

## Fire Engineering Design

### Risk Assessment (QRA) >

Fire safety risk assessment techniques range significantly, dependant on the level of detail required and the outcome sought. More common risk assessments may use a combination of codes & guidance and engineering judgement to determine compliance, while more complex techniques would use a ranking procedure to qualify the level of fire risk.

The definitive and most robust method of risk assessment uses numerical analysis. The approach is termed Quantified Risk Assessment. It is based on the use of statistical data, fault & event trees and deterministic analysis, such as smoke modelling, egress analysis and structural fire analysis.

#### Aims >

>Provide safe, functional, aesthetic and cost effective building design.

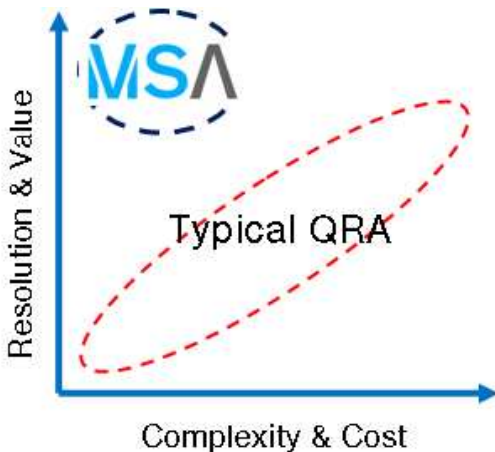
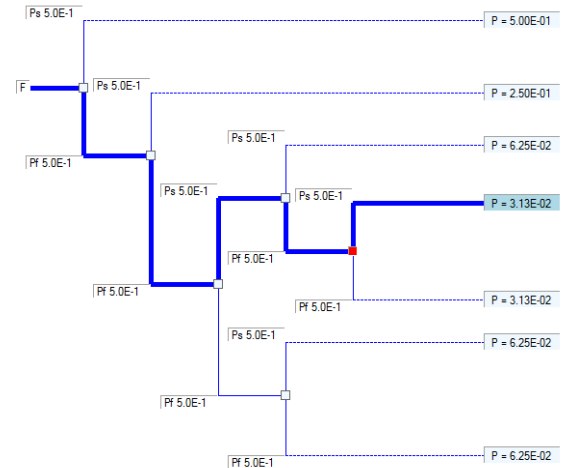
#### Benefits >

>Combines all common fire safety measures into one assessment methodology including life safety and business protection.

>Fire safety mitigation measures, for example; sprinklers, smoke control, compartmentation and the number of evacuation exits can be fairly compared and evaluated against one another. In this way the most cost effective solutions can be chosen and overdesign avoided.

>Avoids single point-failure fire strategies.

>QRA facilitates design-decision making, where alternative solutions can be robustly chosen based on their risk level and cost-benefit performance.



At MSA we are spearheading cost-effective QRA techniques which are providing both accurate and high value results to improve building design.

#### Tools >

>The approach integrates the likelihood of fire with many potential outcomes. Event trees are used to describe a range of outcomes, from the most optimistic to very severe events such as flashover, fire spread and structural failure.

>Deterministic models are then used to calculate the hazard associated with each outcome, both in terms of occupants affected and monetary loss.

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