

This guidance update is intended to provide further insight into the practical aspects of undertaking an occupied building risk assessment (OBRA) in accordance with the Chemical Industries Association's (CIA's) guidance document on the location and design of occupied buildings on chemical manufacturing sites. The following highlights the more significant changes to the new guidance:

Identifying hazardous events

Further to Section 3.9 of the CIA's guidance, regarding Buncefield-type explosions (which can result from the loss of containment of materials capable of rapid vaporisation and/or air entrainment under nil-wind conditions, where a low-lying 'pancake' shaped cloud of extremely dense flammable vapour can form), a new approach is recommended. It is noted that the risk from these events can significantly skew the results of risk tolerability in the exceedance curve method. It is unlikely that many buildings would adequately safeguard occupants if approached or engulfed by a pancake cloud which subsequently ignited. This scenario should thus be included in the risk assessment, but care should be taken in the interpretation of an exceedance curve for the determination of the overpressure that a building should be designed to withstand. Additional risk reduction measures should be considered by using the risk reduction hierarchy.

Predicting impacts on temporary buildings

Section 5 of the CIA's guidance addresses temporary buildings. Current and recognised good practice is to treat all buildings equally under OBRA, regardless of temporary status. Cost benefit analysis is not an appropriate tool for the justification of the placement of temporary buildings.

Will the building resist all impacts?

Section 4, Table 4.1 of the CIA's guidance provides benchmark values below which no specific building safety measures are required; these criteria have been reviewed and no significant changes have been made. Once all accident scenarios are defined, modelling programmes can predict the impact at various distances from the initiating event. Comparing impacts at the known location for each building will indicate if further measures are needed.

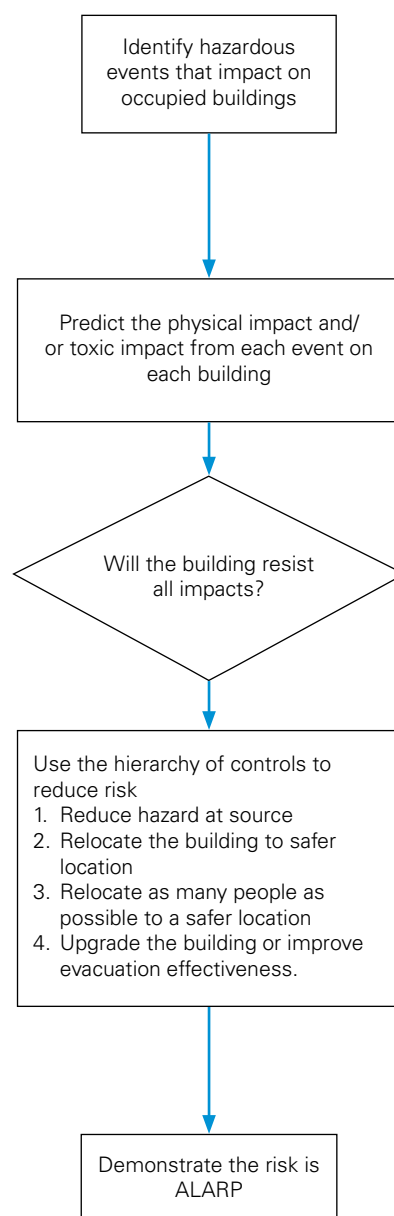
Use the hierarchy of controls to reduce risk

It is recommended to consider all methods of risk reduction in order through the hierarchy of controls before attempting to demonstrate any tolerability of risk. It may be possible to reduce hazardous material inventory or store material under inherently safer conditions, such as at lower temperatures or pressures which would significantly reduce the potential impacts of the hazardous scenarios. Operators should ask themselves why a building really needs to be within any hazardous zone and whether the people in that building really need to be there.

Demonstrate the risk is ALARP

Section 4.9 of the CIA's guidance discusses how to demonstrate risk tolerability using either a risk-based approach or an exceedance curve approach. Individual risk is used to determine the tolerability to building occupants in the normal way, whilst aggregate risk is used to determine prioritisation of additional risk reduction measures. Examination of the exceedance curve can provide additional insight into which hazard scenarios are contributing most to the risk and thereby indicate priority scenarios to reduce at source. This information should feed into a site's action plan for future risk reduction. Even if risks are shown to be broadly acceptable, a final risk reduction review should be carried out to assess if there are any opportunities for adopting additional low-cost risk reduction solutions.

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Useful additional information:

https://www.icheme.org/~media/Documents/Subject%20Groups/Safety_Loss_Prevention/Hazards%20Archive/XXII/XXII-Paper05.pdf

HSE Guidance RR1113, 2017.

FABIG Technical Note 12 Atkinson and Pursell, 2013.



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