

## FIRE PROTECTION REQUIREMENTS FOR LIQUEFIED PETROLEUM GAS STORAGE AND USE

The wide range in size, arrangement, and location of Liquefied Petroleum Gas installations covered by the 1997 Uniform Fire Code precludes the inclusion of detailed fire protection provisions completely applicable to all installations. Provisions in this section are subject to verification or modification through analysis of local conditions.

The planning for effective measures for control of inadvertent Liquefied Petroleum Gas release or fire shall be coordinated with local emergency handling agencies, such as fire and police departments. Such measures require specialized knowledge and training not commonly present in the training programs of emergency handling agencies. Planning shall consider the safety of emergency personnel.

### STEP 1

Fire protection shall be provided for installations having storage containers with an aggregate water capacity of more than 4,000 gallons subject to exposure from a single fire. The method of protection shall be based upon the fire safety analysis of the following five issues:

**1. Conditions of hazard within the container site**

Conduct a thorough, competent fire safety analysis of the local conditions to identify conditions potentially contributing to an increased fire hazard.

**2. Exposure to or from other properties**

After determining the required setback distance of the Liquid Petroleum Gas Storage unit to property lines (see UFC Table 3-2.2.2), determine potential impact of fire to or from adjoining structures or uses.

**3. Water supply**

Determine the local water system level of service, hydrant locations, and flow rates. **Note:** Experience has indicated that hose stream application of water in adequate quantities as soon as possible after the initiation of flame contact is an effective way to prevent container failure from fire exposure. The majority of large containers exposed to sufficient fire to result in container failure have failed from 10 minutes to 30 minutes after the start of the fire when water was not applied. Water in the form of a spray can also be used to control un-ignited gas leakage.

**4. Probable effectiveness of onsite fire suppression capabilities**

Determine the fire fighting capabilities in place on the site. Note the following:

- Each industrial plant, distributing plant, and distributing point shall be provided with approved portable fire extinguishers per UFC Standard 10-1.
- Emergency controls shall be conspicuously marked, and the controls shall be located so as to be readily accessible in emergencies.
- Site fire brigade training and equipment.

**5. Time of response and probable effectiveness of the responding fire department or fire district**

- Determine the fire department or fire district level of service. The first consideration in a fire protection analysis shall consist of the use of water applied by hose streams by the fire department for the effective control of hazardous leakage or fire exposing storage tanks or cargo vehicles that may be present.
- Determine fire equipment access to and on the site. Suitable roadways or other means of access for emergency equipment, such as fire department apparatus, shall be provided.

## STEP 2

If the fire safety analysis, which includes the five issues stated in Step 1, indicates that a serious hazard does not exist, then onsite fire protection measures are not required.

## STEP 3

If the fire safety analysis, including the five issues in Step 1, indicates that a serious hazard exists, then the following Special Protection is required.

### Special Protection

If a serious hazard exists because the five issues in Step 1 do not allow for the suppression of the fire, then one of the following measures is required for operation of the facility:

- If applied insulated coatings are used, they shall be capable of limiting the container temperature to not over 800T (427C) for a minimum of 50 minutes, as determined by test with insulation applied to a steel plate and subjected to a test flame substantially over the area of the test plate. The insulation system shall be inherently resistant to weathering and the action of hose streams.
- If mounding is utilized, the materials shall be earth or sand and provide a minimum one foot thickness of cover and an erosion-proof cover provided for the tank.
- If burial is utilized, then the following provisions shall constitute adequate protection. ASME container assemblies listed for underground installation, including interchangeable aboveground or underground container assemblies may be installed underground per UFC Standard 82-1-3-2.3.8.
- If water spray fixed systems are used, they shall comply with NFPA 15, *Standard for Water Spray Fixed Systems for Fire Protection*. Such systems shall be automatic call actuated by fire responsive devices and also have a capability for manual actuation.
- If monitor nozzles are used, they shall be located and arranged so that all container surfaces likely to be exposed to fire will be wetted. Such systems shall otherwise comply with NFPA 15, *Standard for Water Spray Fixed Systems for Fire Protection* and shall be automatically actuated by fire responsive devices and also have a capability for manual actuation.