



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

<b>Report:</b>	Public Safety at Oil and Gas Storage Facilities
<b>Recommendation Number:</b>	2011-H-1-R3
<b>Date Issued:</b>	September 30, 2011
<b>Recipient:</b>	Oklahoma Corporation Commission (OCC)
<b>New Status:</b>	Open – Unacceptable Response/No Response Received
<b>Date of Status Change:</b>	October 26, 2020

### Recommendation Text:

*Amend state oil and gas regulations to:*

- a) Protect storage tanks at exploration and production sites from public access by requiring sufficient security measures, such as full fencing with a locked gate, hatch locks on tank manways, and barriers securely attached to tank external ladders and stairways.*
- b) Require hazards signs or placards on or near tanks that identify the fire and explosion hazards using words and symbols recognizable by the general public.*
- c) Require the use of inherently safer tank design features such as flame arrestors, pressure vacuum vents, floating roofs, vapor recovery systems or an equivalent alternative, to prevent the ignition of a flammable atmosphere inside the tank.*

### 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 Hazard Investigation Board (CSB) initiated a safety hazard study into the causes of these tragic incidents. All three incidents involved rural unmanned oil and gas storage sites that lacked fencing and signs warning of the hazards, which might have otherwise deterred members of the public from using them as places to gather. The CSB identified 26 similar incidents between 1983 and 2010, which resulted in a total of 44 fatalities and 25 injuries as part of this safety hazard study. All of the victims were 25 years of age or less.

Specifically, at the Weleetka, Oklahoma explosion site, the CSB determined that the only site security was an unlocked iron cattle gate, approximately 4 feet high by 12 feet long, located where the dirt road intersects the main road. There was no perimeter fence. The oil storage tanks

at the site were equipped with six-inch diameter hatches, but they were not locked and there were no warning signs identifying hazards of the flammable petroleum crude oil inside the tanks. Of the 26 incidents identified by the CSB in its safety hazard study, seven (27%) occurred in the state of Oklahoma (which resulted in 12 fatalities and two injuries).

As the Oklahoma Corporation Commission (OCC) regulates oil and gas drilling and production operations under various Oklahoma statutes for various purposes<sup>1</sup>, the CSB reviewed state regulations applicable to oil storage tank sites. While the Oklahoma Energy Resources Board has taken a proactive role in the education of children about the dangers of playing around oil field equipment, the CSB noted that OCC oil and gas regulations do not: (1) require fencing around oil and gas sites that do not contain hydrogen sulfide; (2) mandate hatch locks for oil storage tanks; and (3) require inherently safer tank design features on oil storage tanks.

The CSB did note that oil storage tanks on oil and gas sites that also contain hydrogen sulfide hazards, did require perimeter fencing, hazard warning signs and protective manways on some tanks. The CSB also noted that the OCC has stronger safety measures for certain aboveground flammable storage tanks; however, these rules do not apply to oil and gas wells and their associated tanks involved in upstream exploration and production (E&P) operations. Tanks subject to the aboveground flammable storage tank regulations are required to be enclosed within a 6-foot high chain link fence, be separated from the fence by at least 10 feet, and have a gate to secure against unauthorized entry. These regulations also require "conspicuously posted" signs with the words "Warning" and "No Smoking" and grounding instructions.

The CSB concluded that the seven Oklahoma oil site incidents would have been less likely to occur if the sites were subject to the fencing and/or hazard warning regulations for aboveground flammable storage tanks, or the regulations applicable to oil and gas production sites with hydrogen sulfide hazards. Consequently, the Board issued a recommendation to the OCC to address these issues.

#### B. Response to the Recommendation

In 2013, the OCC added new security/fencing measures for commercial disposal well surface facilities [see Oklahoma Administrative Code (OAC) Section 165:10-9-3(e)(10)], but many unmanned oil storage tanks at production sites, with the exception of those that also have hydrogen sulfide hazards as noted above, still have no security/fencing requirements in OCC regulations.

The OCC in its 2013 rulemaking also now requires that signs be posted and maintained at well locations, and at principal lease entrances where more than one well is producing on a lease, to require no trespassing, no unauthorized personnel or similar language, the operator's twenty-four hour emergency telephone number, and the well, rather than the farm, name [see OAC 165:10-3-17(d)], but OCC regulations still do not require hazard warning signs or placards on our near stationary tanks. The OCC suggested to the CSB in recent correspondence that these signs are already required via existing OSHA 1910 regulations thus implying that additional OCC regulation

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<sup>1</sup> Preventing waste of oil and gas, protecting water resources, and under certain circumstances, to ensure public safety

may be unnecessary. While the CSB acknowledges that OSHA, under its hazard communication standard [see 29 CFR 1910.1200(f)(6)(ii)], requires hazard warnings on stationary tanks, the agency also notes that 29 CFR 1910.1200(f)(7) permits well sites to use “signs, placards, process sheets, batch tickets, operating procedures or other such written materials **in lieu of** [emphasis added] affixing labels to individual stationary process containers”. These alternative labeling systems commonly used by many employers often employ color codes, numerical ratings and special symbols which can convey adequate hazard warnings to trained well site employees and contractors but may not be understood by members of the general public; hence, the requirement in element (b) of the CSB recommendation for more explicit tank hazard warning signs or placards.

Finally, OCC has made no attempts to address the third element of the CSB Recommendation despite an existing industry consensus standard issued by the American Petroleum Institute<sup>2</sup> that speaks to this issue.

### C. Board Analysis and Decision

As noted above, the OCC to date has not proposed any changes to Oklahoma’s oil and gas regulations that comprehensively address the three elements listed in the CSB Recommendation, so the Board voted to change the status of CSB Recommendation No. 2011-H-1-R03 to: “Open – Unacceptable Response/No Response Received.”

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<sup>2</sup> Addendum 1 to 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