be submitted to the ARB Executive Officer for each vapor recovery system submitted for certification. The manual shall, at a minimum, contain:

- (1) Identification of critical operating parameters affecting system operation, e.g., maximum dispensing rates; liquid to vapor flow rate ratios, or the inverse of such ratios; air to liquid volumetric ratios; pressures; etc. The operating range of these parameters associated with normal, in-compliance operation of the control system shall be identified. These operating data shall be determined and/or verified during the period of certification and performance testing of the system.
- (2) Identification of specific maintenance requirements and maintenance schedules necessary to ensure on-going operation in compliance with the applicable standards. Maintenance requirements shall be clearly identified as being capable of performance by the operator, or as requiring authorized service only. Operating manuals shall provide clear instruction on operator maintenance and shall provide clear warnings against unauthorized service. Maintenance schedules shall, at a minimum, reflect the life of individual components such as regulators, compressors, nozzles, pressure vacuum valves, catalysts, combustor components, etc. Systems requiring maintenance which the Executive Officer finds unreasonable will be disapproved.
- (3) Identification of system components for each control system certified. Components shall, as

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applicable, be identified by brand name, part number, and/or performance characteristics. The identification shall be sufficiently clear so as to allow determination of comparability between tested and untested models, and/or to allow determination of the adequacy of replacement parts.

- (4) A warranty statement which complies with the requirements of § 3.2.
- (5) All pages with an 8.5 x 11 inch format with holes for a standard 3-ring binder.

3.4.3 Inspection Manual

Two copies of an inspection manual shall be submitted to the ARB Executive Officer for each vapor recovery system submitted for certification. The manual shall, at a minimum, contain:

- (1) Step-by-step instructions for inspecting a vapor recovery system for installation, operation, and maintenance; including:
  - (a) instructions for performing test procedures for inspection, with specific details for such vapor recovery system including, but not limited to:
    - (i) accessing equipment for inspection testing,
    - (ii) preparing equipment for inspection testing,
    - (iii) subjecting equipment to inspection testing, and
    - (iv) returning equipment to pre-inspection status;
  - (b) test procedures for inspection;
  - (c) references for each test procedure for inspection either to:
    - (i) an ARB adopted or alternative test procedure or
    - (ii) another test procedure submitted by the applicant; and
- (2) all pages with an 8.5 x 11 inch format with holes for a standard 3-ring binder.

3.5 Compatibility

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This section specifies vapor recovery system compatibility requirements which, although not specified in terms of vapor recovery effectiveness, form an indispensable basis for proceeding with the application of the appropriate certification and test procedures.

These compatibility requirements are necessary because the plumbing and pumping equipment and systems for vapors and liquids at a dispensing facility constitute an integral part of the vapor recovery system associated with such facility.

Phase II systems must be capable of fueling, without the use of nozzle spout extenders, any motor vehicle that may be fueled at service stations not equipped with vapor recovery systems.

3.5.1 Vapor Recovery System and Equipment

The installation, operation, and maintenance of a vapor recovery system and equipment must be compatible with:

- (1) the application of performance standards, performance specifications, and test procedures;
- (2) the existence of a two inch minimum inside diameter for vapor plumbing or a certified back pressure performance specification; and
- (3) the installation, operation, and maintenance of any other dispensing facility equipment or systems associated with such vapor recovery system.

Requirement (2) above applies without exception to all new installations, as defined in D-200.

3.5.2 Dispensing Facility Equipment and Systems

The installation, operation, and maintenance of the equipment and systems at a dispensing facility with an installed vapor recovery system and equipment must be compatible with:

- (1) the application of performance specifications and test procedures;
- (2) the existence of a two inch minimum inside diameter for vapor plumbing or a certified back pressure performance specification; and
- (3) the installation, operation, and maintenance of any other aspects of the vapor recovery system or equipment associated with such dispensing facility.

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**4 PERFORMANCE STANDARDS,  
PERFORMANCE SPECIFICATIONS, AND TEST PROCEDURES**

**Warning:** The installation, operation, maintenance, and inspection of a vapor recovery system must be compatible with:

- (1) the application of specified performance standards, performance specifications, and test procedures and
- (2) the installation, operation, maintenance, and inspection of any other equipment associated with such system.

4.1 Performance Standards and Test Procedures

4.1.1 Efficiency

4.1.1.1 Performance Standard

A vapor recovery system shall achieve a minimum vapor recovery efficiency of ninety percent (90%) by weight to obtain certification by this procedure.

In the application, the applicant shall specify whether the system is to be certified at 90% or 95% efficiency.

Compliance with the performance standard specified in the application shall be determined separately for Phase I and Phase II operation of the system.

4.1.1.2 Test Procedures

The vapor recovery system Phase I efficiency shall be determined per:

**TP-201.1  
TP-201.1A  
TP-201.3**

The vapor recovery system Phase II efficiency shall be determined per:

**TP-201.2  
TP-201.2A**

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**TP-201.3**

A representative vehicle matrix shall be used when testing to determine the Phase II efficiency for the performance standard. The composition of the representative vehicle matrix shall be determined for each calendar year by the ARB Executive Officer per:

**TP-201.2A**

A total of 100 vehicles are required to be tested for determining the efficiency of Phase II system. A revised matrix will be issued by the ARB Executive Officer each calendar year. Vehicles will be tested as they enter the dispensing facility ("first in" basis) until a specific matrix block of the distribution is filled.

The ARB Executive Officer may contingently exclude a vehicle prior to its dispensing episode only if such exclusion and its reason is documented; e.g. unusual facility conditions beyond the applicant's control or unusual modifications to the vehicle. All data required by the test procedure shall be taken for such vehicles for subsequent review and possible reversal of the exclusion decision made during the test. The only other reasons for excluding a vehicle from the test fleet are incomplete data or the factors in TP 201.2 § 3.

One of two options shall be exercised at the test site according to the judgment of the ARB Executive Officer; each option is designed to reasonably control testing costs and yet not provide unfair advantage to any applicant:

- (1) Additional vehicles may be chosen for testing at the test site by the ARB Executive Officer. The vehicles shall be chosen, according to the ARB Executive Officer's judgment, so that any of the first 100 vehicles, which may later be found to have invalid data associated with them, shall have replacements from among the additional vehicles on a "first in" basis. Historically, a provision such as this has been found to reduce the need for re-testing which is usually more costly to the applicant than extending the test set by ten vehicles.
- (2) A matrix of fewer than 100 vehicles may be made by deleting up to a maximum of three vehicles by reducing the representation in any cell or combination of cells of the vehicle matrix, subject to the following requirements for each candidate reduced cell:
  - (a) no cell shall be reduced by more than one vehicle;
  - (b) at least one dispensing episode has already been tested in each such cell;

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(c) each and every tested dispensing episode in such cell have yielded field data which, according to the ARB Executive Officer's judgment, indicate a vapor recovery efficiency of at least 90% (or 95%, as appropriate per § 4.1) will be the eventual test result for each and every such episode calculated as an individual dispensing episode per TP-201.2; and

(d) all tested dispensing episodes in all cells have yielded field data which, according to the ARB Executive Officer's judgment, would yield valid test results after subsequent review and evaluation.

4.1.2 Continuous Operation

4.1.2.1 Performance Standard

Each vapor recovery system shall be required to comply with a performance standard for continuous operation tests. The continuous operation test must demonstrate to the satisfaction of the ARB Executive Officer that:

based on an engineering evaluation of the system's component qualities, design, and performance on all tests required by this certification procedure and

based on an assumption of compliance with all installation, operation, and maintenance procedures required by this certification procedure;

the system can be expected to comply with the system's certification requirements over the system's one-year warranty period for any installation of the system.

The minimum requirements for certification are provided in this certification procedure. The following clarifications are intended to provide guidance and answers to commonly asked questions and to correct common misunderstandings about the continuous performance standard; these clarifications shall not be interpreted as reducing the stringency of any other certification requirements:

- (1) The continuous performance tests shall consist of at least one operational test of at least ninety days; however, this is not necessarily a requirement for a "90-day test" (a commonly misunderstood term, the use of which shall not be interpreted as reducing the stringency of any certification requirement). Rather, this requirement is for at least one test of at least ninety days duration.

The continuous performance tests are not research and development (R&D) or "shakedown" opportunities for "tuning" the system or the components. Any R&D, shakedown, or tuning activities must precede an operational test. Following any such activities, the system shall be sealed for the duration of any operational test.

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- (2) During any operational test, the system is observed in normal operation for a period of at least ninety days. This is a relatively short time in which to determine whether the system is sufficiently reliable to merit certification.

It is sometimes necessary to conduct more than one operational test to demonstrate that the system, with modifications to solve contingent problems, performs adequately. A new test shall be initiated only after investigation of the cause of such problems and the implementation of attempted solutions, all of which shall be considered as R&D, shakedown, or tuning activities activity.

- (3) The facility participating in a continuous performance test must meet the following requirements before the results of a subsequent efficiency test procedure can be considered acceptable for engineering evaluation:

(a) The facility shall be prepared to host all necessary tests. The aggregate duration of such tests can not be predicted precisely in advance, but must be at least 90 days.

(b) The facility must be approved as a test site by the ARB Executive Officer before any uncertified equipment may be installed.

(c) The facility throughput shall be at least 100,000 gallons per month. Providing verification of throughput for the duration of the test period is the responsibility of the applicant, in co-operation with the facility.

(d) The facility shall use no more than two types of components (e.g. nozzles). If system performance can be affected by the type of nozzle, or by any other component type, the entire facility shall be required to have identical components of such type.

- (4) The vapor recovery system participating in a continuous performance test must meet the following requirements before the results of a subsequent efficiency test procedure can be considered acceptable for engineering evaluation:

(a) the vapor recovery system shall demonstrate compliance with the requirements of the static pressure performance specification and:

(i) prior to any acceptable continuous performance test, the system shall be sealed in such a manner that unauthorized maintenance or adjustment can be detected by superficial visual inspection;

(ii) no replacement of components or alteration of the control system is allowed (except with the consent of the ARB Executive Officer for damage due to an accident or vandalism); and

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- (iii) no maintenance or adjustment to the system shall be allowed during the certification test unless such action is specifically called for in the system's maintenance manual. An exception to this may be made for adjustments which do not affect reliability for the purpose of adjusting the air to liquid (A/L) volume ratio (per TP-201.5), as detailed below.

In systems where the A/L ratio can be altered without compromising a continuous performance test, such alteration is allowed provided the ARB Executive Officer's approval is obtained in advance. If the A/L is altered, it shall be necessary to generate an additional two weeks of acceptable pressure data prior to performing an acceptable efficiency test. It shall also be necessary to repeat the A/L test.

- (b) the vapor recovery system must either be compatible with established test methods, or be compatible with an alternative procedure, submitted to and approved by the ARB Executive Officer, from which the required information shall be obtained.
- (5) The duration of the operational test is usually ninety days. However, if that is determined by the ARB Executive Officer to be an inadequate period based on which to evaluate the system, design, or components, the test period shall be extended. Such determination can be made at any time.
- (6) Partial or complete failure of any component of the system, regardless of whether said component is manufactured by or under the direct control of the applicant, can be cause for termination and failure of the operational test if the component is determined by the ARB Executive Officer to be a necessary part of the system.
- (7) Seals which are broken for any reason, except with the explicit prior agreement of the ARB Executive Officer, are cause for termination and failure of the operational test (exceptions may be made when delay to obtain the ARB Executive Officer's concurrence would dangerously delay the correction of unsafe operating conditions caused by vandalism or other occurrences beyond the control of the applicant).
- (8) Problems which arise after a system has successfully completed an operational test, but while the system is still under evaluation pending certification, shall not be disregarded. (In other words, a failure on the 91st day shall not be ignored merely because it did not occur within the usual time period for operational tests.)
- (9) Any changes in the components of a system which are proposed after the system has completed an operational test are a basis for requiring another operational test of at least ninety days. While only one of the system components might differ from those of

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a system which has already passed an operational test, the entire system is subject to evaluation during the each test period. Failure of any component can be considered cause for failure of an entire system in a subsequent test regardless of the performance of that component in previous tests.

- (10) Prior to the conduct of a required certification efficiency test, the following requirements shall be met:
- (a) Successful completion of continuous performance tests, conducted on a system identical to that for which certification is requested, is required prior to efficiency testing for the purpose of certification. Efficiency testing shall not be conducted on systems or components which have not completed continuous performance tests of at least ninety days duration.
  - (b) From the start of the continuous performance tests to the end of the last required performance test, nothing shall be done to the system unless specifically called for in the required installation, operation, and maintenance manual, except as required by the ARB Executive Officer.
  - (c) Data for storage tank pressures, if required, shall be collected in accordance with the required test procedure. Data collection, if possible, shall take place concurrently with the operational test. Failure to provide the required minimum of two weeks of acceptable data (see static pressure performance standard, below), can be cause for extending the operational testing. Required certification efficiency testing shall be conducted only after pressure data has been submitted and deemed acceptable by the ARB Executive Officer.
- (11) Additional testing may be required as necessary to qualify and quantify the effects of defects which impair the effectiveness of the system, to verify operating parameters (such as the A/L), etc under operating conditions determined by the ARB Executive Officer as challenge and failure modes for the system.
- (12) The ARB Executive Officer shall determine the time for the beginning of challenge and failure mode testing and provide the results of such determination to the applicant. Any challenge or failure mode testing performed before such time can result in a requirement to start continuous performance testing anew.

4.1.2.2 Test Procedures

Test procedures shall be required for the performance standard for continuous operation based on evaluation by the ARB Executive Officer and a determination of necessity.

4.1.3 Static Pressure

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4.1.3.1 Performance Standard

Each vapor recovery system and its associated dispensing facility shall maintain static pressure integrity throughout the interior of all plumbing and vapor volume in the system. The static pressure performance shall be determined at test conditions during the certification process; but shall be specified as the performance standard for all installations of the system.

This standard shall be determined for at least two modes of facility operation:

(1) **Phase I Mode**

**Except as noted below**, the Phase I mode shall be tested with:

- (a) spill containment box covers *removed, with*
- (b) Phase I fill pipe caps **removed**, and with:
- (c) Phase I vapor return adapter caps **removed**.

**For spill containment boxes with cover-actuated drain valves**, an additional test shall be performed with:

- (a) spill containment box covers *installed, with*
- (b) Phase I fill pipe caps **removed**, and with:
- (c) Phase I vapor return adapter caps **removed**.

(2) **Phase II Mode**

**Except as noted below**, the Phase I mode shall be tested with:

- (a) spill containment box covers *installed, with*
- (b) Phase I fill pipe caps *removed*, and with:
- (c) Phase I vapor return adapter caps *installed*.

**For spill containment boxes with cover-actuated drain valves**, an additional test shall be performed with:

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- (a) spill containment box covers *removed*, with
- (b) Phase I fill pipe caps *removed*, and with:
- (c) Phase I vapor return line caps *installed*.

The following requirements are necessary to co-ordinate the Continuous Performance Test with the Static Pressure Performance Test:

- (3) The vapor recovery system shall demonstrate compliance with the static pressure performance standard before the beginning of any continuous performance test.

Any maintenance necessary to achieve compliance with the static pressure performance standard shall be documented and reported to the ARB Executive Officer.

After two weeks, the vapor recovery system shall again demonstrate compliance with the static pressure performance standard. No maintenance of any type may be performed at any time during the two week period.

- (4) The static pressure of the underground storage tanks shall be monitored and recorded throughout the continuous performance test. Prior approval from the ARB Executive Officer shall be obtained for the type of instrument to be used, chart speed, range, etc. A physical record of the storage tank pressures (e.g. a strip chart) shall be made and submitted at the end of the test period.

Acceptable data from at least two weeks pressure monitoring are required to demonstrate that the system is performing adequately with respect to storage tank pressure. Acceptable data is data which was collected in the period between two demonstrations of compliance with the static pressure performance standard, without maintenance.

- (5) A demonstration of compliance with the static pressure performance standard is required:
  - (a) at most seven days before and
  - (b) at least three days before the required certification efficiency test is started.
- (6) Any test equipment which is:
  - (a) necessary to perform the required certification efficiency test and

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(b) connected to the vapor space of the facility or the vapor recovery system

shall remain connected to the vapor recovery system for the duration of the efficiency test as it constitutes part of the system tested.

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- (7) The Phase I vapor recovery system shall be operated so as to minimize the loss of vapors from the facility storage tank, which may be under pressure, by adherence to the following practices. Provided that such practices are not in conflict with established safety procedures, they shall be conducted as follows:
- (a) The Phase I vapor return hose shall be connected to the cargo tank and to the vapor return coupler before the coupler is connected to the facility storage tank plumbing.
  - (b) The cargo tank vapor valve shall be opened only after all vapor connections have been made, and shall be closed before disconnection of any vapor hoses.
  - (c) The vapor hose shall be disconnected from the storage tank before it is disconnected from the cargo tank.
- (8) A demonstration of compliance with the static pressure performance standard is required at the earliest practical opportunity after the required certification efficiency test is ended.

**Warning:** The results of the efficiency test shall be unacceptable if maintenance is conducted or test equipment is removed in the time between the end of the required certification efficiency test and the start of this demonstration.

4.1.3.2 Determination of Compliance

The static pressure performance standard is dependent upon several factors including ullage in the dispensing facility tanks and the number of associated nozzles. The performance standard for any specific combination of these factors is determined by application of the required test procedure.

The requirement for static pressure performance allows a finite pressure decay. Although § 8 of TP-201.3 provides for diagnosis and remediation of leaks after the initial application of TP-201.3 § 8 (1)-(3) in each operating mode:

- (1) a determination of **compliance** is required if the criteria set forth in Tables 1 and 2 of TP-201.3 are **met** upon the initial application of TP-201.3 § 8 (1)-(3) in each operating mode.

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- (2) a determination of **non-compliance** is required if the criteria set forth in Tables 1 and 2 of TP-201.3 are **not met** upon the initial application of TP-201.3 § 8 (1)-(3) in each operating mode.

4.1.3.3 Determination of Volumetric Leak Flow Rate

Application of standard engineering principles can yield the corresponding volumetric leak flow rate; such a determination is not a requirement of this procedure, but equations are provided in § 11 of TP-201.3 to facilitate volumetric leak flow rate estimates, as desired.

4.1.3.4 Test Procedures

Compliance with the performance standard for static pressure shall be determined per:

**TP-201.3** (for new installations of systems certified by this procedure)

**TP-201.3A** (for existing installations of systems certified by earlier versions of this procedure)

**TP-201.3B** (for aboveground storage tanks)

4.1.4 Spillage

4.1.4.1 Performance Standard

Vapor recovery systems at dispensing facilities shall control spillage of liquid so that no more than 0.42 pounds are spilled per 1000 gallons of liquid dispensed.

- (1) No more than thirty instances of spillage per 100 vehicle fuelings shall occur during testing in accordance with TP-201.2C. See definitions in D-200 for further details.
- (2) In addition, the ARB Executive Officer shall certify only those systems which he or she determines:
- (i) will not increase the quantity of liquid lost through spillage over that quantity typical of non-vapor recovery systems,
  - (ii) can be expected to perform with such durability and reliability that excessive spillage will not be caused by failure of critical system components, and
  - (iii) incorporate provisions to prevent a buildup, during fueling of the vehicle, of pressure in the vehicle fuel tank sufficient to cause forceful ejection of gasoline. This determination shall be based on data obtained during the testing in accordance with TP-201.2C, failure mode testing, evaluation of reliability and

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durability of the system, and such other performance testing as the ARB Executive Officer deems necessary.

4.1.4.2 Test Procedures

Compliance with the performance standard for spillage shall be determined per:

**TP-201.2C**

4.2 Performance Specifications and Test Procedures

Performance specifications may be specified by the applicant in the required application information for each component or configuration of components of the vapor recovery system. Such performance specifications shall be the basis for any testing performed on any component or configuration of components when isolated from the rest of the system.

The specifications for each vapor recovery system configuration and its operating conditions shall explicitly include a performance specification for each of the following, as it relates to system design:

- (1) performance within dynamic pressure limits
- (2) performance of incinerators;
- (3) performance of vapor vent valves;
- (4) performance of vapor return valves;
- (5) performance of vapor pumps relative to liquid pumps (air to liquid volume ratio); and
- (6) performance of liquid removal devices in the vapor return line.

Other performance specifications shall be added, as appropriate after review of system information by the ARB Executive Officer.

4.2.1 Dynamic Pressure

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4.2.1.1 Performance Specification

Each vapor recovery system shall operate within dynamic pressure limits, subject to determination by the ARB Executive Officer.

The limits shall be based upon tests of the performance of the system during the certification process.

The dynamic pressure performance shall be determined at test conditions during the certification process; but shall be specified as the performance specification for all installations of the system.

Compliance with the dynamic pressure performance specification shall be determined

- (1) at least 72 hours before and
- (2) at the earliest practical opportunity after

the period of testing for the efficiency performance standard.

To avoid the specification of a performance specification which can not reasonably be met by all anticipated installations of an applicant's system, the applicant may specify that a fixed restriction be placed in the vapor return line during such dynamic pressure performance testing.

(1) **Balance Systems**

The ARB Executive Officer shall subject all balance systems to an engineering evaluation to determine and specify any appropriate dynamic pressure performance specification and test procedure on a case by case basis.

Any limits specified for balance systems shall be at least as stringent as those in the table below.

<b>Nitrogen Flow Rate (cubic feet per hour)</b>	<b>Dynamic Pressure (inches of water column)</b>
40	0.16
60	0.35
80	0.62

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(2) **Novel Systems**

The ARB Executive Officer shall subject all novel systems to an engineering evaluation to determine and specify any appropriate dynamic pressure performance specification and test procedure on a case by case basis.

(3) **Assist Systems**

The ARB Executive Officer shall subject all assist systems to an engineering evaluation to determine and specify any appropriate dynamic pressure performance specification and test procedure on a case by case basis.

4.2.1.2 Test Procedures

Compliance with the performance specification for dynamic pressure shall be determined per:

**TP-201.4**

4.2.2 Incinerators

4.2.2.1 Performance Specification

Any vapor recovery system which, as part of its design and intended function, incinerates vapors shall comply with:

- (1) a performance specification for carbon monoxide (CO) 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 per § 3:

- (1) the identification of such critical system operating parameters,
- (2) the performance specifications for such critical system operating parameters, and
- (3) the specification of requirements for indicating gauges, detection devices, and alarms.

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

- (1) storage tank ullage at start of liquid transfer
- (2) volume and volumetric rate of liquid transfer
- (3) number of nozzles in simultaneous use and
- (4) individual nozzle dispensing rates.

4.2.2.2 Test Procedures

Establishment of and compliance with the performance specifications for incinerators shall be determined per:

**TP-201.1A**

**TP-201.2**

4.2.3 Vapor Vent Valves

4.2.3.1 Performance Specification

Every vapor recovery system shall use a vapor vent valve in every vapor vent path to the atmosphere; an exception shall be provided for cases in which it has been demonstrated to the satisfaction of the ARB Executive Officer that vapor recovery performance is better without a vapor vent valve.

The flow versus pressure specifications provided below establish specifications of minimum stringency. The ARB Executive Officer can require more stringent specifications as technology improves.

Vapor vent valves shall each be successfully tested at least once.

Each vapor vent valve shall be:

- (1) incorporated into the design and function of each system to control release of vapor to the atmosphere and ingestion of air into the vapor space volume;

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- (2) tested by the valve manufacturer per TP-201.2B with a performance specification for flow versus positive gauge pressure of:

0.38 CFH @ +2.00 "WC;

- (3) tested by the valve manufacturer per TP-201.2B with a performance specification for flow versus negative gauge pressure of:

0.5 CFH @ -4.00 "WC;

- (4) tested by the valve manufacturer per TP-201.2B with a performance specification for transition flow (defined in D-200) versus positive gauge pressure of:

[transition flow @ +3.00 ± 0.50 "WC]; and

- (5) tested by the valve manufacturer per TP-201.2B with a performance specification for transition flow (defined in D-200) versus negative gauge pressure of:

[transition flow @ -8.00 ± 2.00 "WC].

4.2.3.2 Test Procedures

Compliance with the performance specifications for vapor vent valves shall be determined per:

**TP-201.2B**

4.2.4 Vapor Return Valves

4.2.4.1 Performance Specification

Every vapor recovery system shall use a vapor return valve in every vapor return path to the storage tank to control release of vapors to the atmosphere and ingestion of air into the vapor space volume during "idle nozzle" periods; an exception shall be provided for cases in which it has been demonstrated to the satisfaction of the ARB Executive Officer that vapor recovery performance is better without a vapor return valve.

In no case shall any vapor return path have more than one check valve whose closing force is only due to mechanical force (spring-type force) rather than, for example, electromagnetic force (solenoid-type force).

The flow versus pressure specifications provided below establish specifications of minimum stringency. The ARB Executive Officer can require more stringent specifications as

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technology improves.

At a minimum, vapor return valves shall each be successfully tested once by the valve manufacturer.

Each vapor return valve shall be:

(1) incorporated into the design and function of each dispensing nozzle, unless the volume between a vapor return valve location remote from the nozzle and the tip of the nozzle is less than 0.02 cubic feet and

(2) tested by the valve manufacturer per TP-201.2B with a performance specification for flow versus positive gauge pressure of:

0.038 CFH @ +2.00 "WC;

(3) tested by the valve manufacturer per TP-201.2B with a performance specification for flow versus negative gauge pressure of:

0.005 CFH @ -27.69 "WC (-1.00 psi).

Item (3) shall not be required for balance system vapor return valves.

4.2.4.2 Test Procedures

Compliance with the performance specifications for vapor return valves shall be determined per:

**TP-201.2B**

4.2.5 Air to Liquid Volume Ratio

4.2.5.1 Performance Specification

The air to liquid volume ratio is the quotient of (the volume of air collected by a system) divided by (the volume of liquid dispensed by a system). Each vapor recovery system shall operate within air to liquid volume ratio limits, subject to determination by the ARB Executive Officer.

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Assume that the nozzles in certification testing are representative of nozzles which will be used in subsequent installations of the system; require the applicant to submit flow versus pressure performance data for the nozzles in certification testing. Perform an engineering evaluation of the nozzles in certification testing to determine the acceptability of the applicant's data. The flow versus pressure qualities of each nozzle can be determined using TP-201.2B. Determine an acceptable range of flow versus pressure values and include such range as a performance specification in the ARB Executive Order so that subsequent installations of the system can be consistently tested.

Testing is performed to determine the air to liquid volume ratio (A/L) rather than the volume ratio of vapor (mixed with air) to liquid (V/L), because doing so is much more precise and less expensive. A/L testing can be coordinated with efficiency testing to yield A/L performance specifications for compliance testing.

The limits shall be based upon tests of the performance of the system during the certification process.

The air to liquid volume ratio performance shall be determined at test conditions during the certification process; but shall be specified as the performance specification for all installations of the system.

To avoid the specification of a performance specification which can not reasonably be met by all anticipated installations of an applicant's system, the applicant may specify that a fixed restriction be placed in the vapor return line (which shall actually contain air flow during testing) during such A/L performance testing.

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

- (1) number of nozzles in simultaneous use and
- (2) individual nozzle dispensing rates.

4.2.5.2 Test Procedures

Compliance with the performance specification for air to liquid volume ratio shall be determined per:

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**TP-201.5**

4.2.6 Liquid Removal Devices

4.2.6.1 Performance Specification

Each vapor recovery system subject to a performance specification for liquid removal devices shall remove at least 10 milliliters (mL) per gallon of liquid dispensed at dispensing rates exceeding five gallons per minute.

The worst-case dispenser-hose-nozzle plumbing configuration specified for a given system shall be used in the test conditions for this performance specification. All such specified plumbing configurations shall be tested.

The dispensing pump connected to any vapor recovery system shall be capable of dispensing liquid at a rate of at least five gallons per minute through all downstream dispensing components in one dispensing path when such components are at their highest flow settings and only one dispensing path is operating.

4.2.6.2 Test Procedures

Compliance with the performance specification for liquid removal devices shall be determined per:

**TP-201.6**

4.3 Performance Standards and Performance Specifications for Novel Systems

For novel systems, on a case-by-case basis, additional performance standards and performance specifications shall be required based on evaluation by the ARB Executive Officer and a determination of necessity.

4.4 Test Procedures for Novel Systems

Novel test procedures shall be required for novel systems based on evaluation by the ARB Executive Officer and a determination of necessity.

4.4.1 Technical Identification of Need

The equipment related to any application for certification shall be subject to an engineering evaluation.

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The engineering evaluation may result in a technical identification of need for development of special test procedures for novel systems, components, or applications.

4.4.2 Administrative Requirement for Development

Following any such technical identification of need, the applicant shall be responsible for developing test procedures for the applicant's equipment to demonstrate that such equipment can meet any applicable performance standards or specifications.

4.4.3 Evaluation and Approval

Any test procedures identified and developed by the applicant shall be subject to an engineering evaluation which must result in approval by the ARB Executive Officer to meet the requirements of this section.

**5 EVALUATION AND TESTING OF VAPOR RECOVERY EQUIPMENT**

5.1 General Evaluation and Testing

Vapor recovery systems shall be subjected to evaluation and testing according to the specified performance standards, performance specifications, and test procedures at the applicant's expense.

**Note:** To avoid the certification of a performance standard or performance specification which can not reasonably be met by all anticipated installations of a certified system, the applicant may specify (a) challenge mode(s) for system testing, subject to approval by the ARB Executive Officer. The ARB Executive Officer shall evaluate each system to determine the need for failure mode testing; and if such need is positively determined the ARB Executive Officer shall specify (a) failure mode(s) for system testing.

"Challenge mode testing" is testing conducted with a system installation intentionally modified so that the performance standard is more difficult to meet. The purpose of challenge mode testing is to provide a basis for determining performance specifications which reasonably can be met by all anticipated installations of a certified system.

"Failure mode testing" is testing conducted with a system installation intentionally modified so that it fails to meet its performance standard. The purpose of failure mode testing is to provide a basis for determining performance specifications which, when met, provide reasonable assurance that an installation of the system is not in the related failure mode.

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- (1) The ARB Executive Officer shall conduct all evaluation and testing unless the ARB Executive Officer determines that the equipment owner or operator shall contract for or conduct specified evaluation and testing on a case-by-case basis.
- (2) All test personnel, regardless of their primary employer, shall be responsible solely to the ARB Executive Officer for the conduct of all testing activities required by this certification procedure. Such testing activities include, but are not limited to:
  - (a) collection of data
  - (b) calculation of results
  - (c) reporting of results
- (3) The ARB Executive Officer shall be present to monitor all testing and clarify the application of the procedures in novel circumstances; test data, calculations, and reported results shall be subsequently reviewed and evaluated by the ARB Executive Officer to determine their validity for inclusion in the Certification Report.

5.2 Alternative Evaluation and Testing

Certification 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 certification procedure, the applicant is responsible for demonstrating to the ARB Executive Officer's satisfaction that the alternative certification procedure is equivalent to this certification 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.

5.3 Preliminary Evaluation

A preliminary engineering evaluation shall be performed on each subject vapor recovery system to determine the conditions under which field testing, bench testing, and further engineering evaluation shall be performed.

Field testing, bench testing and engineering evaluation of subject vapor recovery systems and

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components shall be conducted in a manner, determined by the ARB Executive Officer, which shows consideration of the difficulties of actual in-use circumstances in which the systems and components are expected to be employed:

- (1) According to the rationale given the note box in § 5.1, the ARB Executive Officer shall determine any challenge and failure modes necessary to reflect the matrix of actual in-use circumstances expected for all installations of such systems. If such modes are determined, they shall be specified in writing to the applicant.
- (2) Field testing, bench testing and engineering evaluation shall include any challenge and failure modes for such systems as determined in (1) to provide for performance standards and performance specifications which can be met by the actual use of all installations of such systems.

5.4 Compliance Conditions for Facility and System

This procedure requires specification of conditions of installation, operation, and maintenance for a subject facility. See § 3.

During certification testing, any conditions of installation, operation, and maintenance which deviate from such specifications, shall be recorded and included as amendments to the specifications of certification. Subsequent to such certification, any conditions which occur outside such specifications (for any facility installed, operating, and maintained on the basis of such certification) shall constitute a violation of the specifications of certification.

5.5 Field Testing

The ARB Executive Officer shall require field testing for any performance standard or performance specification if, after its evaluation, field testing is the only acceptable alternative.

5.6 Bench Testing

The ARB Executive Officer shall require bench testing for any performance standard or performance specification if, after its evaluation, bench testing is necessary and a non-testing evaluation alternative is inadequate.

5.7 Evaluation

The ARB Executive Officer shall evaluate the results of testing for any performance standard or performance specification.

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The ARB Executive Officer shall conduct a non-testing evaluation, after determining that testing is unnecessary, for any performance standard or performance specification.

**6 DOCUMENTATION FOR CERTIFICATION**

A Certification Report shall be prepared, at the applicant's expense, documenting the preceding components:

- (1) Application for Certification
- (2) Standards, Specifications, and Test Procedures
- (3) Evaluation and Testing of the Vapor Recovery System

**Note:** In addition to other required results, vapor recovery system test results shall be reported in units of pounds of hydrocarbon emitted per thousand gallons of fuel transferred for any results which are expressible in such units.

The ARB Executive Officer shall consult with the applicant, shall review the report, may require revisions or more work on the components, and shall approve and sign the Certification Report after it is determined that:

- (1) The Certification Report is complete.
- (2) The Certification Report documents successful performance of the subject vapor recovery system according to the performance standards, performance specifications, and test procedures.

**7 CERTIFICATION**

The ARB Executive Officer shall not certify any system until after the system's Certification Report is approved and signed.

Evidence of certification shall be an ARB Executive Order (which shall reference the Certification Report) signed by the ARB Executive Officer.

After approval and signature of the ARB Executive Order, Certification Reports shall be maintained in the ARB Executive Officer's files and shall be made available upon request.

When a system is certified, it will have certain physical features such as piping sizes and configurations which may have to be modified to accommodate the requirements of each installation. Because the

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pressure drops and other characteristics of the system are influenced by these features and these in turn influence effectiveness, it may be necessary to condition acceptance upon certain criteria which account for physical parameters such as pressure drops and flow rates. When systems are tested for certification, these parameters will be ascertained.

Some of the conditions that may be imposed upon certification are:

- (1) Allowable pressure drop in the lines leading from the dispensing nozzle to the underground tank.
- (2) The method of calculating the pressure drop.
- (3) The model of dispensing nozzle which may be used.
- (4) The manner in which vapor return lines may be manifolded.
- (5) The type of restriction to be placed on the vent of the underground tank.
- (6) The number of dispensing nozzles which may be serviced by a secondary system.
- (7) Allowable delivery rates.
- (8) Use of the system on full-service stations only.
- (9) Inclusion of indicating gauges, detection devices, or alarms.
- (10) Performance specifications, including emission factors.

The ARB Executive Officer shall certify only a system which, on the basis of an engineering evaluation of such system's component qualities, design, and test performance, can be expected to comply with such system's certification conditions over the one-year warranty period specified above.