BowTie Plugins
customized barrier solutions

Customized barrier solutions

CGE delivers 'off the shelf' barrier based risk management software. For most users, a default installation meets their requirements. However, the standard functionality can be extended to do even more, by using BowTieXP plugins installed on top of the existing software.
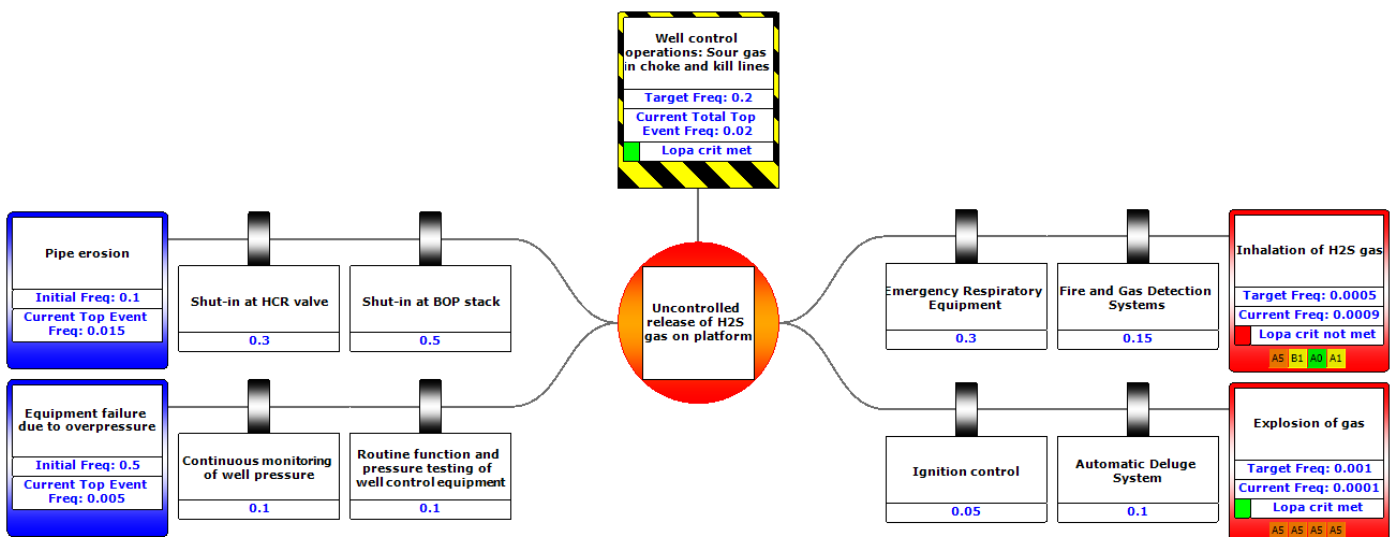
Quantitative & qualitative data

Bowtie diagrams give a better understanding of your risk scenarios and show how these are controlled. In classic bowtie modeling, the decision as to whether there are sufficient effective barriers to control these scenarios, is based on expert judgment.

When your organization has reliable and sufficient safety data available, the LOPA plugin will allow you to use this data to make more objective and substantiated decisions.

Bowtie-based LOPA

Layers of Protection Analysis (LOPA) is a semi-quantitative risk analysis methodology. Hereby the frequency of a negative event is calculated according to the risk reduction delivered by the independent protection layers (barriers). The BowTieXP LOPA plug-in automatically calculates the frequency of a consequence, given the initial frequency of all the threats and the Probability of Failure on Demand (PFD) of the barriers. This allows you to easily compare the target consequence frequency with the reality of daily operations.

Well control operations: Sour gas in choke and kill lines
Target Freq: 0.2
Current Total Top Event Freq: 0.02
Lopa crit met

Pipe erosion
Initial Freq: 0.1
Current Top Event Freq: 0.015

Shut-in at HCR valve — 0.3

Shut-in at BOP stack — 0.5

Equipment failure due to overpressure
Initial Freq: 0.5
Current Top Event Freq: 0.005

Continuous monitoring of well pressure — 0.1

Routine function and pressure testing of well control equipment — 0.1

Uncontrolled release of H2S gas on platform

Emergency Respiratory Equipment — 0.3

Fire and Gas Detection Systems — 0.15

Inhalation of H2S gas
Target Freq: 0.0005
Current Freq: 0.0009
Lopa crit not met
A5 B1 A0 A1

Ignition control — 0.05

Automatic Deluge System — 0.1

Explosion of gas
Target Freq: 0.001
Current Freq: 0.0001
Lopa crit met
A5 A5 A5 A5

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Use BowTie Plugins to:

CGE

Visualize your LOPA calculations
Traditional LOPA calculations are often performed in spreadsheets. The LOPA plugin makes the LOPA study visual and therefore easier to understand and communicate.

Consider multiple scenarios
Make your LOPA calculations more realistic by taking into account all bowtie scenarios when calculating the frequency of the top event.

Calculate future frequencies
Frequencies and/or probabilities could change over time. The LOPA plug-in allows you to calculate both current and future frequencies.

Create insightful reports
Analyze and share your LOPA calculations by creating useful reports. Some reports will be based on a single scenario (traditional) LOPA calculation, while others will take all bowtie scenarios into account.

Take the next step
Make your risk calculations visible with the LOPA plug-in and put them in an easy to understand, barrier based perspective. This plug-in can be added to both BowTieXP Standard and Advanced.

BowTie
XP
visual risk assessment

Contact CGE for a trial license or online demonstration.

ydrocarbons during well testing

Target Freq: 0.02

Current Total Top Event Freq: 0.019

Target Freq Met Currently: Lopa crit met

Target Freq Met in Future: Lopa crit not met

Uncontrolled release of hydrocarbons at surface from test equipment

a Calculations

arget Freq
Current Total Top Event Freq
Target Freq Met Currently
Future Total Top Event Freq
Target Freq Met in Future

0.02
0.019
Lopa crit met
0.035
Lopa crit not met

CGE
Risk Management Solutions
Making risk understandable

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