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Chemical Industries Association Occupied Building Risk Assessment Factsheet 2020

CIA Chemical Industries Association

Working for chemical and pharmaceutical businesses

This factsheet is intended to help managers of high hazard sites understand their duties with respect to risks of the location and design of occupied buildings on chemical manufacturing sites.

What is an Occupied Building Risk Assessment (OBRA)?

An OBRA is a risk assessment which assesses the hazards imposed on a building's occupants in the event of a major accident. Both the location and the design of occupied buildings can significantly affect the survivability of people occupying them in the event of a major accident. An OBRA can help determine if the occupants of a building are being subjected to unnecessary risk and identifies where additional protection would be advised. Undertaking an OBRA study makes it possible to identify what actions to take to limit the consequences of any potential major accidents and to demonstrate that the risks are as low as reasonably practicable (ALARP).

Why should you do an Occupied Building Risk Assessment?

The requirement to carry out an OBRA comes from various legislation. For sites subject to the Control of Major Accident Hazards Regulations 2015 (COMAH), Regulation 5(1) places a general obligation on all COMAH operators to take 'all measures necessary' to prevent major accidents and to limit their consequences for human health and the environment. In other legislation, Section 2(2) of the Health and Safety at Work etc Act 1974, combined with Section 3(1) of the Management of Health and Safety at Work Regulations 1999 and Section 9(2) of The Regulatory Reform (Fire Safety) Order 2005 lay down the general obligations on all site management to demonstrate associated risks are ALARP. HSE's L111 Guidance on COMAH advises that consequences of MAHs on occupied buildings should be considered and technical Criteria 10.3 and 10.4.1 of the COMAH SRAM 2015 Predictive Criteria[1], indicate that the Competent Authority would expect to find the results of calculations showing suitable estimates of the severity and extent of the consequences of each major accident on populations, including those in occupied buildings, within a Safety Report. This CIA guidance is referenced in the SRAM. The safety report should provide details to demonstrate that suitable and sufficient consequence assessment for each major accident scenario has been carried out with respect to people, it should draw conclusions about the tolerability of risks from the site and come to conclusions about what further risk reduction options are reasonably practicable.

A formal OBRA can help demonstrate compliance with these requirements and is considered to be a form of recognised good practice expected by the Regulator whether or not sites fall within the COMAH regime. Without undertaking an OBRA, it is difficult to demonstrate that risks to personnel accommodated on or around a site with major hazard potential are as low as reasonably practicable (ALARP).

How do you do and use an Occupied Building Risk Assessment?

There are a number of qualitative and semi-quantitative ways to carry out an OBRA depending on the size of hazards and risks associated with the site. However, it is generally accepted that the level of rigour of such an assessment should be proportionate to the potential risks imposed by the site.

Where semi-quantitative methodology is applied, the following steps are required:

- the identification of major accident hazard scenarios that could affect occupied buildings
- the determination of the level of severity that each of these scenarios could impose upon an occupied building
- an estimation of the frequency at which each scenario could be expected to occur.

This information is then used to estimate a 'tolerability of risk' based on individual risk principles against industry-recognized criteria (e.g. HSE's guidance document 'Reducing Risks, Protecting People'[2]). Qualitative tools may also be employed alongside such an assessment, which look at the building with regard to, for example, emergency response or provisions for temporary shelter.

The main output of any assessment is to ensure the risk is ALARP[3]. This can be achieved through the consideration of further risk reduction measures against a hierarchy of control. The use of such a hierarchy should focus on the reduction of the risk at source (i.e. inherent safety) before looking to provide structural reinforcement of buildings (i.e. mitigation).

The CIA's guidance document 'Guidance for the location and design of occupied buildings on chemical manufacturing and similar major hazard sites'[4] explains how to make this demonstration using either a simple risk approach or an exceedance curve approach. The analysis helps you understand which accident scenarios contribute most to the risk of people inside each building and can help you prioritise where to spend your efforts reducing risk for maximum effect.

How long does an Occupied Building Risk Assessment take and what does it cost?

It depends on your site complexity, how many major accident scenarios you have, how experienced you are in undertaking OBRA studies and whether you have the supporting information you need from the predictive assessments before you start. It is possible to undertake OBRA assessments in house if a competent assessor is available, but specialist consultancies also provide OBRA assessment services.

Where to find help with undertaking an Occupied Building Risk Assessment.

CIA's guidance document 'Guidance for the location and design of occupied buildings on chemical manufacturing and similar major hazard sites'[4] is accepted industry best practice guidance on undertaking OBRA studies and will guide assessors through the steps needed to demonstrate that risk to building occupants is as low as reasonably practicable.

1 http://www.hse.gov.uk/comah/sram/docs/s10.pdf
2 http://www.hse.gov.uk/risk/theory/r2p2.htm
3 http://www.hse.gov.uk/risk/theory/alarpglance.htm
4 http://bit.ly/OccupiedBuildings-guide

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