State of California
AIR RESOURCES BOARD

Executive Order VR-102-E
OPW Phase I Vapor Recovery System

WHEREAS, the California Air Resources Board (ARB) has established, pursuant to California Health and Safety Code sections 39600, 39601 and 41954, certification procedures for systems designed for the control of gasoline vapor emissions during the filling of underground gasoline storage tanks, in its **CP-201, *Certification Procedure for Vapor Recovery Systems at Gasoline Dispensing Facilities*** (Certification Procedure), as last amended October 8, 2003, incorporated by reference in Title 17, California Code of Regulations, section 94011;

WHEREAS, ARB has established, pursuant to California Health and Safety Code sections 39600, 39601 and 41954, test procedures for determining the compliance of Phase I vapor recovery systems with emission standards;

WHEREAS, OPW Fueling Components, Inc. (OPW) requested and was granted certification of the OPW Phase I Vapor Recovery System (OPW system) pursuant to the Certification Procedure by Executive Order VR-102-A, first issued on September 26, 2002, and reissued on October 10, 2002;

WHEREAS, OPW requested a further modification to the certification to include additional components of the OPW system;

WHEREAS, the requested modifications to the certification of the OPW system have been tested and evaluated pursuant to the Certification Procedure;

WHEREAS, the Certification Procedure provides that the ARB Executive Officer shall issue an Executive Order if he or she determines that the vapor recovery system, including modifications, conforms to all of the applicable requirements set forth in the Certification Procedure;

WHEREAS, G-01-032 delegates to the Chief of the Monitoring and Laboratory Division the authority to certify or approve modifications to certified Phase I and Phase II vapor recovery systems for gasoline dispensing facilities (GDF); and

WHEREAS, I, William V. Loscutoff, Chief of the Monitoring and Laboratory Division, find that the OPW Phase I Vapor Recovery System, including modifications, conforms with all of the requirements set forth in the Certification Procedure, and results in a vapor recovery system which is at least 98.0 percent efficient as tested in accordance with test procedure **TP-201.1**, ***Volumetric Efficiency for Phase I Systems***;

NOW THEREFORE, IT IS HEREBY ORDERED that the OPW system is certified to be at least 98.0 percent efficient when installed and maintained as specified herein and in the following exhibits. Exhibit 1 contains a list of the certified components. Exhibit 2

contains the performance standards and specifications, typical installation drawings, and maintenance intervals for the OPW system as installed in a gasoline dispensing facility (GDF). Exhibit 3 contains the manufacturing specifications.

IT IS FURTHER ORDERED that compliance with the applicable certification requirements, rules, and regulations of the Division of Measurement Standards of the Department of Food and Agriculture, the Office of the State Fire Marshal of the Department of Forestry and Fire Protection, and the Division of Occupational Safety and Health of the Department of Industrial Relations are made conditions of this certification.

IT IS FURTHER ORDERED that OPW shall provide a warranty for the vapor recovery system and components to the initial purchaser and each subsequent purchaser within the warranty period. The manufacturer of components not manufactured by OPW shall provide a warranty for each of their components certified herein. This warranty shall include the ongoing compliance with all applicable performance standards and specifications, and shall comply with all warranty requirements in Section 9.2 of the Certification Procedure. OPW may specify that the warranty is contingent upon the use of trained installers. Copies of the warranty for the system and components shall be made available to the GDF owner or operator.

IT IS FURTHER ORDERED that the certified OPW system shall be installed, operated, and maintained in accordance with the ***ARB-Approved Installation, Operation and Maintenance Manual for the OPW Phase I Vapor Recovery System.*** A copy of this Executive Order and manual shall be maintained at each GDF where a certified OPW system is installed.

IT IS FURTHER ORDERED that equipment listed in Exhibit 1, unless exempted, shall be clearly identified by a permanent identification showing the manufacturer's name and model number.

IT IS FURTHER ORDERED that any alteration in the equipment, parts, design, installation, or operation of the system certified hereby is prohibited and deemed inconsistent with this certification unless the alteration has been submitted in writing and approved in writing by the Executive Officer or Executive Officer's delegate.

IT IS FURTHER ORDERED that the following requirements be made a condition of certification. The owner or operator of the OPW system shall conduct and pass the following tests no later than 60 days after startup and at least once every three (3) years after startup testing, using the latest adopted version of the following test procedures: **TP-201.3,** ***Determination of 2 Inch WC Static Pressure Performance of Vapor Recovery Systems of Dispensing Facilities***, **TP-201.1B***, Static Torque of Rotatable Phase I Adaptors* and depending on the system configuration, either **TP-201-1D***, Leak Rate of Drop Tube Overfill Prevention Devices and Spill Container Drain Valves*; or **TP-201.1C,** ***Leak Rate of Drop Tube/Drain Valve Assembly***. Shorter time periods may be specified in accordance with local district requirements. Notification of testing and submittal of test results shall be done in accordance with local district requirements and pursuant to the policies established by that district. Alternative test procedures may be used if determined in writing by the Executive Officer to yield comparable results.

Testing the P/V valve will be at the option of the local districts. If P/V valve testing is required by the district, the test shall be conducted in accordance with **TP-201.1E, *Leak Rate and Cracking Pressure of Pressure/Vacuum Vent Valves***.

IT IS FURTHER ORDERED that the OPW system shall be compatible with fuels in common use in California at the time of certification and any modifications to comply with future California fuel requirements shall be approved in writing by the Executive Officer or Executive Officer's delegate.

IT IS FURTHER ORDERED that the certification of the OPW Phase I vapor recovery system is valid through September 30, 2006.

IT IS FURTHER ORDERED that Executive Order VR-102-D, issued on April 27, 2004 is hereby superceded by this Executive Order.

Executed at Sacramento, California, this 15th day of October 2004

William V. Loscutoff, Chief
Monitoring and Laboratory Division

Attachments:

Exhibit 1 OPW Phase I Vapor Recovery System Equipment List
Exhibit 2 Installation, Maintenance and Compliance Specifications
Exhibit 3 Manufacturing Performance Standards and Specifications

Executive Order VR-102-E OPW Phase I Vapor Recovery System

Exhibit 1
OPW Phase I Vapor Recovery System Equipment List

Equipment	**Manufacturer/Model Number**
Pressure/Vacuum Vent Valve	Husky Model 4885, 2-Inch Threaded OPW 623V, 2 and 3-inch Threaded
Spill Containers and Covers	OPW TTT-21WWWX-YZZZ TTT indicates spill bucket material/cover type: (not required with sump configuration lid) 1 = Aluminum 1C = Cast iron 1SC = Sealable aluminum cover with an expandable seal. WWW Indicates bucket size: 00 = 5-gallon 15 = 15-gallon 00E = 7.5-gallon (deep bucket model) X indicates bucket base type C = Cast Iron No letter indicates composite base Y indicates drain valve or plug ZZZ indicates special configuration EVR = Standard SH = Self supporting container without ring and cover Pomeco 5XX XX indicates spill bucket material/cover type: 11= Composite base, bolt down cover 21= Composite base, roto-lock cover 61= Cast iron base, bolt down cover 71= Cast iron base, roto-lock cover
Sump Configuration Lid [1]	Fibrelite FL-36 inch
Replacement Drain Valve Kit	OPW 1DK-2100
Dust Caps	OPW 634TT-EVR (product) OPW 1711T-EVR (vapor) OPW 634LPC (product) OPW 1711LPC (vapor)

Product Adaptor	OPW 61SALP-EVR
Vapor Adaptor	OPW 61VSA-EVR
Extractor Assembly [1]	OPW 233
Ball Float Vent Valve [1, 2]	OPW 53VML OPW 30MV
Jack Screw Kit	OPW 61JSK-4400-EVR OPW 61JSK-4410 OPW 61JSK-44CB
Face Seal Adaptor	OPW FSA-400 OPW FSA-400-S
Drop Tube	OPW 61T (various lengths)
Drop Tube Overfill Prevention Device [1]	OPW 61SO-XXXC-EVR Where XXX = 400, 410, 412, 420 or 440
Double Fill	OPW (Configuration Only)
Tank Bottom Protector [1]	OPW/Pomeco 6111-1400-EVR
Tank Gauge Port Components [1]	Morrison Brothers 305XPA1100AKEVR (cap & adaptor kit) Morrison Brothers 305-0200AAEVR (replacement adaptor) Morrison Brothers 305XP-110ACEVR (replacement cap) Ever-Tite 4097AGBR Adaptor Ever-Tite 4097AGMBRNL Adaptor Ever-Tite 4097MBR Cap Veeder-Root 312020-952 (cap & adaptor)

[1] Component optional for vapor recovery; may be required by other applicable regulations.
[2] The 53VML and 30MV includes both the 2" and 3" models

Table 1
Components Exempt from Identification Requirements

Component Name	Manufacturer	Model Number
Replacement Drain Valve	OPW	1DK-2100
Jack Screw	OPW	61JSK-4400-EVR 61JSK-4410 61JSK-44CB
Tank Gauge Port Component (Cap and Adaptor)	Morrison Brothers	305XPA1100AKEVR (cap & adaptor kit), 305-0200AAEVR (replacement adaptor, and 305XP-110ACEVR (replacement cap).
Drop Tube	OPW	61-T, 61SO
Face Seal Adaptor	OPW	OPW FSA-400 OPWFSA-400-S

Executive Order VR-102-D OPW Phase I Vapor Recovery System

Exhibit 2
Installation, Maintenance and Compliance Standards and Specifications

This exhibit contains the installation, maintenance and compliance standards, and specifications applicable to an OPW system installed in a gasoline dispensing facility (GDF).

General Specifications

1. Typical installations of the OPW system are shown in Figures 2A and 2B.

2. The OPW system shall be installed, operated, and maintained in accordance with the ***ARB-Approved Installation, Operation and Maintenance Manual for the OPW Phase I Vapor Recovery System***.

3. Any repair or replacement of system components shall be done in accordance with the ***ARB-Approved Installation, Operation and Maintenance Manual for the OPW Phase I Vapor Recovery System.***

4. The OPW system shall comply with the applicable performance standards and performance specifications in CP-201. Compliance of the system and all components shall be demonstrated in accordance with **TP-201.3, *Determination of 2 Inch WC Static Pressure Performance of Vapor Recovery Systems of Dispensing Facilities***.

5. There shall be at least one vapor recovery connection, throughout all Phase I deliveries, between the cargo tank and the GDF storage tank into which fuel is being delivered to ensure that vapor is returned to the cargo tank from the underground storage tank system.

Pressure/Vacuum Vent Valves For Storage Tank Vent Pipes

1. No more than three certified pressure/vacuum vent valves (P/V valves) listed in Exhibit 1 shall be installed on any GDF underground storage tank system.

2. Compliance determination of the following P/V valve performance specifications shall be at the option of the districts:

    a. The leak rate of each P/V valve shall not exceed 0.05 cubic feet per hour (CFH) at 2.00 inches of H_2O positive pressure and 0.21 CFH at 4.00 inches negative pressure as determined by **TP-201.1E, *Leak Rate and Cracking Pressure of Pressure/Vacuum Vent Valves***.

b. The positive pressure setting is 3.0 $\pm$ 0.5 inches of H_2O and the negative pressure setting is -8.0 $\pm$ 2.0 inches of H_2O as determined by **TP-201.1E, *Leak Rate and Cracking Pressure of Pressure/Vacuum Vent Valves***.

3. A manifold may be installed on the vent pipes to reduce the number of potential leak sources and P/V valves installed. Vent pipe manifolds shall be constructed of steel pipe or an equivalent material that has been listed for use with gasoline. If a material other than steel is used, the GDF operator shall make available, information demonstrating that the material is compatible for use with gasoline. One example of a typical vent pipe manifold is shown in Figure 2D. This shows only one typical configuration; other manifold configurations may be used. For example, a tee may be located in a different position, or fewer pipes may be connected, or more than one P/V valve may be installed on the manifold.

4. The vent pipe manifold shall be installed at a height not less than 12 feet above the grade used for gasoline cargo tank delivery operations and shall conform to all applicable regulations.

5. Each P/V valve shall have permanently affixed to it a yellow or gold-colored label with black lettering stating the following specifications:

Positive pressure setting: 3.0 $\pm$ 0.5 inches H_2O
Negative pressure setting: -8.0 $\pm$ 2.0 inches H_2O
Positive Leakrate: 0.05 CFH at 2.0 inches H_2O
Negative Leakrate: 0.21 CFH at -4.0 inches H_2O

Rotatable Product and Vapor Recovery Adaptors

1. Rotatable product and vapor recovery adaptors shall be capable of at least 360-degree rotation and have an average static torque not to exceed 108 pound-inch (9 pound-foot). Compliance with this requirement shall be demonstrated in accordance with the latest adopted version of **TP-201.1B, *Static Torque of Rotatable Phase I Adaptors***.

2. The vapor adaptor poppet shall not leak when closed. Compliance with this requirement may be verified by the use of commercial liquid leak detection solution or by bagging, when the vapor containment space of the underground storage tank is subjected to a non-zero gauge pressure. (Note: leak detection solution will detect leaks only when positive gauge pressure exists.)

Vapor Recovery and Product Adaptor Dust Caps

Dust caps with intact gaskets shall be installed on all Phase I tank adaptors.

Spill Container Drain Valve

The spill container drain valve shall be configured to drain liquid directly into the drop tube and shall be isolated from the underground storage tank ullage space. The leak rate of the drain valve shall not exceed 0.17 CFH at 2.00 inches H_2O. Depending on the presence of the drop tube overfill prevention device, compliance with this requirement shall be demonstrated in accordance with the latest adopted version of either **TP-201.1D, *Leak Rate of Drop Tube Overfill Prevention Devices and Spill Container Drain Valves***; or **TP-201.1C*, Leak Rate of Drop Tube/Drain Valve Assembly***.

Drop Tube Overfill Prevention Device

1. The Drop Tube Overfill Prevention Device (overfill device) is designed to restrict the flow of gasoline delivered to the underground storage when liquid levels exceeds a specified capacity. The overfill device is not a required component of the vapor recovery system, but may be installed as an optional component. Other regulatory requirements may apply.

2. The leak rate of the overfill device shall not exceed 0.17 CFH at 2.00 inches H_2O when tested as in accordance with the latest adopted version of **TP-201.1D, *Leak Rate of Drop Tube Overfill Prevention Devices and Spill Container Drain Valves***.

Face Seal Adaptor

The Face Seal Adaptor shall provide a machined surface on which a gasket can seal and ensures that the seal is not compromised by an improperly cut or improperly finished riser. A Face Seal Adaptor shall be installed on the following required connections. As an option, the adaptor may be installed on other connections.

a. Product Spill Container (required)
b. Tank Gauging Components (required)
c. Vapor Recovery Spill Container (optional)
d. Rotatable Adaptors (optional)

Ball Float Vent Valve

A Ball Float Vent Valve (ball float) is designed to restrict the flow of a gasoline delivery by using back pressure when the storage tank levels exceed a specified level. If installed for overfill prevention, a ball float must be installed at each vapor and vent connection to the tank. Ball floats are not required components of the vapor recovery system, but may be installed as optional components for vapor recovery. Other requirements may apply.

Double Fill Configuration

1. OPW Double Fill Configuration shall be allowed for installation provided that no more than two fill and two vapor return points are installed on any single underground storage tank and that no offset of the vapor recovery riser pipe is installed. An example of a OPW Dual Fill configuration in shown in Figure 2C.

2. The OPW Double Fill Configuration can also be used in the single fill mode if applicable. However, if used in double fill configuration, two vapor return hoses shall be connected to the dual fill configuration with at least one connection to each cargo tank(s) used to simultaneously deliver gasoline through two product hoses into a single tank.

Vapor Recovery Riser Offset

1. The vapor recovery tank riser may be offset from the tank connection to the vapor recovery Spill Container provided that the maximum horizontal distance (offset distance) does not exceed 20 inches. One example of an offset is shown in Figure 2E.

2. The vapor recovery riser shall be offset up to 20 inches horizontal distance with use of commercially available, 4 inch diameter steel pipe fittings.

Tank Gauge Port Components

The tank gauge adaptor and cap are paired. Therefore, an adaptor manufactured by one company shall be used only with a cap manufactured by the same company.

Connections and Fittings

All connections and fittings not specifically certified with an allowable leak rate shall not leak. The absence of vapor leaks may be verified with the use of commercial liquid leak detection solution (LDS) or by bagging, when the vapor containment space of the underground storage tank is subjected to a non-zero gauge pressure. (Note: leak detection solution will detect leaks only when positive gauge pressure exists).

Maintenance Records

Each GDF operator/owner shall keep records of maintenance performed at the facility. Such record shall be maintained on site or in accordance with district requirements or policies. The records shall include the maintenance or test date, repair date to correct test failure, maintenance or test performed, affiliation, telephone number, and name of individual conducting maintenance or test. An example of a Phase I Maintenance Record is shown in Figure 2F.

Table 2-1
Gasoline Dispensing Facility Compliance Standards and Specifications

Component	Test Method	Standard or Specification
Rotatable Phase I Adaptors	TP-201.1B	Minimum, 360-degree rotation Maximum, 108 pound-inch average static torque
Overfill Prevention Device	TP-201.1D	≤0.17 CFH at 2.00 in. H_2O
Spill Container Drain Valve	TP-201.1C or TP-201.1D	≤0.17 CFH at 2.00 in. H_2O
P/V Valve[1.]	TP-201.1E	Positive pressure setting: 3.0 ± 0.5 in. H_2O Negative pressure setting: -8.0 ± 2.0 in. H_2O Positive Leakrate: 0.05 CFH at 2.0 in. H_2O Negative Leakrate: 0.21 CFH at -4.0 in. H_2O
Gasoline Dispensing Facility	TP-201.3	As specified in TP-201.3 and/or CP-201
Connections and fittings certified without an allowable leak rate	Leak Detection Solution or Bagging	No leaks

Table 2-2
Maintenance Intervals for System Components

Manufacturer	Component	Maintenance Interval
Husky	Pressure/Vacuum Vent Valve	Annual
Morrison Brothers	Tank Gauge Components	Annual
OPW	Pressure/Vacuum Vent Valve	Annual
OPW	Dust Caps (all models)	Annual
OPW	61-T Straight Drop Tube	Annual
OPW	Ball Float (all models)	Every 3 years
OPW	Rotatable Phase I Adaptors	Annual
OPW	Drop Tube Overfill Prevention Valve	Annual
OPW\Pomeco	Spill Containers (all models)	Annual

1. Compliance determination is at the option of the district.

Figure 2A

Typical Product Installation Using OPW System

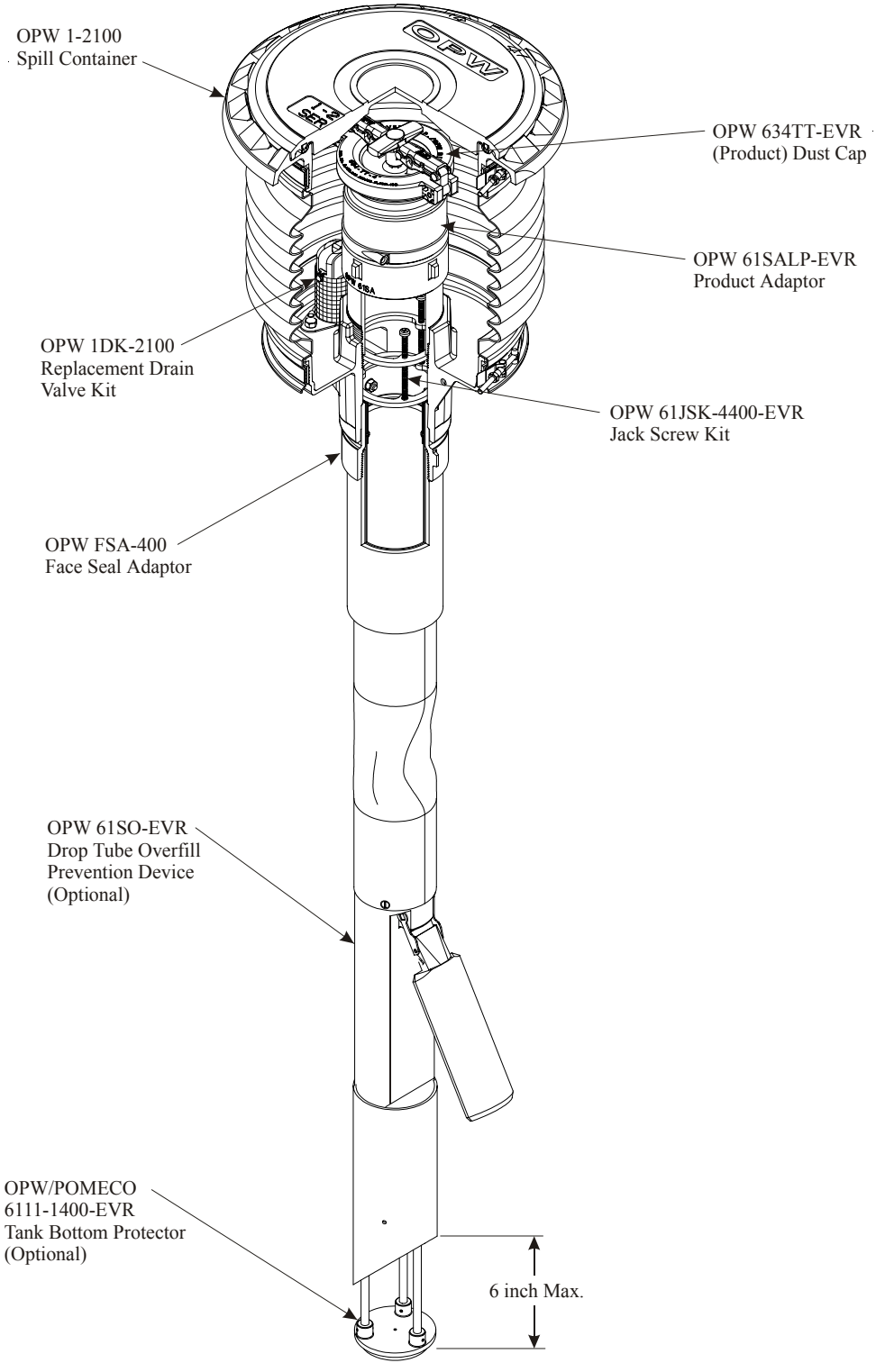


Figure 2B

Typical Vapor Installation Using OPW System

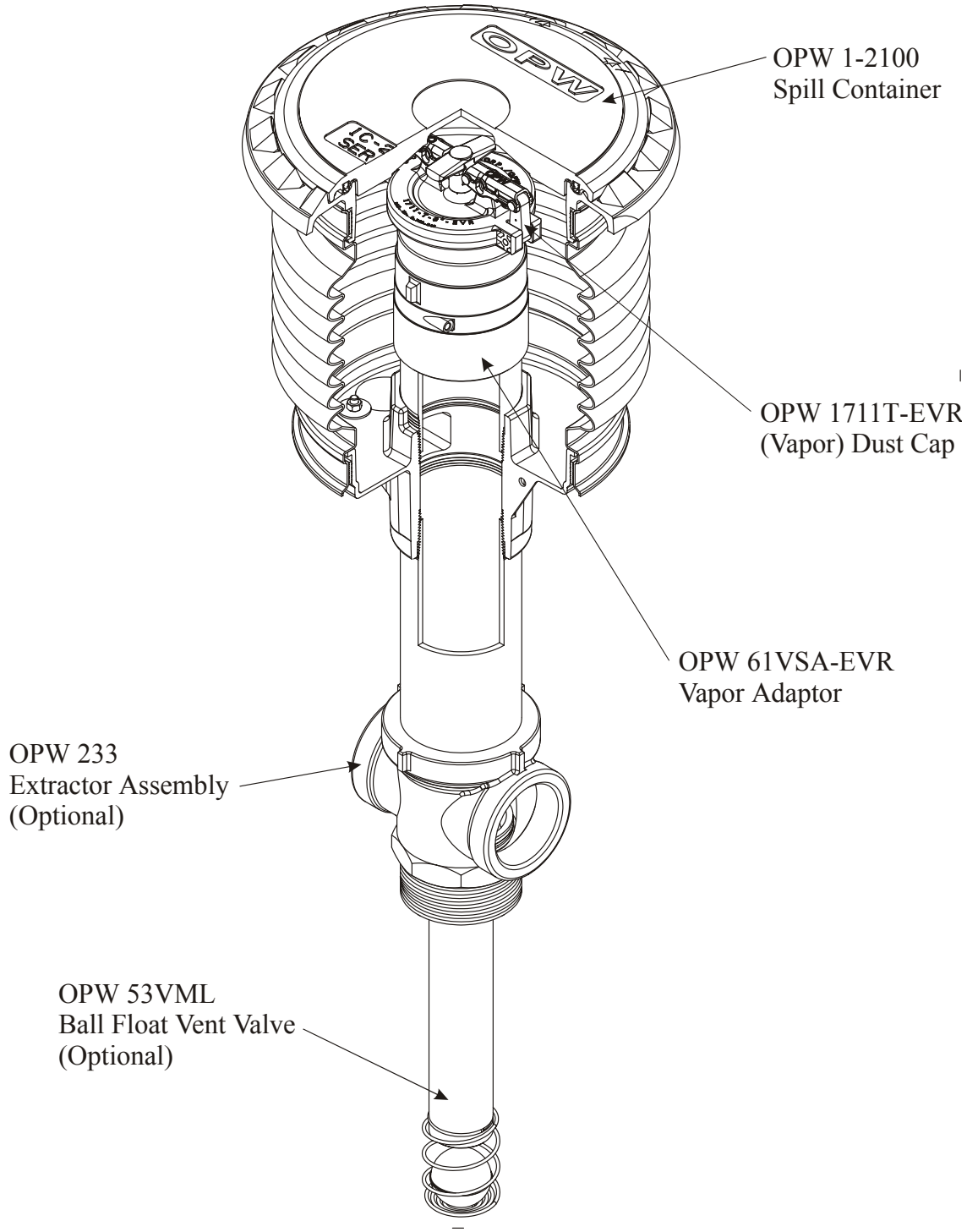


Figure 2C

Typical OPW/POMECO Double Fill Configuration

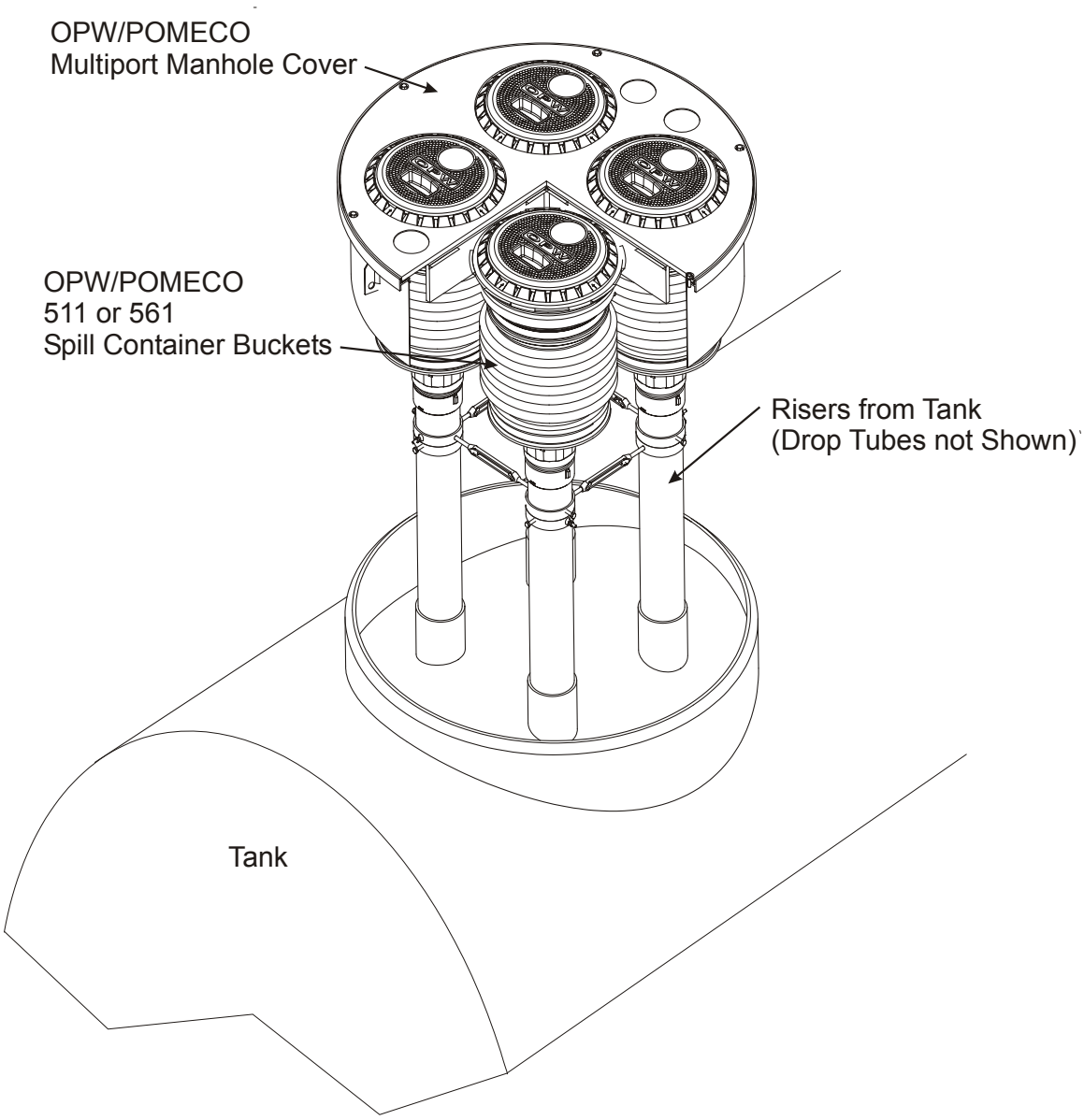
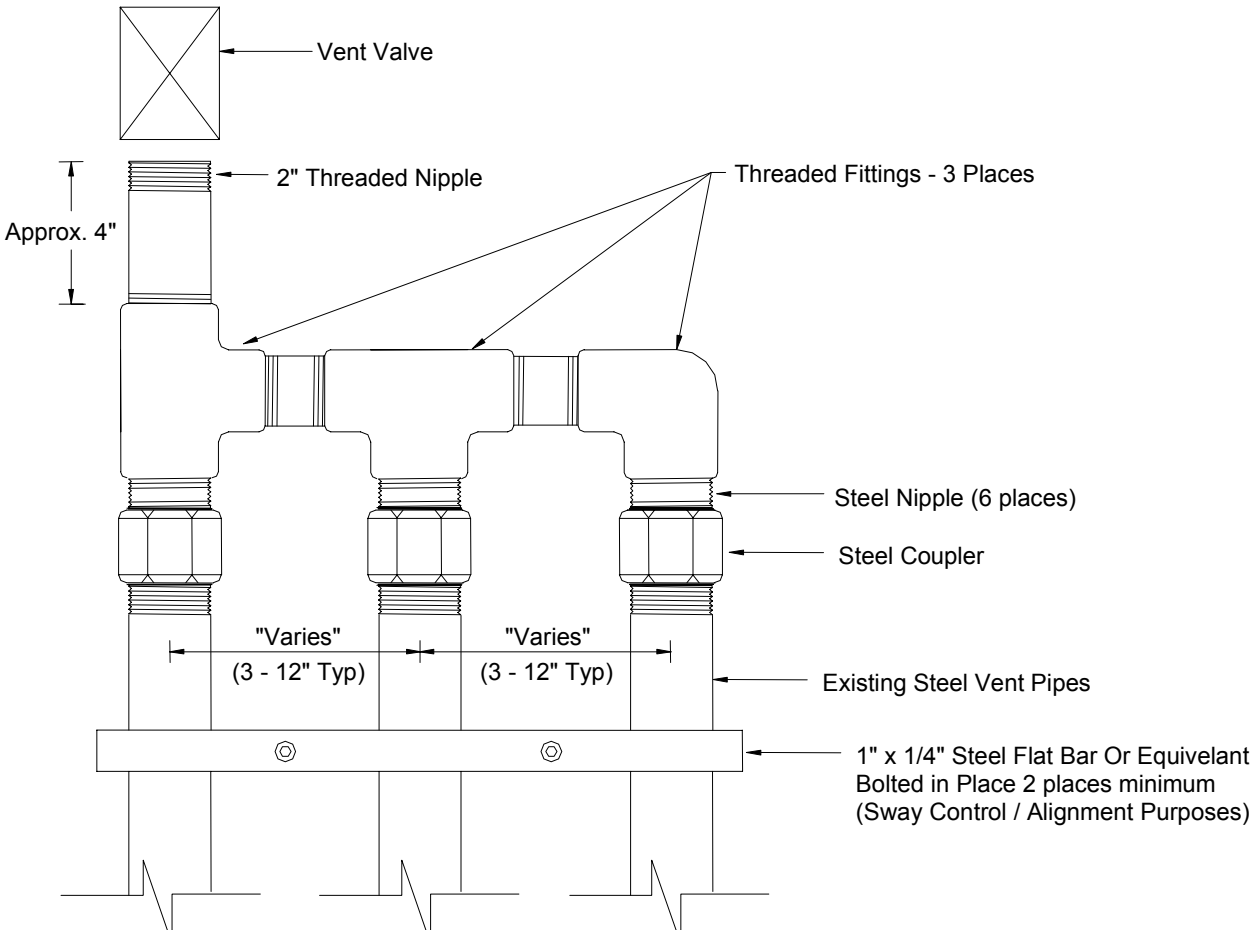


Figure 2D

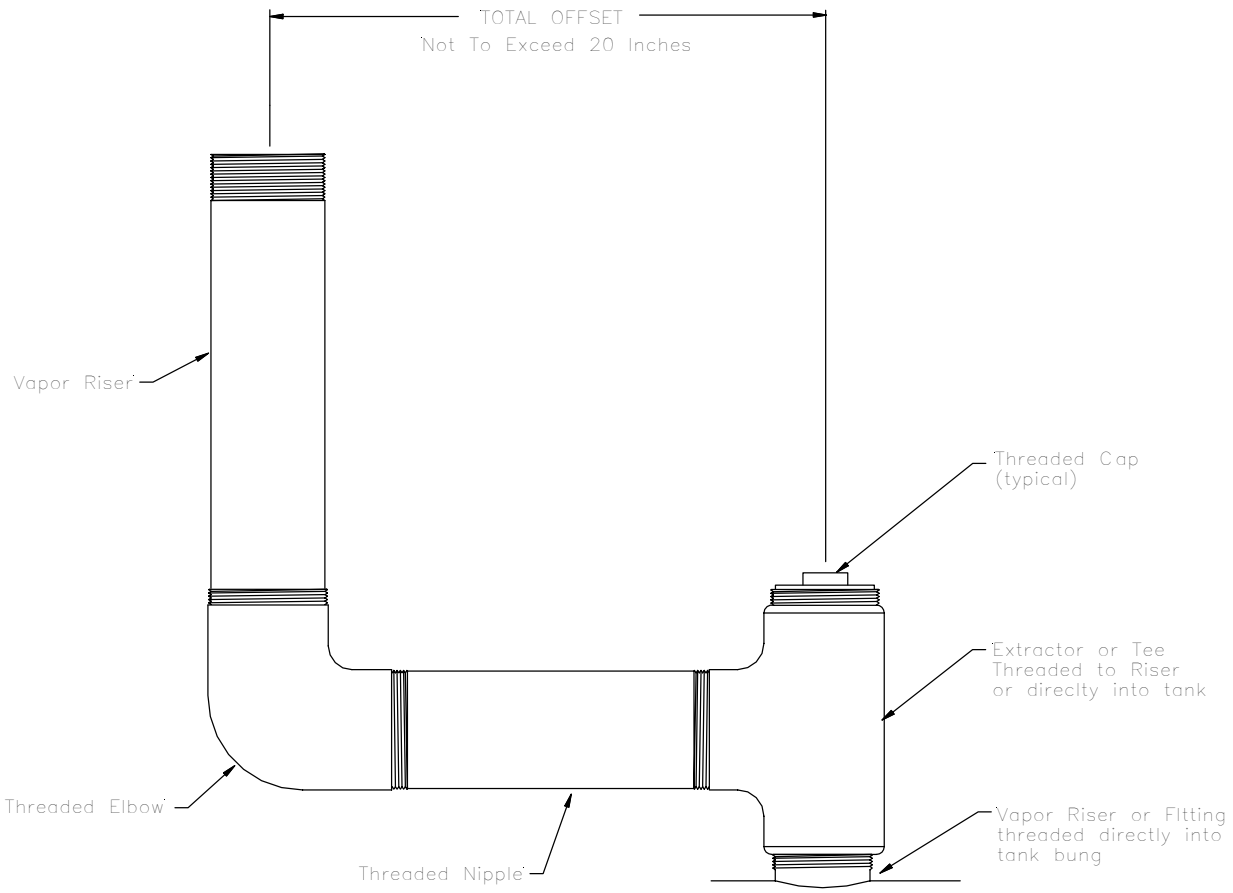
Typical Vent Pipe Manifold



Note: This shows only one typical configuration; other manifold configurations may be used. For example, a tee may be located in a different position, or fewer pipes may be connected, or more than one P/V valve may be installed on the manifold.

Figure 2E

Typical Vapor Recovery Riser Offset



Note: This figure represents one instance where a vapor recovery riser has been offset in order to construct a two-point Phase I vapor recovery system. The above figure illustrates an offset using a 90-degree elbow. However, in some instances, elbows less than 90 degrees may be used. All fittings and pipe nipples shall be 4-inch diameter similar to those of the spill container and rotatable Phase I adaptors in order to reduce back pressure during a gasoline delivery.

Figure 2F

Example of a GDF Phase I Maintenance Record

Date of Maintenance/ Test/Inspection/ Failure	Repair Date To Correct Test Failure	Maintenance/Test/Inspection Performed and Outcome	Affiliation	Name of Individual Conducting Maintenance or Test	Telephone Number

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Exhibit 3
Manufacturing Performance Standards and Specifications

The OPW system and all components shall be manufactured in compliance with the performance standards and specifications in CP-201, as well as the requirements specified in this Executive Order. All components shall be manufactured as certified; no change to the equipment, parts, design, materials, or manufacturing process shall be made unless approved in writing by the Executive Officer. Unless specified in Exhibit 2 or in the ***ARB-Approved Installation, Operation and Maintenance Manual for the OPW Phase I Vapor Recovery System***, the requirements of this section apply to the manufacturing process and are not appropriate for determining the compliance status of a GDF.

Pressure/Vacuum Vent Valves for Storage Tank Vent Pipes

1. Each pressure/vacuum vent valve (P/V valve) shall be 100 percent performance tested at the factory for cracking pressure and leak rate at each specified pressure setting and shall be done in accordance with the latest adopted version of **TP-201.1E, *Leak Rate and Cracking Pressure of Pressure/Vacuum Vent Valves***. Each P/V valve shall be shipped with a card or label stating the performance specifications listed below and a statement that the valve was tested to and met these specifications.

    a. The pressure settings for the P/V valve
        Positive pressure setting of 3.0 ± 0.5 inches H_2O.
        Negative pressure setting of -8.0 ± 2.0 inches H_2O.

    b. The leak rate for each P/V valve, including connections, shall not exceed:
        0.05 CFH at 2.0 inches H_2O.
        0.21 CFH at -4.0 inches H_2O.

2. Each P/V valve shall have permanently affixed to it a yellow or gold label with black lettering listing the positive and negative pressure settings specified above. The lettering of the label shall have a minimum font size of 20.

Rotatable Product and Vapor Recovery Adaptors

1. The rotatable product and vapor recovery adaptors shall not leak.

2. The product adaptor cam and groove shall be manufactured in accordance with the cam and groove specifications shown in Figure 3A of CP-201.

3. The vapor recovery adaptor cam and groove shall be manufactured in accordance with the cam and groove specifications shown in Figure 3B of CP-201.

4. Each product and vapor recovery adaptor shall be 100 percent performance tested at the factory. Each adaptor shall have affixed to it a card or label stating the performance specification listed below and a statement that the adaptor was tested to and met the following specifications.

    a. The average static torque for the rotatable adaptor shall not exceed 108 pound-inch average static torque when tested in accordance with the latest adopted version of **TP-201.1B*, Static Torque of Rotatable Phase I Adaptors.***

    b. The rotatable adaptor shall be capable of rotating at least 360 degrees when tested in accordance with the latest adopted version of **TP-201.1B*, Static Torque of Rotatable Phase I Adaptors***.

Spill Container and Drain Valves

Each Spill Container Drain Valve shall be 100 percent performance tested at the factory. Each Spill Container Drain Valve shall have affixed to it a card or label stating the performance specifications listed below and a statement that the valve was tested to and met the following performance specification.

a. The maximum leakrate shall not exceed 0.17 CFH at 2.00 inches H_2O when tested in accordance with the latest adopted version of either **TP-201.1C, *Leak Rate of Drop Tube/Drain Valve*** or **TP-201.1D, *Leak Rate of Drop Tube Overfill Prevention Devices and Spill Container Drain Valves.***

Drop Tube Overfill Prevention Device

Each Drop Tube Overfill Prevention Device shall be 100 percent performance tested at the factory to verify that it does not exceed the maximum allowable leak rate. Each Drop Tube Overfill Prevention Device shall have affixed to it a card or label stating the performance specifications listed below and a statement that the device was tested to and met the following performance specification.

a. The maximum leak rate shall not exceed 0.17 CFH at 2.00 inches H_2O when tested in accordance with the latest adopted version of **TP-201.1D, *Leak Rate of Drop Tube Overfill Prevention Devices and Spill Container Drain Valves.***

Table 3-1
Manufacturing Component Standards and Specifications

Component	Test Method	Standard or Specification
Rotatable Phase I Adaptors	TP-201.1B	Minimum, 360-degree rotation Maximum, 108 pound-inch average static torque
Rotatable Phase I Adaptors	Micrometer	Cam and Groove Specifications (CP-201)
Overfill Prevention Device	TP-201.1D	$\leq$0.17 CFH at 2.00 inches H_2O
Spill Container Drain Valve	TP-201.1C or TP-201.1D	$\leq$0.17 CFH at 2.00 inches H_2O
Pressure/Vacuum Vent Valve	TP-201.1E	Positive Pressure: 3.0 $\pm$0.5 inches H_2O Negative Pressure: -8.0 $\pm$2.0 inches H_2O Leak rate: $\leq$ 0.05 CFH at +2.0 inches H_2O Leak rate: $\leq$ 0.21 CFH at -4.0 inches H_2O