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Chicago, Illinois
July 15, 1940

Mr. O. B. Lewis

Dear Oscar:

In accordance with your recent request, I visited one of the Phillips Construction Company jobs for the Standard Oil Company at Attica, Indiana, where I observed their methods or practices in connection with the installation of a bulk head in an old horizontal storage tank. I will attempt to describe the various operations in the order which they occurred.

Failure to secure notification on this job in ample time, resulted in my arriving after the cleaning operation had been completed. Therefore, the first part of the following description is based upon advice from their superintendent.

I might state, first, that their equipment consists of a large truck on which is mounted two motor driven electric welding sets. The truck is also equipped with kerosene heater and boiler for steaming purposes, as well as with a portable condenser for testing purposes. They carry on the truck a portable gasoline driven blower which is used for ventilation of the tanks. A great number of miscellaneous minor items, such as block and tackle, jacks, etc. are carried. They have available both foam and carbon tetrachloride fire extinguishers, in various sizes. About the only safety equipment carried in which we are interested is a Davis Combustible Gas Indicator.

Prior to the arrival of the Phillips people on the job, the tank to be remodeled has, as a rule, been emptied by drawing off all of its contents possible. The Phillips men then jack up one end of the tank, opposite the bottom draw-off connection, to facilitate drainage of the tank contents. The majority of the tanks on which they work are horizontal, varying from 200 to 350 barrel capacity.

After the tank has been lifted at one end the top manhole covering and other openings are opened and steam turned into the tank for one half hour. The portable blower is then put in place at the top manhole and both steaming and ventilation of the tank is carried on for another one and one half hour minimum, or until the tank is gas free by instrument test.

Two men then enter the tank and, with ordinary shovels, scrape up and remove all foreign material, in the nature of sediment, sludge or scale which they may find in the tank. No effort is made to dry the tank, however they state that there is never any liquid present in the form of pools but that the tank is usually moist from the steaming operation.

The sludge taken from the tank is disposed of in any convenient manner they find available.

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No rubber gloves, boots or the usual precautions against lead exposures are used in the operation.

Without further precautions against any type of hazard, the men then proceed with the work of installing the new bulkhead, manholes and other repairs. The other end of the tank is then jacked up sufficiently high to allow rollers to be placed under both ends. Working from the outside, the top man way is cut out with an acetylene torch and the old draw off nozzle is removed and openings for the new manholes are cut in the bottom of the tank. The next operation is to cut a semi-circular slot, approximately 1/2" wide, at the center of the tank, on the bottom half. The bulkhead, which comes in two half circles, is then slipped into the tank through this slot. Semi-circular angles are then placed inside the tank through one of the manhole openings. These angles are placed in position and spot welded - the man working on the inside for this operation.

After the angles are in place, the lower half of the new bulkhead is set against it, spot welded on one side to hold it in place, and then completely welded on the opposite side. This operation requires approximately three or four hours time - at least that was the time required on the particular job which I observed. During this time, the man doing the welding did not leave the inside of the tank. Drinking water and other items which he might need were handed up to him. During the time that he was working inside, another welder was working on the outside on repairs of various kinds, including the re-welding of the 1/2" slot which had been cut in the tank for the purpose of installing the bulkhead steel.

After the first half of the bulkhead had been welded into place, the operator left the tank and, by means of a block and tackle and the rollers which had been placed between the tank and the concrete foundations, the tank was rotated through 180 degrees to facilitate the installation of the second half of the new bulkhead. There was about a two or three hour interval while this work was being done, during which time no one was inside of the tank.

After the tank had been placed in its new position, one man-re-entered the tank and completed the work of welding the bulkhead in place. This second operation required approximately an hour's longer work inside the tank than the first, due to the horizontal weld necessary to connect the two plates. During the time the man was inside welding, the old manhole opening was plated over and other outside welding work was being carried on, including the placing of new man-ways and new tank nozzles.

This particular day that I observed this work, the outside temperature was around 100° and it is safe to say that the temperature inside of the tank, due to the hot work being done on it, was at least 130 or 140° F. and perhaps even higher. In this case the blower was used to ventilate the tank, due to the extreme temperature inside of it. This is not a common practice, however, except on extremely hot days.

I give you this information as it might possibly throw some light on the degree of hazard, if any, under which these operators are working. One man formerly with this particular crew had left the job due to the severe physical conditions under which he was forced to work.

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The men are putting in sixty three hour weeks and this particular crew has been continuously employed on this work for over a year, with only nine days off in the form of a vacation last December.

They advise that, during the past year, they have done on an average of two and one half such jobs each week, which will give a fair idea of the conditions and frequency of possible exposure to lead. They advise, however, that only about one third of the tanks so worked on during the past year had been in gasoline service at the time immediately prior to the beginning of their work.

It is my intention to be present, as soon as possible, during the time they are steaming and cleaning one of the tanks. For this purpose, I have secured their itinerary for the next few weeks and will give you another report after I have actually observed this cleaning and steaming procedure.

Needless to say, I did not mention the lead hazard except in a very minor manner which was almost necessary in order to explain my interest in being around the job for a day and a half. *Common Latin*

If there is additional information which you would like on this subject, not covered above, kindly advise and we will be glad to secure it.

Very truly yours,

(S) B. G. Crane

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