QRA - Quantitative Risk Assessment

WHAT IS A QRA?

Quantitative Risk Assessment (QRA) is a systematic technique that is used to estimate the cumulative likelihood of the consequences of hazards associated with a plant, facility or operation.

WHAT IS A QRA USED FOR?

QRAs provide numerical estimates of risk. These assist in understanding the risk profile of the system being analysed. Potential improvements can then be easily identified and ranked for risk-reduction effectiveness. The types of risk that may be considered include safety risk, environmental risk and business / operational risk. QRA is an effective tool for ranking the hazards and comparing the risk profile for various design or operational options.

WHAT ARE THE OUTCOMES?

The results of a QRA are a range of numerical estimates of risk exposure. These can be used to identify the events that are the major risk contributors to the system being analysed. Measures of risk that may be used include:

- Individual Risk contours (incl. fatality, injury etc.)
- Societal Risk: F-N curve, Potential Loss of Life (PLL)
- Individual Risk per Annum
- Annualised loss expectancy

QRA METHODOLOGY

Hazard Identification

Identify credible hazard scenarios, considering:

- Materials present
- Activities undertaken
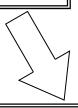- Internal & external threats etc.

Consequence Assessment

The impacts of the scenarios are assessed to determine the potential consequences.

Frequency Assessment

The likelihood of each scenario is estimated.

Risk Assessment

The risk profile is determined by combining the frequency and consequence estimates for the hazardous scenarios. The results of the analysis are then compared to the risk tolerability criteria to evaluate the tolerability of the overall risk profile.

The results can also then be reviewed to identify potential risk reduction options