Executive Order G-70-165

Exhibit 4

Vapor Return Line Vacuum Integrity Test for the Healy Model 600 System

1. Applicability

1.1 This test procedure is used to verify the vapor tightness of the portion of the Healy system which is subjected to relatively high levels of vacuum in the vapor return lines. A defective vapor valve, or any other defect which compromises the integrity of the vapor lines from the nozzle to the central vacuum unit, may cause the ingestion of large amounts of air. Excess air in the storage tanks will cause significant vent emissions when the pressure exceeds the pressure setting of the P/V valve. Ingested air will also cause the evaporation of gasoline in the storage tanks and may result in observable product shrinkage.
Note: This test is required in addition to, and not as an alternative for, the static pressure decay test in Exhibit 3.

2. Principle

2.1 The vapor lines from the nozzle to the central vacuum unit are isolated from the underground storage tanks by closing the vapor and siphon line ball valves after activating the central vacuum unit. The unit is turned off and the vacuum is allowed to decay. The value is compared with an allowable value.

3. Range

3.1 If mechanical pressure gauges are employed, the full-scale range of the pressure gauges shall be zero to 100 inches water column (0 - 100" wc), to be sensed as vacuum. Maximum incremental graduations of the pressure gauge shall be 2 inches wc and the minimum accuracy of the gauge shall be three percent of full scale. The minimum diameter of the pressure gauge face shall be four (4) inches.

3.2 If an electronic pressure measuring device is used, the full scale range of the device shall not exceed zero to 200 inches water column (0 - 200" wc) with a minimum accuracy of 0.5 percent of full scale.

4. Interferences

4.1 Any attempts to dispense product during the test will open the lines being tested and invalidate the results.

5. Apparatus

5.1 Pressure Measuring Device. Use a pressure gauge, or an electronic pressure measuring device, set up to measure vacuum, to monitor the decay of the vacuum level in the vapor return lines. The pressure measuring device shall, at a minimum, be readable to 2 inches water column.

5.2 Stopwatch. Use a stopwatch accurate to within 0.2 seconds.

6. Pre-Test Procedures

6.1 There shall be no product dispensing during the test.

6.2 All pressure measuring device(s) shall be bench calibrated using either a reference gauge or incline manometer. Calibration shall be performed at 20, 50 and 80 percent of full scale. Accuracy shall be within two percent at each of these calibration points. Calibrations shall be conducted on a frequency not to exceed 90 days.

6.3 Remove the tap or quick-connect cap and install the pressure measuring device. The device shall be installed in the portion of the vapor line to be isolated.

7. Testing

7.1 Turn on the central vacuum unit (CVU) by activating a dispenser. The CVU is turned off by replacing the nozzle on the dispenser. Alternatively, the test may be conducted immediately following product dispensing.

7.2 Observe the vacuum level on the pressure measuring device. When the vacuum level is stable, or at the end of the dispensing operation, close the vapor and siphon line ball valves to isolate the vapor lines from the storage tanks (refer to Figures 4A-1 and 4A-2 for the location of the ball valves) and turn off the CVU by replacing the nozzle on the dispenser. If a stable vacuum level is not observed after one minute of CVU operation, or if the stable vacuum level is less than that indicated in Exhibit 2 as within the normal vacuum level for the CVU installed, turn off the CVU and check for problems before proceeding with the test.

7.3 Note the initial vacuum level and start the stopwatch. Record the vacuum level at one minute intervals. After five minutes, record the final vacuum level.

7.4 Calculate the difference between the final vacuum level and the initial vacuum level to obtain the observed change in vacuum. Note this value as the "measured ΔP". Estimate the total length of 2 inch diameter vapor return pipe from the dispensers to the CVU. Use this value to obtain the "calculated ΔP" in equation 4.1. If the "measured ΔP" is greater than the value obtained by equation 4-1, then a vapor

leak is evident and the system has failed. If the vacuum level does not decay more than the allowable level, proceed to Section 8.

$$\Delta P = 800/N \qquad \textbf{Equation 4.1}$$

Where:
N = The approximate length of 2 inch vapor return pipe from the dispensers to the central vacuum unit to the nearest 20 feet .

ΔP = the observed change in vacuum level in inches of water column during a five minute observation period.

(Note: If the station contains 3 inch vapor return pipes, multiply the answer in Equation 4.1 by 0.5. This equation is based on an allowable leak rate of 0.08 gallons per minute.)

7.5 If the system has failed to meet the criteria set forth in Section 7.4, repair and replace defective components as necessary and repeat the test. Defective nozzles or other components may be diagnosed by bagging with bags containing air and observing collapse of the bags, or by otherwise isolating suspected components. Note that this is only for diagnostic purposes; the test shall not be conducted with any bagged or isolated components.

7.6 If the system contains more than one CVU, repeat for each CVU and associated piping.

8. Post-Test Procedures

8.1 Remove the pressure measuring device and plug or cap to ensure that the connection point is leak tight.

8.2 Open the valves which were closed to isolate the vapor return lines.

9. Reporting

9.1 The observed initial, interim and final vacuum levels observed, the type of pressure measuring device (including range and accuracy and date of last calibration), the number of nozzles associated with the CVU and the measured ΔP shall be reported.