

The Facility Siting Issue

Methods,
Tools, and
Resources

Properly Evaluate Building Risk and Facility Siting

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What is Driving Facility Siting Studies?

Large oil and gas and chemical processing facilities operate facilities where hazardous materials are processed and/or stored. These facilities include buildings with varying levels of occupancy that may be at risk from accidental releases that can cause fire and explosion damage and/or toxic chemical exposure.

The design of older facilities may have not initially considered/addressed facility siting risk and may have placed more emphasis on operability and efficiency of operations. It is not typical, for example, for an oil and gas processing facility that was built in the 1950's to have blast resistant control rooms or

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office buildings, even though these buildings may be very close to operating units processing large volume of hazardous chemicals.

A proper facility siting study considers explosion, fire, and toxicity risks to occupants of buildings. Facility siting risk considerations are required under the process hazards analysis (PHA) element of the process safety management (PSM) standard in the United States. Over 50% of the OSHA refinery national emphasis program (NEP) citations for PHAs were related to facility siting or human factors. Recognized and generally accepted good engineering practices (RAGAGEP) published by the American institute of chemical engineers (AIChE) center for chemical process safety (CCPS) and the American petroleum institute (API) provide more specific guidance on how facility siting studies should be conducted:

API Recommended Practice 752, 3rd Edition, Management of Hazards Associated with Location of Process Plant Permanent Buildings, 2009.

API Recommended Practice 753, 3rd Edition, Management of Hazards Associated with Location of Process Plant Portable Buildings, 2012.

API Recommended Practice 756, Management of Hazards Associated with Location of Process Plant Tents, 1st Edition, 2014.

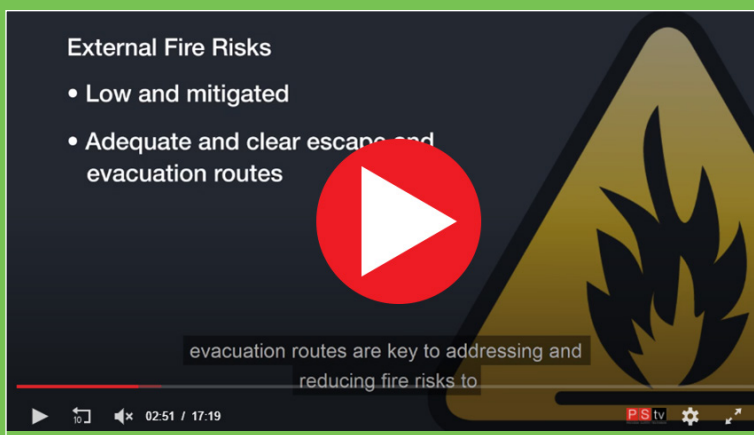
AIChE/CCPS Guidelines for Siting and Layout of Facilities, 2nd Edition, 2018.

Overview of Fire, Toxicity, and Explosion Risks

External fire risks to occupants of buildings are usually low and inherently mitigated to some degree. In general, fires that are external to buildings allow building occupants enough time to escape because the fires burn from the outside to the inside. Considerations and availability of adequate and clear escape and evacuation routes are key to addressing and reducing fire risks to building occupants.

Toxicity risks to building occupants can be high, especially if the building air handling systems are not

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PStv® White Paper Video Properly Evaluate Building Risk and Facility Siting

Watch this video to learn a systematic methodology for identifying and assessing buildings at risk and implementing cost-effective risk reduction where applicable to as low as reasonably practicable (ALARP).

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Case Study

Facility siting study is a necessary part of a QRA.

Case Study: Quantitative Risk Assessment for a Chemical Facility

A client needed to update a prior QRA study from 2015 of their plant with more equipment and buildings. OSHA 29 CFR 1910.119 PSM requires, under the PHA element, that employers conduct a facility siting study to verify that the location and occupancy of buildings, control rooms and trailers have been properly evaluated. See what elements are included in an ioMosaic QRA report, giving clients a thorough analysis of risk.

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Risk Management Made Simple

Process Safety Office® is the only integrated risk management tool that includes components to conduct facility siting studies, consequence analysis, risk analysis, pressure relief and flare systems design, PHAs, DHAs, compliance audits, and more. This tool is used by consultants, recognized as industry standards by AIChE, and distributed by DIERS. Get more information now.

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PHA/HAZOP Leader e-Learning Course

Gain a thorough understanding of the essentials of leading PHAs using industry methodologies such as HAZOP, FMEA, What If, Checklist, and more via online training and Webex® workshop.

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Incidents Related to Facility Siting

Date	Location	Fatalities	Description
2013	West, TX	15	Fertilizers, pesticides and herbicides
2006	Danvers, MA	0	Heptane and alcohols
2005	Texas City, TX	0	Heptane/hexane release
2005	Point Comfort, TX		
2002	Pascagoula, MS		
1999	Allentown, PA		
1998	Mustang, NV		
1992	La Mede, France		
1989	Pasadena, TX		
1988	Norco, LA		
1984	Mexico City, Mexico		
1978	Texas City, TX		
1974	Flixborough, UK		

PStv® Safety Moment on Facility Siting

The design of older facilities may not have fully considered facility siting risks and may have placed more emphasis on operability and efficiency of operations. Watch this video to learn how accidents can be prevented.

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