STATE BOARD OF EQUALIZATION

OFFICE CORRESPONDENCE

440.2500

Place: Sacramento
Date: April 6, 1955

To: Mr. E. H. Stetson

From: Mr. W. W. Mangels

Re: The B--- O--- C--- of C---, Inc.
The B--- O--- C--- of C---
XXX --- ---
--- XX, Ohio Account No. OS-X-XXXXX

Mr. Ekstrom inquires whether B--- should be regarded as a consumer of acetone which it places in cylinders in which acetylene will be stored.

First of all, please refer to your exchanges of correspondence dated April 12, 1948, April 27, 1948, May 7, 1948 and May 20, 1948 with the N--- C--- G--- Co. (X-XXXX) with respect to this same question. Also see the memorandum of December 8, 1954, from Chicago – Auditing to Mr. Ekstrom.

I have discussed with Mr. R--- Z. R--- and Mr. J--- B. L--- of the Bureau of Chemistry, Department of Agriculture, the reason why persons who sell acetylene dissolve the acetylene in acetone in the cylinder. I also read about the characteristics of acetylene cylinders in the Encyclopedia of Chemical Technology, Volume 1, pages 112 through 114, by Kirk and Othmer.

It is specifically stated therein that at pressures somewhat above 15 pounds per square inch (gauge) acetylene often breaks down with explosive violence into its constituent elements, if a spark or other ignition source is present. Therefore, acetylene cylinders are constructed in such a way to avoid explosions resulting from the hazard of high-pressure acetylene. One basic feature of safe construction of the cylinders is to use acetone as a solvent of the acetylene. Acetone dissolves may times its own volume of acetylene; solubility increasing with rising pressure, and with diminishing temperature. Incidentally, the other safety feature is to pack in the cylinder a porous mass with extremely minute cellular spaces so that no pockets of appreciable size remain where “free” acetylene in gaseous form can collect.

It is also noted that acetylene cylinders are often fitted with safety devices to release acetylene if there be an abnormally high temperature, as for example resulting from fire. In acetylene cylinders manufactured in the United States these safety devices contain a fusible metal that melts at about the temperature of boiling water. In large cylinders the devices take the form of replaceable plugs with a core of the fusible metal.

Ito is also to be noted that the Interstate Commerce Commission has issued regulations which follow the regulations of the Bureau of Explosives of the Association of American Railroads. The Bureau of Explosives requests and rigidly enforces its regulation that when an acetylene cylinder is filled its internal pressure may not exceed 250 pounds per square inch (gauge) at 70° F.

It is also to be noted that the cylinder and the piping therein is heavily constructed to withstand the maximum possible decomposition force to which the acetylene within might subject them.

It is clear therefore that the purpose of placing the acetone in the cylinder is to prevent explosions. It is also the opinion of Mr. R--- and Mr. L--- that the acetone will remain in the cylinder until the acetylene is to be used and when the acetylene is used most of the acetone will dissipate, and therefore most of it will not be in the cylinder when that returnable container is returned to B---.

It is also clear that the acetone, while a necessary carrier in the cylinder, does not serve any additional purpose to the benefit of B---'s customer.

In view of our trend to a little more liberality in the sale for resale field, and in view of the fact that the acetone actually does benefit B---'s customer to the extent that it is a necessary carrier thereof up until the time that customer will stop storing the acetylene, it is my opinion that we might properly regard the acetone as bought for resale. It would appear that the acetone is in the product sold to B---'s customer for a considerable time after transfer because the acetone must be added by B--- to enable B---'s customer to store the acetylene without the danger of explosion.

I realize that it was possibly your view in your letter of May 20, 1948, that the acetone might best be regarded as consumed as, in effect, a part of the returnable container. I am wondering whether, in view of the opinion of the State chemists that the acetone dissipates in the main when the acetylene is removed, we might modify our position that acetone is a part of the returnable container. I was wondering whether acetone is actually container material. But in any event, I believe in view of the foregoing it is not a part of the returnable container.

Perhaps you, Bill Holden and I can discuss this matter after you have read this memorandum.

The clear use of acetone as an anti-explosive is also pointed out in “The Chemistry of Acetylene” by Nieuwland, pages 2, 30, 32 and 33.

WWM:tj