To: Dr. R. A. Kehoe

From: J. Cholak

Subject: Standard Research Corporation - Program for the investigation of the environment during the indoor fueling with gasoline containing X-105A

Introduction

The Kettering Laboratory will have the responsibility for all lead-in-air determinations connected with an investigation which will consist of three phases as follows:

1. The concentrations of lead in the air during a two-week period when commercial stock containing 1.7 ml. TEL per gallon will be used.

2. A three-week period in which the concentration of TEL in the fuel will be increased to 3 ml. per gallon.

3. Phase 2 will be followed with a three-week period during which time the test fleet will be fueled with gasoline containing X-105A at a concentration equal in indoor strength to the TEL in phase 2.

The Program

The following program of testing has been set up for the blending, loading, transportation and indoor fueling operations.

A. Blending

Air samples will be collected with the Ethyl lead-in-air analyzer during the time that the blends to be used in phases 2 and 3 will be prepared in the Deck Tank area behind #4 District Office in Richmond. The following samples will be obtained:

1. Before blending operations are begun (Base line).
2. Each time stand pipes are changed.
3. During the blending operation.
4. After the blending operations have been completed.
5. While the operator sets the lines to the tank.
6. While the operator samples the tanks.

Three blends will be investigated - the fuel used in phase 2 and that to be used in phase 3, which will require two blendings, one with 1300 pounds of X-105A mix in 55-gallon drums, and another when 500 pounds in 10-gallon drums will be added to the gasoline.

B. Loading and Transport

The lead-in-air analyzer will be used to determine the concentrations of lead in the air at the breathing zone of the drivers of the tank trucks which will be used to carry fuel from the Richmond loading dock to the Northside sales bulk plant in San Francisco. It was estimated that about 20 truck loadings will be required for each blend to be used in phases 2 and 3. Five loadings with each type of fuel will be investigated. Several tests to determine the concentrations of lead at ground level during these loadings will also be made.

A limited number of determinations (1 or 2 for each blend) will be made at ground level while fuel is being pumped from the truck to the storage tanks in the San Francisco sales bulk plant. The final loading of tank trucks for transfer of the fuel to the test site will be investigated in a manner similar to that used in the case of the Richmond loading dock.

Mr. Hancock will record all data such as pertinent weather conditions, air movements, temperature and type of activity on the days that each test will be carried out.

C. Fueling Operations

The lead-in-air analyzer will be used to determine the total lead in the air at the breathing zone level on the fueling islands.

1. These determinations will be made every other day during the periods (3:00 P.M. - 5:00 P.M. and 11:00 P.M. - 1:00 A.M.) of peak activity. Determinations of the lead content of the air will be made at the beginning, middle and end of each peak period.

2. Every third sample will be collected so that the lead in the particulate matter can be determined along with the gaseous lead. A series of samplers consisting of a filter head fitted with a Millipore or Whatman #42 filter paper placed ahead of the scrubber will be used for obtaining this distribution. The collections of particulate matter by this equipment will be scheduled so that the entire peak period will be covered (one day at the beginning of the period, the next during the middle and the third day at the end of the period, etc.).

3. Air samples will also be collected in areas other than the fueling islands during the peak periods and at other times of the day and night. As was the case in 2 directly above, particulate matter will be collected for every third sample.

4. An A.I.S.I smoke sampler will be set up about 20 feet from the fueling island to collect particulate matter continuously during the three phases of the investigation. The individual spots (each for 1 hour duration) will be used to determine the pattern of the diurnal variation of lead in the particulate matter.

5. Mr. Hancock will log such data as air movement, temperature and activity in the area.

6. Measurements of the concentrations of carbon monoxide in the air will be made at frequent intervals in various locations of the indoor fueling area.

7. A limited number (3-4) of lead-in-air determinations will be made when fuel is dropped to the storage tanks beneath the sidewalk outside the building.

Mr. Hancock will attempt to supply us with the lead readings on a daily basis. All filter samples and tapes from the A.I.S.I smoke sampler will be shipped to the Kettering Laboratory at the end of each week of testing. Solutions from lead-in-air samples that exceed the color limit of the comparator will be rinsed into four-ounze jars and shipped to the Kettering Laboratory for final estimation of their content of lead. The following code will be used to identify the samples collected at the different sites.

A+ number = Blending
B+ number = Richmond loading rack
C+ number = San Francisco sales bulk plant
D = High volume car fueling area

The equipment needed to carry out the investigation is available in San Francisco. The work with phase 1 is expected to begin at the fueling area on April 28.

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