No. 2008-2 January 8, 2008

U.S. Fire Administration / National Fire Academy

Coffee Break Training

Topic: Flame Detector Installations

Learning objective: *The student shall be able to identify some limiting installation conditions for ultraviolet and infrared flame detection devices.*

The red item in the foreground is a combination ultraviolet and infrared flame detector focused on a flammable liquid processing assembly. These special devices often are found in high hazard and high value operations such as refineries, drilling and production platforms, fuel loading facilities, compressor stations, electrostatic and paint spray booths, liquefied petroleum gas processing and storage facilities, aircraft hangars and chemical plants. They sense invisible energy at either end of the light spectrum that is emitted in the early stages of a fire.

While these devices have special detection capabilities, they also have limitations that should be addressed during plan review, inspection, installation, and ongoing maintenance.

- These detectors may have a limited "field of view," so they must be focused on the specific hazard being protected. Some have a maximum vision cone of 120°.
- The distance at which the detector will respond to a flame is relative to the flame's intensity, so the detector must be located close to the hazard. For some devices, the maximum distance between the device and the hazard is 50 feet (15.2m).
- Detectors should be mounted so they are as free from shock and vibration as possible and convenient for visual inspection and cleaning.
- Detectors mounted in dirty atmospheric conditions require frequent inspection, cleaning, and sensitivity checking. Make sure the field-of-view of the detector is not obstructed by its cover or nearby objects.

- Detectors must be approved for the ambient temperature ranges in which they are located. For outdoor installations or other areas exposed to intense, direct solar radiation, a shade or cover may be required to keep the detector temperature within manufacturer's recommendations.
- Conditions that would allow ice buildup on the optical detector windows should be avoided.
- Detectors should be located away from sources of electrical noise where possible.
- Any *ultraviolet* detector may be triggered by other sources of electromagnetic interference, such as X-rays, sunlight, reflected sunlight, Gamma rays, lightning, arc welding, industrial lighting, or fluorescent lighting, so protecting the detector field of view from these sources is essential.