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The Ziegler Report

"Accidents are caused; accidents are not unwanted events that just happen."

Oil and Gas, Safety, and Construction

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The Hazard of Hydrocarbon Vapor Release in the Oil Field

Part One of Four: **Fire Hazards**

A too-frequent issue and hazard in the oil and gas industry is the release of hydrocarbon vapors (usually flammable) during drilling, completion, well service, production, or pipeline (storage) actions.

Hydrocarbon vapors present ignition or fire hazards (discussed in this Part One of Two); and health or oxygen deprivation hazards (discussed in another Ziegler Report in Part Two of Four). Part Three of Four will discuss American Petroleum Institute (API) Recommended Practice 99 Flash Fire Risk Assessment for the Upstream Oil and Gas Industry (First Edition, April 2014). Part Four of Four will discuss National Fire Protection Association (NFPA) 56: Standard for Fire and Explosion Prevention During Cleaning and Purging of Flammable Gas Piping Systems (2017).

The release of combustible or flammable liquids present similar hazards as do vapors but are generally more point-located. Examples would be liquid leaking from a pipe connection or valve; vapors are more mobile and directional than liquids (such as by wind movement).

The industry traditionally or historically deals with the hazard of flammable vapor released by distance, or conversely, "proximity issues."

The principle is that increasing distance between a vapor release point and potential ignition sources allows dilution to take place; wind direction is a helpful factor involving dilution and destination of vapors, etc.

As a result of planned, known, or foreseeable flammable vapor releases such as those examples described in the paragraphs above, the industry developed over the years as outlined in industry standards and practice (and as adopted in some regulations) distances, such as 100 feet as a distance from hydrocarbon releases to potential ignition sources.

For example, the American Petroleum Institute's Recommended Practice 54 (RP 54), Occupational Safety and Health for Oil and Gas Well Drilling and Servicing Operations, sets forth some distance considerations (See API RP 54, Third Edition, August 1999, Reaffirmed, March 2007, at Section 12.1.8). I refer to this minimum distance as the "100-foot Rule."

The 100-foot Rule is not always effective and demonstrates to not be reliable as people forget to read or consider the full text. It states, "a minimum of 100 ft" in the standard and "Discharges of oil and gas to the atmosphere should be to a safe area."

Photo/Todd Jordan, Occupational Safety and Health Administration

As updated in API RP 54 (Fourth Edition, February 2019), the standard now provides "A risk assessment on land locations should be performed to determine the appropriate safe location and distance from the wellbore for discharges of oil or gas to the atmosphere." This does not address other release points or distances other than a distance "from the wellbore," still an imperfect rule for the field.

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