



U. S. Chemical Safety and Hazard Investigation Board RECOMMENDATIONS STATUS CHANGE SUMMARY

Report:	Public Safety at Oil and Gas Storage Facilities
Recommendation Number:	2011-H-1-R05
Date Issued:	September 30, 2011
Recipient:	American Petroleum Institute (API)
New Status:	Closed – Acceptable Action
Date of Status Change:	July 17, 2018

Recommendation Text:

Create a new standard or amend existing standards covering exploration and production facilities to:

- a) Warn that storage tanks at unmanned facilities may be subject to tampering or introduction of ignition sources by members of the public, which could result in a tank explosion or other accidental release to the environment.*
- b) Recommend the use [of] inherently safer storage tank design features to reduce the likelihood of explosions, including restrictions on the use of open vents for flammable hydrocarbons, flame arrestors, pressure vacuum vent valves, floating roofs, vapor recovery systems or an equivalent alternative.*
- c) Require security measures at least as protective as API 2610 to prevent nonemployee access to flammable storage tanks at upstream E&P sites, including such measures as a full fence surrounding the tank(s) with a locked gate, hatch locks on tank manways, and barriers securely attached to tank external ladders or stairways.*
- d) Require that hazard signs or placards be displayed on or near tanks to identify the fire and explosion hazards using words and symbols recognizable by the general public.*
- e) Recommend that new or revised mineral leasing agreements include security and signage requirements as described above.*

Board Status Change Decision:

A. Rationale for Recommendation

On October 31, 2009, two teenagers, aged 16 and 18, were killed when a petroleum storage tank exploded in a rural oil field in Carnes, Mississippi. Six months later a group of young adults and teenagers were exploring a similar tank site in Weleetka, Oklahoma, when an explosion and fire fatally injured one individual. Two weeks later, a 25-year-old man and a 24-year-old woman were on top of an oil tank in rural New London, Texas, when the tank exploded, killing the woman and seriously injuring the man.

In April 2010, the U.S. Chemical Safety and Investigation Board (CSB) initiated an investigation into the root causes of these tragic incidents. All three incidents involved rural unmanned oil and gas storage sites that lacked fencing and signage warning of the hazards, which might have

otherwise deterred members of the public from using them as places to gather. As a part of its investigation, the CSB identified 26 similar incidents between 1983 and 2010 which resulted in a total of 44 fatalities and 25 injuries. All of the victims were 25 years of age or less.

The CSB reviewed voluntary consensus codes and standards applicable to fire protection and security of oil storage tanks developed by the American Petroleum Institute (API). The CSB determined that API Recommended Practice 74, *Occupational Safety for Onshore Oil and Gas Production Operation*, provides safety guidance for fire prevention and protection, but does not include guidance for fencing, physical barriers, or security gates to prevent access to tank catwalks and tank hatches; hatch locking mechanisms; or specific tank explosion warning signs to prevent fatal incidents due to unauthorized entry.

API Standard 2610, *Design, Construction, Operation, Maintenance and Inspection of Terminal & Tank Facilities* (2nd ed., issued in May 2005), which is applicable only to downstream facilities that store refined petroleum products, includes security measures such as fencing, perimeter lighting, and preventing tank access in Section 13.3.6. The CSB concluded that current API industry guidance addresses specific security measures for storage tanks containing refined petroleum products, but not for storage tanks at upstream exploration and production sites. Therefore, the CSB issued the above recommendation to the API:

B. Response to the Recommendation

In December of 2017, API approved Addendum 1 to Recommended Practice 12R1, *Recommended Practice for Setting, Maintenance, Inspection, Operation, and Repair of Tanks in Production Service*, Fifth Edition, August 1997, Reaffirmed April 2008. This addendum added requirements to Subsections 4.1.1 (Setting of New or Relocated Tanks); 5.1.7 (Placement of No Smoking signs); 5.1.8 (Tanks that contain toxic or poisonous gases, such as H₂S) and a new Annex J, entitled “Unmanned Upstream Facility Design and Safety Considerations.” Annex J contains recommendations for practices when such facilities may be subject to tampering or introduction of ignition sources by members of the public that could result in a tank explosion or other accidental release to the environment and addresses all the requirements listed in the CSB Recommendation in its six subsections: (1) General public safety; (2) Facility security assessment; (3) Design considerations to mitigate vapor releases; (4) Barricades; (5) Signage; and (6) Leases.

C. Board Analysis and Decision

As Addendum 1 (which was approved in December of 2017) of API Recommended Practice 12R1, *Recommended Practice for Setting, Maintenance, Inspection, Operation, and Repair of Tanks in Production Service*, Fifth Edition, August 1997, Reaffirmed April 2008, addresses all the requirements listed in CSB Recommendation No. 2011-H-1-R05, the Board voted to change its status to: “Closed – Acceptable Action.”