

## Bow-tie Analysis for Major Hazard Evaluation

### YOUR CHALLENGE

Your goal is 'zero' fatalities or serious injuries for your operations, however there are increasing challenges in meeting that goal, such as:

- New technologies and increased process sophistication
- Loss of experienced personnel
- Overloading of current resources

OHS legislation and improved industry standards require operators of hazardous industrial facilities to rigorously identify, assess and manage major hazards. This can be a very resource intensive and time consuming task. You will want to ensure you extract maximum value from the overall risk management process.



### WHY BOW-TIE ANALYSIS?

A key part of any sound risk management process is the awareness and understanding of the key risk management controls, i.e. the controls that reduce the risk from major hazards to an acceptable level.

R4Risk's bow-tie analysis process can be effectively used to develop a risk-based platform for the ongoing management and prevention of major incidents. It delivers the following benefits:

- Draws on the direct involvement and experience of facility personnel to identify hazards and to properly incorporate critical controls into management systems
- Enables risk-based monitoring, auditing and review of critical risk controls
- Raises awareness and improves understanding and knowledge amongst employees of the potential major incidents and the reliance on critical controls that prevent those incidents from occurring
- Enables proper risk management to be demonstrated
- Contributes to achieving legislative compliance.

### KEY FEATURES

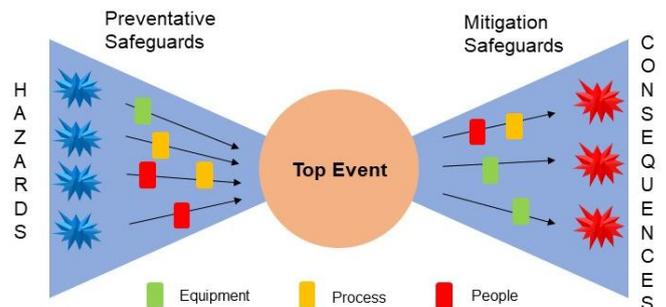
Bow-tie analysis is the ideal process for understanding the dynamics of potential major incidents.

Key features of a bow-tie analysis are:

- Risk-based screening to identify major incidents
- Clear identification of the causes of hazards
- Customised control measure selection process using a layers of protection analysis (LOPA) approach
- Identification and assessment of risk reduction measures
- Scenario risk assessment using a qualitative or semi-quantitative approach
- Outputs include bow-tie diagrams and overall site risk profile.

### CONTROL MEASURE ADEQUACY

Control measures identified during the bow-tie analysis are subjected to a customised assessment of adequacy. The adequacy assessment provides a basis for performance monitoring of the controls and the selection of appropriate key performance indicators (KPIs) to ensure that control effectiveness is maintained.



### ONGOING RISK MANAGEMENT

A bow-tie analysis provides the framework for ongoing risk management of major incidents through:

- A live risk register
- Communication of risk issues
- Monitoring of control effectiveness
- Reporting and monitoring of significant risk issues
- Action tracking and reporting
- Scenario based auditing.