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October 6, 1930.

Mr. J. G. Martin,

Dear Jack:

I will give you, as briefly as possible, all the details pertaining to the fire at the Champlin Refining Company, Enid, Oklahoma, on Thursday, October 2nd, 1930, at 2:30 P.M.

The circulating pump at the Ethyl plant was located in a small room, which was reasonably air-tight. It seems that in starting the pump on the morning above mentioned, there was some difficulty in relieving a vapor lock, which I believe was caused by a 1200 ft. suction line. In relieving the vapor lock, the pump operator screwed a petcock completely out, which left an opening of at least a quarter of an inch in the head of the pump. The pump was again started, but after a few minutes of operation, it was necessary to shut down, and relieve a similar condition. It seems that in starting the pump the second time, the switch caused a spark, which in turn resulted in an explosion.

I imagine that this room must have had very close to a carburetor mixture by this time. All points in the switch mentioned above were supposed to be submerged in oil, but we have no way of knowing that they were. When I inspected the pump, after the fire, the petcock I have above mentioned was not screwed back, but was on the floor beside the pump, which proves that at the time of the explosion, and for some time after that, we must have had an unusual amount of gasoline vapors in and around this pump. Shortly after the explosion, all lines were cut off leading to the Ethyl blending plant and the ten men who were engaged in fire fighting centered their attentions on the gasoline, which was burning in the pump room. It seems that in a very short time, the roof of the blending plant collapsed, which covered the entire storage platform and blending platform, causing an unusual amount of heat in and around the Ethyl drums.

The first drum of Ethyl fluid to explode naturally had less heat and did not burn completely, spilling fluid on two tank cars which were at the loading rack at this time, and also spilling fluid on the mixing platform and ground for a radius of ten to fifteen feet. After the first explosion, the men who were fighting the fire noticed a very peculiar odor. Mr. Slater, the refinery superintendent, realized that the fumes were serious and had all men with their fomite machines moved around at a safe distance of approximately 150 ft., with the wind to their backs. They remained at these points until all thirty-seven drums of Ethyl fluid had exploded. After the first explosion, there was a very short period of time elapsed until the second drum exploded, but at this explosion, they had an entirely different condition. The second drum to explode came out, in my opinion, as a gas, which went straight up approximately 200 ft., then drifted with the wind, burning more or less as a huge ball, with a bluish and yellowish tint. The remaining 35 drums did likewise. There was no fluid apparently after the first explosion, which was very fortunate for all concerned.

I received word of this fire at 2:15 Thursday afternoon and immediately left for Enid, and found the following conditions.

As shown in picture #1, the Ethyl plant was a total loss. Picture #2 shows the East end of the blending plant, the ground beneath and for a radius of 25 or 30 ft. had a small amount of Ethyl fluid and an unusually strong odor was apparent, as you approached the blending plant from any direction. The first thing I did, upon my arrival,

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was to have them discontinue flooding this area with water, which they had been doing for several hours, causing the fluid to float down a ditch for a distance of 200 ft. After discontinuing this, I next had them bury the ditch and drain with four feet of dirt. We next unloaded some fifteen to twenty truck loads of fuller's earth which was scattered over the entire area surrounding the Ethyl blending plant. We continued to haul dirt and earth until all odor and signs of Ethyl fluid had been completely buried. I next inspected the Ethyl platform itself, and found, to my surprise, that there was no fluid whatsoever in any drum, and very little odor. What little odor there was, was fluid which had been spilled at the explosion of the first drum. After removing all drums, pipe connections, wire fence, etc., the platform was flooded with kerosene five times, and more dirt added to our fill. The drums, fence, pipe connections, etc. have been hauled to a vacant piece of property owned by Champlin and burned a second time. Picture #3 was taken from the top of a tank car and shows very plainly the conditions of the drums immediately after the fire. This part of the platform contained nothing but full drums and still there was no odor or any sign of Ethyl fluid. I feel quite positive that this is true, due to the fact that I was the first man to inspect these drums and in fact, was the first man to approach the area itself, after the first was extinquished. Picture #4 is nothing more than a view of two Ethyl drums showing exactly what happened to the ends, also, showing how clean they were inside. The drum on the right contains some water but no fluid.

Summing up the entire situation, I would like at this time to offer a few suggestions, as well as comments, from a personal viewpoint.

In the first place, no circulating pump in an Ethyl plant should have a 1200 ft. suction line for this reason: a line 1200 ft long naturally has an unusually large amount of gasoline vapor or will have as soon as the pump is started. The pump I am referring to is an electric driven centrifical pump, with a capacity of 1,000 gallons per minute. There is a possibility that the explosion could have been avoided had we been able to flood the platform with a sprinkler system, which should have had a tendency to keep our drums cool long enough for the fire to have been put out. I firmly believe that each and every gasoline plant, including tank car installations, should be equipped with the most efficient sprinkler system possible, and if possible, a valve at a safe distance from the plant where in case of necessity, if a fire has started, this valve could be opened without involving any great danger.

Personally, I believe steam pumps are much more satisfactory in every respect, surely there could not be enough difference between the steam and electricity for us to take any chance whatsoever of having this happen again. I would recommend that all Ethyl Gasoline plants use steam pumps only, if it is at all possible. If not, the pumps should be isolated to some degree which will possibly avoid a recurrence of this kind.

I sincerely hope the above report covers this accident enough in detail, so that we may be able to avoid a similar accident. I have given you this report to the best of my knowledge and I handled the situation to the best of my ability.

Hoping the above meets with your approval, I am,

Yours very truly,

(Signed) Bob Graham