

Title	Research Report 25: Application of QRA in operational safety issues																
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Executive Summary	<p>The Control of Major Accident Hazards Regulations (1999), or COMAH, came into force in Great Britain in April 1999. The general duty under COMAH regulation 4, requires that every operator shall take all measures necessary to prevent major accidents and limit their consequences to persons and the environment. This general duty is consistent with the wellknown principle in the UK of reducing risks to a level that is ‘as low as reasonably practicable’ (ALARP).</p> <p>This study has performed research into the use of risk assessment in HSE's operational decisions in the context of the COMAH regulation 4. The research focussed on the use of regulatory guidance, risk matrices and QRA to demonstrate compliance with the ALARP principle, as these methods have been widely used by operators to demonstrate compliance with the ALARP principle in COMAH Safety Reports. Each approach has its strengths and weaknesses.</p> <p>Comparison of the prevention, control and mitigation measures in place at an installation with those set out in a regulatory guidance document provides an indirect assessment of risk that gives some indication as to whether a minimum standard has been achieved. In order to demonstrate that risks are ALARP it will normally be necessary to provide some limited risk assessment.</p> <p>Risk matrices can be used to provide a ranking of risks so that the operator can identify the Safety Critical Events (SCEs), which may then constitute a ‘representative set’, and to identify those situations where the risks are definitely intolerable. The SCEs are then considered further so that risk reduction measures can be identified and prioritised.</p> <p>The outputs from a QRA can be used to compare the risks directly with the published risk thresholds defined by the ALARP principle. Additionally it can identify those events within the analysis which contribute most to the risk at any particular location or to any particular group of people. QRA can be linked with Cost Benefit Analysis (CBA) to determine whether risk reduction measures should be implemented in order to demonstrate compliance with the ALARP principle.</p> <p>CBA encapsulates a series of complex and controversial issues such as the value of a human life and the true business cost of a major accident. Such issues have to date prevented the widespread use of CBA explicitly as part of an ALARP demonstration. It is shown in this report that CBA is a potentially powerful tool for determining whether risk reduction measures are necessary at an installation. Therefore it is recommended that future work should address these sensitive issues in CBA to determine whether a consistent approach that is acceptable to both the public and industry can be developed.</p>																
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