**EXECUTIVE ORDER G-70-186**

**EXHIBIT 2**

**SPECIFICATIONS FOR THE HEALY MODEL 400 ORVR NOZZLE SYSTEM**

Typical installations of the Healy system are shown in Exhibit 2, Figures 5A through 5F.

**Nozzle**

1. The Healy Model 400 ORVR nozzle has a normal operating pressure range at the nozzle boot/fillpipe interface of -1/4 to 0 inches water column (wc) with a range of +/-1/4 inches wc (total allowable range is -1/2 to +1/4 wc). Pressure readings shall be taken pursuant to Procedure 2 of TP-201.3. Readings taken during a fueling of at least 5 gallons, excluding the first two gallons and last one gallon dispensed, shall be within the total allowable range. Readings outside the specified range, except during the excluded beginning and ending gallons, indicate a defective nozzle. A vacuum which exceeds 1/2 inches wc, or a pressure which exceeds 1/4 inches wc, indicates a defective nozzle or system, and the nozzle shall be immediately removed from service. This test must be performed using a certified test system or non-ORVR equipped vehicles.
   See Exhibit 5

**Note:** Vacuum or pressure levels outside of the specified range may occur during the beginning or end of the refueling operation when properly functioning equipment is affected by the following conditions: Gasoline dispensed into a vehicle fuel tank which is significantly warmer than the dispensed fuel may cause a vacuum of several inches. Conversely, gasoline dispensed into a vehicle tank, which is significantly cooler than the dispensed fuel may temporarily cause a pressure greater than 1/4 inches water column. The effect of temperature differential will be most pronounced at the beginning of the fueling operation and tend to gradually disappear toward the end of the fueling operation as fuel and vapor temperatures in the vehicle fuel tank equalize.

2. Nozzles shall be 100 percent performance checked at the factory, including checks of all shutoff mechanisms and of the integrity of the vapor path, and shall meet these specifications for the duration of the warranty. The maximum allowable leak rate for the nozzle vapor path shall not exceed the following:

   0.038 CFH at a pressure of two inches water column (2" WC), and
   0.005 CFH at a vacuum of eighty-three inches water column (approx. 3 psi).

3. The Model 400 ORVR nozzle is certified as a replacement part for use in facilities that have the decertified Model 400 nozzle (revocation of certification by Executive Order G-70-180). The Model 400 ORVR nozzles may be installed as the decertified Model 400 nozzles reach the end of their useful lives, and the facilities in which these nozzles are installed may have a mixture of the original Model 400 nozzles and the Model 400 ORVR nozzles until April 17, 2001. Such facilities must be in compliance with all requirements and specifications of this Order by April 17, 2001.
See Exhibit 2, page 4, SYSTEM MONITOR.

**Inverted Coaxial Hoses**

1. The maximum length of the hose shall not exceed 13 feet, provided that all hoses meet the following requirements:

   A. The length of hose, which may be in contact with the island and/or ground when the nozzle is properly mounted on the dispenser, is limited to six inches (6") per refueling point.

   B. A certified swivel is required at the nozzle end of the coaxial hose. A certified swivel on the dispenser end is optional.

**Inverted Coaxial Hose Adapters**

1. Inverted coaxial hose adapters shall be 100 percent performance checked at the factory to verify that they are 100% vapor tight. Adapters shall be maintained vapor tight.

**Breakaway Couplings**

1. Breakaway couplings shall be installed. Only certified breakaways with a valve that closes the vapor path when separated may be used. Any fueling point that does not have a breakaway which is CARB-certified for use with this system, and which does not contain a valve which closes the vapor path when separated, shall be cause for the local district to issue a notice to comply pursuant to Health and Safety Code Section 41960.2 (e).

**Central Vacuum Unit**

1. The Healy Model 400 ORVR system shall operate with at least one of the central vacuum units (pumps) specified in Exhibit 1.
(See Exhibit 2, Figures 2A-2D and Figure 3).

2. No dispensing shall be allowed when the central vacuum unit is disabled for maintenance or for any other reason unless the facility is operating under a district variance or upset/breakdown rule provision.

3. A threaded NPT tap of either 1/8" or 1/4" in diameter shall be provided on the inlet side of the central vacuum unit. The tap shall remain plugged and vapor tight except when test equipment is being connected or removed. The system shall not be allowed to operate when the tap is not vapor tight.

4 The normal vacuum levels observed during the efficiency testing of the Healy System with the three collection units are listed below (in inches of water column). The test was conducted at a site equipped with four multi-product dispensers (i.e. 8 fueling points.).

Based on the performance curves for each pump, the maximum number of fueling points that can be supported by each central vacuum unit is listed below. This number is based on an in use factor of (50%) and a demonstration of the maximum number of fueling points which can be operated simultaneously while the nozzles maintain vacuum levels within the normal operating range. The local district may require a demonstration of nozzle performance with the maximum number of simultaneous fueling points in operation. (See Exhibit 5.)

| Central Vacuum Unit | Maximum Number Of Fueling Points | Maximum Number of Simultaneous Fueling Points | Normal Operating Range For Vacuum Level | Vacuum Level Observed During Testing |
|---|---|---|---|---|
| **Healy 9000 Mini-Jet Pump** | **8** | **4** | **65" to 85" wc** | **68" to 79" wc** |
| **Thomas Industries / Franklin Electric VP 500 Vane Pump** | **10** | **5** | **65" to 85" wc** | **70" to 82" wc** |

The system shall operate within the vacuum level ranges specified above. Observation of a vacuum level below the specified range, for more than three seconds, measured while dispensing is occurring, is considered a failure of the system. For low vacuum levels less than 65 but greater than 60, a notice to comply shall be issued by the local District pursuant to Section 41960.2(e) of the Health and Safety Code. For low vacuum levels less than or equal to 60, all affected nozzles shall be tagged "Out of Order" pursuant to Section 41960.2(d).

For observation of vacuum levels above the specified range, the district shall issue a Notice to Comply pursuant to Health and Safety Code Section 41960.2 (e) for vacuum levels greater than 85 but less than 90. If the vacuum range is greater than or equal to 90, all affected nozzles shall be tagged "Out of Order" pursuant to Section 41960.2(d) of the Health and Safety Code.

To increase the maximum number of fueling points in a gasoline dispensing facility, two or more central vacuum units may be installed in parallel to maintain the necessary vacuum for the system as per manufacturer's instructions. The local district may require verification that the system can operate within the specified vacuum range with the maximum number of nozzles which may be used simultaneously.

5. A valve (such as a non-restrictive ball valve) shall be installed in the vapor return line such that the lines can be isolated from the underground storage tanks for the purpose of conducting the Vacuum Return Line Integrity Test as specified in Exhibit 4. **The valve shall remain open at all times except when the test is being conducted**. No product shall be dispensed when this valve is closed.

6. OSHA acceptable access to the central vacuum unit shall be provided immediately upon request for the purpose of inspection and testing.

## 9466 Check Valve

1. The 9466 Check Valve is an integral part of the vapor lines subject to high vacuum levels and its purpose is to slow the rate of vacuum decay in the vapor return lines after the vacuum source has shut off. This in turn decreases the ramp-up time necessary for the system to reach operating vacuum level when the system is re-energized. In larger stations with longer vapor return lines and greater internal volumes, the vapor check valve reduces the number of false "Low Vacuum" alarms recorded by the system monitor. The 9466 Check Valve is an integral part of the system and shall not be removed or bypassed during testing of the system.

## System Monitor

The Healy Model 400 ORVR system shall have a system monitor. Existing facilities that have the decertified Healy 400 System shall be in compliance with all requirements and specifications of this Order by April 17, 2001. The system monitor shall be installed in existing facilities once 50% of the decertified Healy 400 nozzles have been replaced by the Model 400 ORVR nozzles or by April 17, 2001, whichever comes first. See Exhibit 2, Figures 4A through 4G.

### System Monitor Vacuum Sensor

1. The monitor shall have a power light indicating the monitor has power at all times. The vacuum monitor portion shall have three system indicator lights. One light shall indicate that the vapor recovery system "motor" has power. The other two lights shall indicate the system is operating within either "normal" or "low" vacuum levels.

2. The monitor shall be set to light the "low" vacuum indicator at the beginning of dispensing when the system vacuum level is below sixty-five inches water column (65" WC). The run light shall be set to light when 65 inches water column or higher vacuum is present. The monitor shall sound an alarm and record a **vacuum failure** when the following condition occurs.

   The pressure switch does not sense sixty-five inches of vacuum being created within fifteen seconds of the time from which the system is energized for **three** consecutive dispensings, under normal operating conditions. Normal operating conditions defined as: All system components being installed and operating as specified in Exhibit 2.

**Note:** A normally operating system may, at times, fail to achieve the minimum 65" w.c. vacuum within the allowable fifteen seconds. This may occur when the system is initialized with little or no vacuum present in the Stage II piping network between the nozzles and the Healy Central Vacuum Unit. This in not an indication of a system failure unless it occurs for **three** consecutive dispensings under normal operating conditions. If the system fails to achieve the minimum vacuum of 65" w.c. for three consecutive refueling events, the local district shall use the enforcement criteria specified in Item 4 of the Central Vacuum Unit section of this document.

3 The system shall operate within the vacuum level range specified for each Healy Central Vacuum Unit. Observation of vacuum levels below the specified range, for more than three seconds, measured while dispensing is occurring, is considered a no-vacuum failure of the system. The low "vacuum" indicator light will flash on the monitor. The monitor shall sound an alarm and record a **no-vacuum failure** after one hour of a low vacuum condition. For observation of vacuum levels above the specified range, the local district shall use the enforcement criteria specified in Item 4 of the Central Vacuum Unit section of this document.

4 The system monitor shall be located in an area that is visible to station personnel while at their common workplace. The pressure sensor shall be capable of measuring the true vapor line vacuum and shall be installed in a location that will not cause interferences with normal flow characteristics.

**System Monitor Vent Sensor**

1. The Healy Model 400 ORVR system generates a high vacuum level in the vapor return lines. Any defect, which compromises the integrity of the vapor lines from the nozzles to the central vacuum unit, may cause the system to ingest large amounts of air. Excess air in the storage tanks causes excessive vent emissions when the pressure exceeds the pressure setting of the P/V vent valve (3" WC +/- 0.5" WC). The System Monitor shall, at a minimum, create a permanent record of system operation and ensure that leaks, which may cause excess emissions, will be detected.

2. The vent-sensing portion of the system monitor shall have two indicator lights. The vent light shall be set to light when venting is occurring. The excess light will be illuminated and the alarm will sound after ten hours of venting have has been recorded in a calendar day.

**Monitor Maintenance Log Requirement**

Any loss of integrity in the Stage II piping network between the nozzle and the Healy Central Vacuum Unit may cause excessive vent emissions which could trigger a VENT failure and/or VAC failure alarm condition detected by the Healy System Monitor. The Healy System Monitor, Model #6280, was developed to assure that such problems are quickly detected. The out of tolerance conditions the Monitor is designed to detect will cause a continuous audible alarm condition, the alarm may be silenced with a reset button, but will resound every four hours until the cause has been corrected. The station owner/operator shall call for maintenance within 24 hours of the initial alarm sounding and shall maintain a log of all alarms events and corresponding maintenance actions. This log shall be kept on site at all times and shall contain, at a minimum, the following information:

1. Date and Time of Alarm.
2. Type of Alarm(s).
3. Date and Time of Call for Maintenance.
4. Date Maintenance Performed.
5. Maintenance Contractors Name and Phone Number.
6. Maintenance Performed
   a. Test(s) Conducted.
   b. Test Results
   c. Components(s) Repaired or Replaced.

Test results, which document failures, shall be submitted for the purpose of tracking the performance of the system. Such test results shall not be a basis for any enforcement action, provided that the final test conducted demonstrates compliance with the specifications of certification.
Whenever a district finds a station in an alarm condition during an inspection, and the alarm condition is less than 24 hrs old, or the system has been in an alarm condition for no more than 72 hours and a call for maintenance has been placed, the district shall issue a Notice to Comply pursuant to Health and Safety Code Section 41960.2 (e).

Whenever the district finds a record of an alarm condition, if the operator provides the district, within seven days, with adequate evidence that the system was either restored to good working order within three days of the initial alarm, or was shut down and did not dispense fuel in the alarm condition, the operator shall not be subject to liability for the alarm condition provided any one of the following conditions are met:

1. The facility shut down and did not dispense fuel after the alarm sounded.

2. Maintenance, such as replacement of pressure indicator, was performed to correct a failure of the monitoring system, and there is no evidence of a loss of integrity in the high vacuum portion of the system or a failure of the system to collect vapor.

3. Failure to achieve the minimum vacuum level and/or a loss of integrity in the high vacuum portion of the system has not previously occurred within the last three months.

4. The system was in an alarm condition for one day, but the alarm condition did not occur on the following day, and diagnostic testing of the high vacuum portion found no loss of integrity with no maintenance being performed to the high vacuum portion of the system or to the vacuum source. Occasionally, an alarm condition is caused by something other than a failure of the Healy system. A Phase I delivery in which either a faulty Phase I system on the delivery tank, or incorrect procedures used by the driver, may cause the storage tank to pressurize. The district shall determine if a defective cargo tank is the cause and shall investigate repeated occurrences.

**Note:** Episodes of venting which are recorded but which do not exceed ten hours in a 24 hour period are not an indication of failure of the system and shall not be the basis for enforcement action. Venting which occurs through the 2" wc pressure valve is very low in volume and may occur from time to time during normal operation.

**The following may result in a Notice of Violation issued by the local district:**

Failure to call for maintenance within 24 hours of the initial alarm.

Failure to maintain the log as specified above.

Failure to log in alarm and/or corresponding maintenance action within 7 days of alarm event.

More than one alarm condition in a three-month period for which maintenance was necessary to correct a leak in the high-vacuum portion of the system, and/or to raise the vacuum level above the required minimum level.

## Vapor Recovery Piping Configurations

1. The maximum allowable pressure drop through the system, measured at a flow rate of 60 SCFH with dry Nitrogen gas, shall not exceed 0.50 inches water column. The pressure drop from the dispenser to the underground storage tank shall be measured so as to eliminate a blockage, which may be caused by the central unit in one of the following ways:

   If the central vacuum unit is located in the turbine pit, the pressure drop shall be measured from the dispenser riser to the central vacuum unit inlet

   If the central vacuum unit is not located in the turbine pit, the pressure drop shall be measured as indicated above and the pressure drop measured from the central vacuum unit outlet to the storage tank with the poppetted Phase I vapor connection open shall be measured and the results summed.

1. The recommended nominal inside diameter of the underground Phase II plumbing is as indicated in Exhibit 2, Figures 5A-5F. Smaller vapor lines are not recommended but may be used provided the pressure drop criteria specified above are met. The vapor return lines shall be manifolded below grade at the tanks as indicated in the figures. The above ground vent manifold may be used as an alternative to the underground manifold **only in existing installations** where the vapor piping is already installed, and where the installation does not expose the tanks, and is not approved for use in for new stations.

2. The dispenser shall be connected to the riser with either flexible or rigid material, which is listed for use with gasoline. The dispenser-to-riser connection shall be installed so that any liquid in the lines will drain toward the storage tank or Phase II line low point. The internal diameter of the connector, including all fittings, shall not be less than five-eighths inch (5/8") for factory equipped dispensers. Exception: Healy Model series Z0XXX vapor recovery retrofit kits. The Z0XXX series retrofit kits consist of two 0.5" OD copper tube and flare fittings connecting all hose outlet fittings on one side of the dispenser to a 1/2" pipe running vertically from the canopy to the base of the dispenser where 0.5" OD copper tubing and flare fittings continue to make connection to the underground vapor return riser. This piping configuration is required on each side of the dispenser.

3. All vapor return lines shall slope a minimum of 1/8 inch per foot. A slope of 1/4 inch or more per foot is recommended wherever feasible.

4. All vapor return and vent piping shall be installed, at a minimum, in accordance with the manufacturer's instructions and all applicable regulations.

## Underground Storage Tank (UST) Pressure

***WARNING***: Phase I fill caps should be opened with caution, because the storage tank may be under pressure.

1. The Healy Model 400 ORVR system was observed to have normal operating tank pressures less than 1-inch water column. Pressures that are consistently above the normal tank pressure levels, particularly pressures, which correlate with periods of vehicle fueling, may indicate system malfunction. In the event that high pressures in the storage tank are observed consistently, the owner or operator of the installation shall conduct, and pass, the Vacuum Return Line Integrity Test as specified in Exhibit 4 of this Order. Test results shall be made available to the district upon request within fifteen days after the test is conducted, or within fifteen days of the request. Alternative test procedures may be used if determined by the Executive Officer to yield comparable results. The local district may require the facility to cease operations when the integrity of the vapor lines is compromised.

## Phase I System

1. The Phase I system shall be a CARB-certified system which is in good working order and which demonstrates compliance with the static pressure decay test criteria contained in Exhibit 3 of this Order. Coaxial Phase I systems shall not be used with new installations of the system. Replacement of storage tanks at existing facilities, or modifications which cause the installation of new or replacement Phase I vapor recovery equipment, are considered new installations with regard to this prohibition. An exception to this prohibition may be made for coaxial Phase I systems CARB-certified after January 1, 1994, as compatible for use with Phase II systems which require pressure/vacuum vent valves.

   Where installation of the Healy Model 400 ORVR system is made by retrofitting previously installed equipment, local districts may elect to allow existing coaxial Phase I systems to remain in use for a specifically identified period of time provided the following conditions are met:

   The existing coaxial Phase I system is a poppeted, CARB-certified system capable of demonstrating ongoing compliance with the static pressure decay test as specified above; and

   Installation of the Phase II system requires no modification of the UST(s) and/or connections.

2. Spill containment manholes that have drain valves shall demonstrate compliance with the static pressure decay criteria with the drain valves installed as in normal operation.
3. Phase I Vapor Return spill containment manholes shall not have spring loaded drain valves installed. Existing facilities in which drain valves are installed may be plugged.

4. The Phase I vapor recovery system shall be operated during product deliveries so as to minimize the loss of vapors from the facility storage tank, which may be under pressure. There shall be no less than one vapor return hose connected for each product being delivered. Provided it is not in conflict with established safety procedures, and provided that the connection of the vapor hose to the cargo tank does not open the headspace to atmosphere, this may be accomplished in the following manner:

   The Phase I vapor return hose is connected to the delivery tank and to the delivery elbow before the elbow is connected to the facility storage tank

   The delivery tank vapor valve is opened only after all vapor connections have been made, and is closed before connection of any vapor return hoses;

   The existing coaxial Phase I equipment is in good working order and has demonstrated compliance with static pressure decay test criteria when tested with all fill caps removed; and

   The delivery tank vapor valve is closed after the product valve is closed, and

   The vapor return hose is disconnected from the facility storage tank before it is disconnected from the delivery tank.

5. All Phase I adapters, fittings and connections shall be maintained vapor tight. Whenever the local district finds a leak by using a commercial leak detection solution, the district may issue a notice to comply, pursuant to Health and Safety Code Section 41960.2 (e).

6. Storage tank vent piping shall be maintained white, silver or beige. Colors, which will similarly prevent heating of the system due to solar gain, may also be used, provided they are listed in the EPA AP-42 as having a factor the same as or better than that of the colors listed above.

7. Manholes shall be maintained in a color, which minimizes solar gain, as specified above. Manhole covers, which are color coded for product identification, are exempted from this requirement.

**Dispensing Rate**

1. The dispensing rate for installations of the Healy Model 400 ORVR System shall not exceed 10.0 gallons per minute when only one nozzle associated with the product supply pump is operating. This shall be determined as specified in Exhibit 6.