Progress Report on Response to CAPCOA Vapor Recovery Committee Recommendations as of September 2, 1998

I. SHORT-TERM COMPLIANCE

(a) Request that ARB supply dates to the districts regarding the availability of certified repair kits for OPW nozzles and for WayneVac piping upgrade kits.

ARB certified the upgrade piping kits for the WayneVac systems on May 6, 1998. The installation of upgrade kits for the WayneVac systems has been completed in the South Coast AQMD, and is currently underway in the Bay Area AQMD. Wayne anticipates that all of the conversions in the state will be completed by January 1, 1999.

ARB certified the new spout nut and retention ring for use with the certified stainless steel spout on April 4, 1998. OPW reports that all aluminum spouts in the possession of distributors and service stations contractors have been recalled and replaced with the stainless steel spouts. New nozzles with aluminum spouts were fitted with stainless steel spouts. All production of aluminum spout kits and nozzles with aluminum spouts has ceased. OPW reports that stainless steel spout kits and vapor path kits are available through their distributors. ARB is awaiting OPW's response to the recommendation for further improvements to the vapor path. OPW has committed to obtaining, from service station contractors, additional failed vapor paths to investigate the cause(s) of the failures.

(b) Recommendation that ARB immediately halt further installations of the OPW 11VAI nozzles with aluminum spouts. Recommendation that ARB should evaluate the OPW model 12V nozzle as a replacement and/or authorize replacing existing OPW 11VAI aluminum spouts with stainless steel spouts and a more secure spout nut.

ARB gave concurrence to all the districts in the state to prohibit the installation of OPW 11V-series nozzles with aluminum spouts, except on systems for which no other nozzle is certified, in a letter from Michael Kenny to Ellen Garvey of the Bay Area AQMD, dated April 28, 1998.

The OPW 12V nozzle was installed for testing in two stations, one equipped with a WayneVac system and the other equipped with a VaporVac system, and operational tests begun. The tests were terminated at both sites due to failures. OPW has made some improvements, including increasing the number of spout screws from one to three, and replacing the plastic spout tip insert with a metal insert, and has just begun a new operational test at those sites. ARB will do everything possible to expedite the certification of this nozzle as soon as it has passed all of the required testing.

The recommendations also contained the following statements:
"District data also indicate liquid is being ingested into the vapor path from defective aluminum nozzles"
"Finally, if the OPW model 12V is required to use stainless steel because of wear problems, then that should apply to other nozzle manufacturers as well. This is necessary to ensure conformity and maintain spout roundness for ORVR fueling compatibility. The districts have found stainless spouts on OPW nozzles in service for over three years. All looked good and passed the A/L and A-V/L tests."

All vapor recovery nozzles consist of an aluminum nozzle body with a spout which is typically made of aluminum. The OPW 11VAA nozzle was designed with a stainless steel spout, and the original certification tests of the 11VAA and 11VAI nozzles were conducted on nozzles with stainless steel spouts. The design proved to be robust and performed well, but was problematic because of the shear groove. The shear groove is normally located on base of the spout. However, the stainless steel spout design located the shear groove on the spout nut, with the shear groove near the body of the nozzle. This made removal of the remainder of the spout nut after shearing difficult. In addition, the latching springs were sometimes found missing. OPW applied for certification of an alternative aluminum spout, which was granted after testing revealed no problems. Field investigations of the recently found problems revealed that the aluminum spout design is not as robust as the stainless steel spout design, and resulted in a variety of types of failures, as demonstrated by district testing. In an effort to avoid decertification of the nozzle, OPW ceased production of the aluminum spouts and began producing the stainless spouts, with an improved spout ring and an additional retention ring to assure that the latching spring remained correctly installed. The superiority of the stainless steel spout is attributable to the superiority of the design, rather than to the materials. The problems, which were caused by the aluminum spout design, have not been found to occur on other aluminum spouts of different designs. Therefore, mandating a change in the material and design of other manufacturers' spouts is not warranted at this time.

(c) Recommendation to halt the installation and replacement of hoses with internal vapor tubes prone to developing vapor path restrictions.
"One hose that can minimize this problem is made by Thermoid."

ARB is working to determine the magnitude of, and solutions to, this problem. The only data which has been presented to the ARB was presented by the Bay Area AQMD, in which A/L tests revealed 440 failures out of 921 fueling points tested. Data on the 364 repairs necessary to bring 294 fueling points into compliance with the A/L ratio requirements, shows that it was necessary to replace 4 hoses. Because this problem, although significant, is a failure rate of less than half of one percent, ARB does not think that halting the installation of all but one type of hose is warranted at this time. In addition, additional testing of the Thermoid hose is advisable to determine whether, although it does not

develop the permanent kinks found in the other hoses, it does not collapse temporarily during use when the hose is extended. One applicant is for certification of a configuration with a retractor clamp designed to prevent kinking of the hose is currently under test, and Dayco will begin testing of an improved whip hose, designed to prevent kinking of the inner hose, as soon as they can produce and install them. I would like to remind you that the "curley-Q" configuration is not included in the WayneVac certification and is not certified for use with that system.

(d) **Recommendation that ARB require, as part of the applicable Executive Order, that no dispenser be used following a drive-off until the dispenser has passed an A/L test. As an alternative, a contractor who does not have A/L test equipment should be required to examine the inner hose for kinks and should check the dispenser piping for leaks using a soap solution at a pressure of at least ten inches water column gauge to eliminate any leaks. All drive-off should be logged.**

In response to a request by ARB, a WSPA representative surveyed some of WSPA's members in an effort to get an estimate of the number of drive-offs, which occur per year in California. Three companies responded, with estimates, which ranged from 126,000 to 250,000 per year. It is difficult to estimate, because some stations experience relatively few drive-offs, while others experience relatively many. In addition, in some instances the customer becomes aware of the occurrence and recouples the breakaway, leaving the station operator unaware that it occurred. The only data which has submitted to ARB is from the testing conducted by the Bay Area AQMD staff, in which A/L tests revealed 440 failures out of 921 fueling points tested. Of the 364 repairs necessary to bring 294 non-complying fueling points into compliance, five involved breakaway valves. As noted earlier, the number of hoses which required replacement in this population was four. Assuming that these involved different fueling points, this indicates that a failure rate of only one percent involved components which may have been damaged by drive-offs. Of the five breakaways found to be defective, four had visually detectable defects, such as incorrectly coupled parts and/or seeping fuel, and would have been observed by a competent inspector. The cost of implementing your recommendation can be estimated as follows. A station visit by a contractor to conduct an A/L test, or to dismantle and reassemble the hose, and conduct leak testing, is estimated to be approximately $200.00 per occurrence, or as much as $50,000,000/yr. The cost of lost business while the entire dispenser is shut down until a maintenance contractor can be located to make an unscheduled site visit must also be added to this estimate. In addition, the emissions caused by conducting the A/L tests and/or removing, draining and dismantling hoses to inspect the inner hoses far exceeds the emissions prevented by this requirement. Finally, there is no assurance that this would assure the detection of breakaways incorrectly recoupled by unsettled customers. Therefore, in the absence of compelling evidence that the economic and environmental

benefits and costs of the solution are warranted by the magnitude of the problem, the recommended action does not appear to be justifiable.

(e) **Recommendation that industry should immediately adopt the "bag test" procedure to verify that air is not being ingested into nozzles. It was suggested that the districts use an ARB approved A/L test rather than rely on the bag method because the bag test did not detect all nozzle leaks that can affect the A/L.**

ARB concurs that the "bag test" is an excellent tool which can be used by station operators who are currently frustrated because they are unable to detect problems and prevent being tagged out of service after district inspections. Although the "bag test" may not definitively identify marginal failures, it is clearly an excellent and easy to use tool for finding the types of failures that cause the greatest emissions. ARB recommends that district inspectors use the "bag test" method as an additional inspection tool to identify those fueling points with significant defects, which can then be verified through the use of an A/L test. In addition, the "bag test" is an excellent diagnostic tool for determining whether a nozzle that fails an A/L test is, in itself, defective, or if the low A/L ratio was caused leaks in the vapor path or vapor valve of another nozzle associated with a common vacuum source. Modifications have been made to the A/L test regarding the bag test. This test is scheduled to go to the Board for adoption as part of the next Board item.

(f) **Require systems to be installed and maintained gas-tight between the nozzle spout and the inlet of the vacuum pump. This can be done using soap solution with the system pressurized to at least ten inches water column gauge or by using an equivalent vacuum test developed by ARB.**

The ARB certification executive orders currently in effect require compliance with all the test procedures with which the test station was required to comply, including the static pressure decay test of the integrity of the station. ARB staff has been working with the staff of both Dresser Wayne and the San Diego County APCD on this issue. Work is continuing on the 27" vacuum test, which ARB staff prefers to the 10" pressure test for equipment, which operates under vacuum of 15 to 30 " water column. ARB staff is also developing test apparatus which can be used to test the Phase I fill tubes at 10" water column without pressuring the entire system, and which can be performed without shutting down the station. ARB is formalizing the test procedures for inclusion in the workshops and the package currently being prepared for presentation to the Board in the first half of 1999.

With regard to the WayneVac site mentioned in the discussion, conversations between staff of ARB and the San Diego County APCD led ARB to suspect that the San Diego test facility was not consistent with the certified configuration, which do not contain copper tubing or brass fittings. ARB has been consistently

increasing the detail contained in the certification executive orders, and will continue to do so. The more recent executive orders are available to be downloaded from the Internet, and some of those being finalized now contain detailed drawings in color.

(g) **Recommendation that the current WayneVac manifolds that are prone to liquid retention in the dispensers should be replaced with an ARB approved WayneVac design within a perscribed period mandated by ARB.**

Upgrade kits were developed quickly by Dresser/Wayne, and were certified by ARB on May 6, 1998. The certification contained drawings of all the configurations which were certified, and is available on the internet. As noted above, Dresser/Wayne has completed installation of the upgrade kits in the Mobil station in the South Coast AQMD, and anticipates that the remainder of the state will be complete by January 1, 1999.

(h) **Recommendation that ARB immediately require the primary system manufacturers develop a "pressure drop budget" for their respective systems at a standard flow rate determined by ARB, CAPCOA and industry.**

ARB has been working with industry on this issue, and is in the process of building a test bench. In addition, the Gasoline Pump Manufacturers have formed a committee, chaired by Dresser/Wayne, to work on this project. This is one of the program improvements, which have been identified for inclusion in the next Board item.

(i) **Recommendation that ARB require, in the certification executive orders, that primary system manufacturers should develop installation guidelines involving the use of approved industry trained contractors. The executive orders should require pretesting using manufacturers' methods agreed to by ARB and the CAPCOA Vapor Recovery Committee. ARB should also require the manufacturers to prepare an on-going preventive maintenance program for use by them and others, including the training of maintenance personnel. The maintenance program should be referenced in the applicable executive orders.**

The current certification executive orders require that ARB-approved installation and maintenance manuals be provided to each station owner/operator. The districts may wish to include, as part of the permitting process, verification that the manuals were provided as required. Many of the manufacturers provide training for their associated service personnel, but do not have the authority to require the station owners/operators to use only those personnel. ARB is working with industry to determine how best to ensure that installation and maintenance contractors have the necessary training. In addition, ARB is including, as part of

the enhanced vapor recovery package being prepared for presentation to the Board, clarification of the warranty and liability requirements to which applicants for certification must agree.

(j) Recommendation that ARB require all systems to be A/L tested without first removing liquid in the vapor path.

The modified A/L test procedure, which will be taken to the Board for approval, now contains this prohibition.

(k) Recommendation that ARB require a maintenance log to be maintained identifying all repairs and testing and the contractors doing the work. This should be kept on site and made available to districts upon request and at the time of the annual test.

At ARB's request, WSPA is developing a pilot program to track maintenance and equipment reliability. Staff of ARB and WSPA have met to discuss how this can be most effectively accomplished. The pilot program will be used to test the usefulness of such logs.

(l) Recommendation that ARB prohibit further installations of vacuum-assist systems that manifold storage tank vapor spaces only through atmospheric vents.

All certification executive orders issued since at least 1993 permit manifolding at the vents only in existing facilities which are being retrofitted with a vacuum-assist system, where manifolding underground would require breaking concrete which would not otherwise be necessary. All new installations, and all modified installations in which the vapor piping is exposed to the tanks, must be manifolded underground. This is specified in the certification executive orders. If the conversion is from balance to vacuum-assist, the tanks should be manifolded below ground unless the vapor piping is dedicated because balance system certifications have never allowed manifolding aboveground. The districts have the authority in the permitting process to enforce these requirements.

(m) Recommendation that ARB decertify pressure-vacuum vent valves that are prone to leakage.

ARB is awaiting data, which staff of San Diego County APCD indicated they would provide, documenting this problem. In addition, ARB staff is building test apparatus which will make it possible to test new P/V valves at the parts houses. ARB also recommends that vent pipes be manifolded into one P/V valve to reduce the potential leak sources in stations, and that leak tests be conducted with the valves in place to verify the integrity of the P/V valve as installed. It is ARB's longstanding policy to investigate equipment complaints and take appropriate action to correct problems.

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May 6, 1998

Mr. Michael P. Kenny
Executive Officer
California Air Resources Board
2020 "L" Street
Sacramento, CA 95814

RE: VAPOR RECOVERY ISSUES

Dear Mr. Kenny:

As you know, CAPCOA has been very concerned about the decreased emission reductions being achieved in the vapor recovery program, specifically from bootless nozzle systems. These reductions are crucial in local districts achieving the ambient air quality standards.

We appreciate the work ARB has done so far in trying to address these difficult and complex issues. The CAPCOA Vapor Recovery Committee has been working with your staff on these issues for a number of months now. The Committee, which represents a wide range of statewide expertise, has provided a series of recommendations, dated April 20 (attached), which we believe will adequately address the bootless nozzle problems.

CAPCOA asks that the Air Resources Board give full consideration to these recommendations, and is looking forward to continuing our joint efforts to achieve full emission reductions from these systems.

Sincerely,

Michael Kussow
CAPCOA President

Attachment

c: James Morgester, ARB Compliance Division
William Luscutoff, ARB Monitoring & Laboratory Division