Coffee Break Training - Fire Protection Series

Hazardous Materials: "Normal" Vents for Atmospheric Flammable and Combustible Liquid Tanks

No. FP-2011-9 March 1, 2011

Learning Objective: *The student shall be able to identify the requirements for normal venting for flammable and combustible liquid tanks.*

Vent devices are installed on some flammable and combustible liquid tanks to balance the pressure between the tank and atmosphere, and prevent damage when the tank is filled or emptied. These are known as "vents for normal venting" or operating vents. (Coffee Break Training 2010-42 explained the purpose of emergency vents.) Tanks that store product at ambient pressure (or that operate at less than 2.5 psig [17.2 kPa]) are known as "atmospheric" tanks. This category includes some aboveground and underground tanks.

The vent outlet for this aboveground storage tank should be located at least 12 feet (366 cm) above the adjacent ground level.

When tanks are filled, flammable and combustible vapors are expelled through the vent outlet. When an aboveground tank is warmed by the atmosphere, vapors also will escape. If vapors are heavier than air, they may accumulate on the ground and—depending upon atmospheric conditions—travel great distances where they may come into contact with an ignition source. The vent cap in today's photograph discharges downward, worsening the potential.

In order to help disperse vapors before they reach the ground, the model fire codes require that the vent pipe outlet for atmospheric tanks storing Class I, II, or III-A liquids be at least 12 feet (366 cm) above the ground. Vents must discharge upwards or horizontally. Special caps can be installed to prevent the accumulation of rainwater in the tank. Class III-B vent outlets are allowed to discharge inside a building if the vent is equipped with a device that keeps it in the normally closed position.

Vents pipes must be installed so they drain back into the tank. In the event of a tank overfill, liquid could fill the vent pipe. By draining back into the tank, the vent line should remain clear to allow vapors to escape.

Vent lines must be installed so they are protected from physical damage or vibration. Vents from multiple tanks cannot be joined (manifolded) unless part of a vapor recovery, vapor conservation, or pollution control equipment.

For additional information, refer to NFPA® 30, *Flammable and Combustible Liquids Code*, Chapter 5, *International Fire Code*®, Chapter 34, or NFPA® 1, *Uniform Fire Code*®, Chapter 66.