

Risk Assessment Matrix

Consequence Scale:

Shell Matrix

1	Slight injury
2	Minor injury
3	Major injury
4	1 to 3 fatalities
5	More than 3 fatalities



AS2885 Matrix

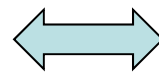
Trivial	Minimal impact
Minor	Injuries requiring 1 st aid
Severe	Injury requiring hospital treatment
Major	Few fatalities
Catastrophic	Multiple fatalities

Risk Assessment Matrix

Likelihood Scale:

Shell Matrix

A	Highly unlikely - never heard of in the industry
B	Heard of in the industry
C	Has happened in UIE* (or more than once per year in the industry)
D	Has happened at the location (or more than once per year in UIE*)
E	Frequent - has happened more than once per year in the location



AS2885 Matrix

Hypothetical	Theoretically possible but has never occurred on a similar pipeline
Remote	Not anticipated for this pipeline at this location
Unlikely	Unlikely to occur within the life of the pipeline, but possible
Occasional	May occur occasionally in the life of the pipeline
Frequent	Expected to occur once a year or more

*UIE= Upstream International Europe

Overall Risk Assessment Matrix

AS2885 Matrix Comparison

	Catastrophic	Major	Severe	Minor	Trivial
Frequent	Extreme	Extreme	High	Intermediate	Low
Occasional	Extreme	High	Intermediate	Low	Low
Unlikely	High	High	Intermediate	Low	Negligible
Remote	High	Intermediate	Low	Negligible	Negligible
Hypothetical	Intermediate	Low	Negligible	Negligible	Negligible

Overall Risk Assessment Matrix Comparison

Shell Matrix

		5	4	3	2	1
		More than 3 fatalities	1 to 3 fatalities	Major injury	Minor injury	Slight injury
E	Frequent					
D	Has happened at location					
C	Has happened in UIE					
B	Heard of in industry					
A	Highly unlikely					

Overall Risk Assessment Matrix Comparison

Shell Matrix vs AS2885

		5	4	3	2	1
		More than 3 fatalities	1 to 3 fatalities	Major injury	Minor injury	Slight injury
E	Frequent	Extreme	Extreme	High	Intermediate	Low
D	Has happened at location	Extreme	High	Intermediate	Low	Low
C	Has happened in UIE	High	High	Intermediate	Low	Negligible
B	Heard of in industry	High	Intermediate	Low	Negligible	Negligible
A	Highly unlikely	Intermediate	Low	Negligible	Negligible	Negligible

Overall Risk Assessment Matrix Comparison

AS2885

	Catastrophic	Major	Severe	Minor	Trivial
Frequent	Extreme	Extreme	High	Intermediate	Low
Occasional	Extreme	High	Intermediate	Low	Low
Unlikely	High	High	Intermediate	Low	Negligible
Remote	High	Intermediate	Low	Negligible	Negligible
Hypothetical	Intermediate	Low	Negligible	Negligible	Negligible

Potential Risk

Shell Matrix

		5	4	3	2	1
		More than 3 fatalities	1 to 3 fatalities	Major injury	Minor injury	Slight injury
E	Frequent					1
D	Has happened at location		2	2	1	1
C	Has happened in UIE	3	9	7	4	
B	Heard of in industry	1	5	6	1	
A	Highly unlikely	1		1		

Potential Risk

AS2885

	Catastrophic	Major	Severe	Minor	Trivial
Frequent					1
Occasional		2	2	1	1
Unlikely	3	9	7	4	
Remote	1	5	6	1	
Hypothetical	1		1		

Risk Treatment Actions

Shell Matrix

		5	4	3	2	1
		More than 3 fatalities	1 to 3 fatalities	Major injury	Minor injury	Small injury
E	Frequent					1
D	Has happened at location		2	2	1	1
C	Has happened in UIE	3	9	7	4	
B	Heard of in industry	1	5	6	1	
A	Highly unlikely	1		1		

Identify & implement controls to reduce risk to ALARP and provide a documented demonstration of ALARP

Identify & implement controls to reduce risk to As Low As Reasonably Practicable (ALARP)

Manage for continuous improvement through effective implementation of the Safety Management System (SMS)

Risk Treatment Actions

AS2885

	Catastrophic	Major	Severe	Minor	Trivial
Frequent					1
Occasional		2	2	1	1
Unlikely	3	9	7	4	
Remote	1	5	6	1	
Hypothetical	1		1		

Reduce risk to intermediate or lower

If possible:

- Quantify risk
- Reduce risk to low or negligible; otherwise
- Demonstrate ALARP.

Determine management plan for prevention and monitoring for changes (i.e. SMS)

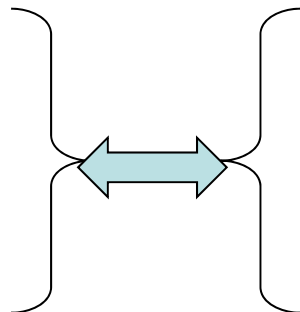
Review at next review interval

Risk Treatment Comparison

Shell

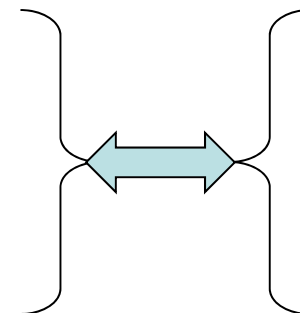
AS2885

- Reduce risks to ALARP = 31



- Reduce risks to intermediate or lower = 15
- Reduce to low or demonstrate ALARP = 15

- Manage via SMS = 14



- Determine SMS = 13
- Review next time = 2