

Some Observations On The Possible Role of Methyl Chloride (MeCl) in the 11/28/42 Cocoanut Grove Fire

At the request of Mr. Michael Ehrle, I have reviewed the report of Charles C. Kenney (attached) concerning the tragic 11/28/42 Cocoanut Grove disaster. Although this is unrelated to this report, I was a student residing in Boston at the time of this catastrophe.

The Kenney report postulates that methyl chloride leaks from an air conditioning compressor, which was located in an enclosed area behind a wall where the fire was reported to have begun, could have been the source of ignition of the fire.

For my analysis, I will list the pros and the cons of the methyl chloride theory.

Methyl chloride is a volatile liquid boiling at -11° Fahrenheit (atmospheric pressure), which means that it is a gas under normal conditions (60° Fahrenheit and 14.7 lbs./sq. inch pressure). The gas density is 1.8 compared to air at 1; it is almost twice as heavy as air. In a leak, it would rapidly fall to the ground and remain on the ground. Its explosive limits are between 8.1% and 17.4% in air, (it will not burn below 8.1% or above 17.4%) and it has an ignition temperature of 1170° F. and a Flash Point of -50° F. (if it comes in contact with a flame under the conditions of Flash Point measurement).

A Scenario where methyl chloride could ignite:

1) Assume the leak were high in the enclosed room and sparks were generated by the compressor or fan motors. MeCl would flow to the floor and in so doing mix with air to form an explosive mixture. The spark would ignite the air/MeCl mixture in the Compressor room. The flame would have to enter the Melody Lounge either by blowing out through cracks in the wall, or, if there was an explosion, by rupturing a portion of the wall.

2) Assume there was no spark in the compressor room. The MeCl/air explosive mixture resulting from a high leak enters the Melody Lounge through cracks in the wall and is ignited by a cigarette or match source in the Lounge.

3) Assume a low leak of MeCl where there was not enough mixing with air in the compressor room. The MeCl vapor would fall to the floor and enter the Melody Lounge through cracks in the wall near the floor. Inside the Lounge it would mix with air and

form an explosive mixture due to movement of people in the Lounge. It would be ignited by cigarettes or match flames from people in the Lounge.

4) There is a long time leak (high or low) of MeCl which stays close to the floor in the enclosed area. Over a period of time, diffusion would cause the MeCl to mix with air and form an explosive mixture. There is a spark from one of the two fan motors or the compressor motor which causes the mixture to ignite, or the mixture seeps into the Melody Lounge and is ignited.

5) Assume there was a MeCl/air fire and it burned long enough in the compressor room to ignite the room wood stud walls, this fire could have ignited the cloth, bamboo and rattan in the Lounge.

B Scenario where MeCl would not ignite.

- 1) Leaking MeCl stays in the enclosed area and there is no spark for ignition.
- 2) MeCl/air is exhausted by one or both of the two fans in the enclosed area.

C Tentative Conclusions

- 1) There were many opportunities for the MeCl to ignite and cause the fire.
- 2) If the fire was observed to begin in the Melody Lounge, explosive vapors would have to enter the Lounge from the enclosed area to ignite.
- 3) There is no obvious indication of a passageway from the enclosed area into the Melody Lounge.
- 4) If the MeCl was the ignition source, and if the fire was observed to start in the corner of the Melody Lounge closest to the Compressor Room, there is no easy path for this fire to leave the compressor room and enter the Melody Lounge.


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