

# **Risk Management: Panacea or Snake Oil**

**If Risk Mgt is so effective why do  
Major Accident Events still happen?**

# AGENDA

- Risk Mgt Introduction
  - Why Manage Risk
  - What is Risk
  - How is Risk Managed
  - Major Accident Events
- Bow Tie Application
- Conclusions

# **Risk Mgt Introduction**

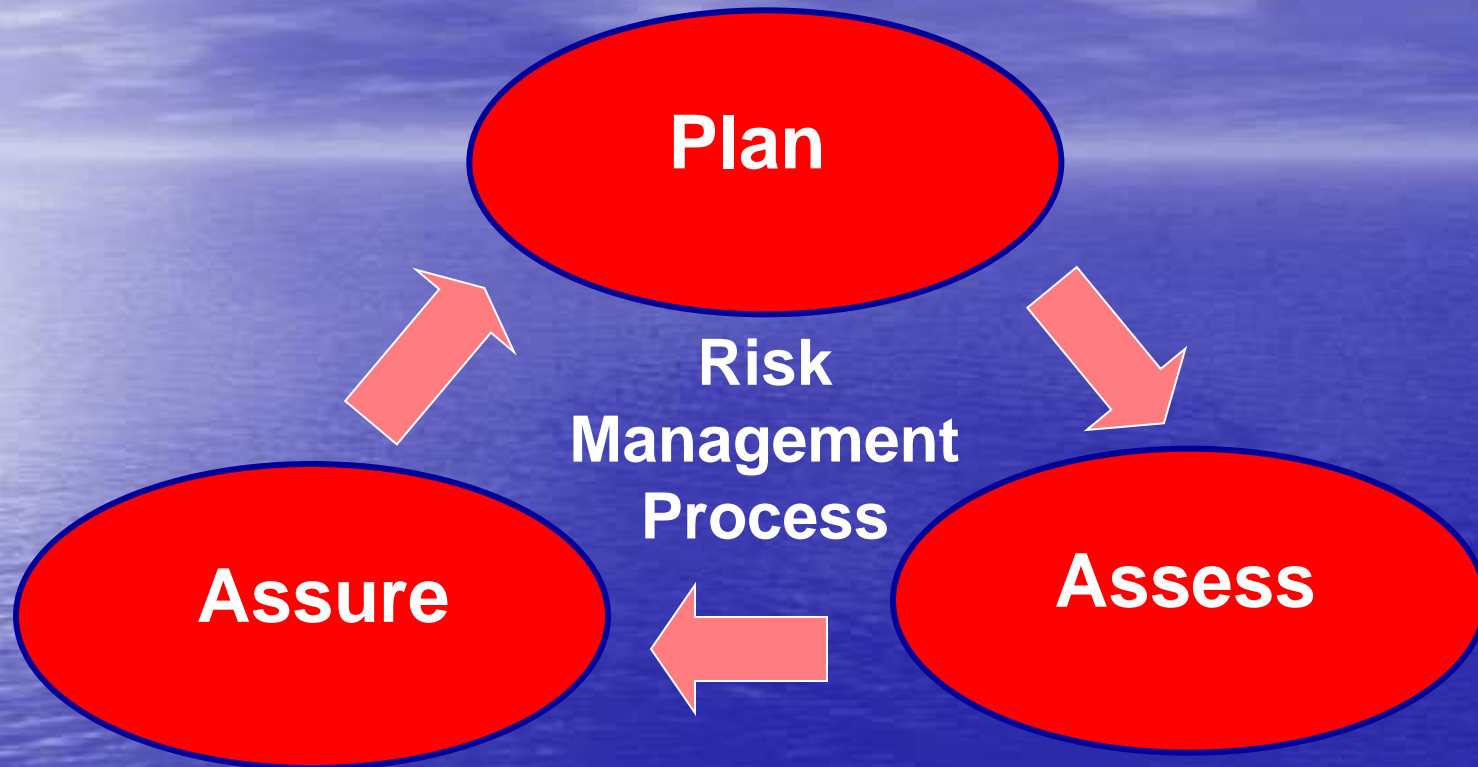


# Why Manage Risk

- Greater chance of Business Targets being met
- More effective management of strategy, tactics and investment
- Regulatory Compliance
- Corporate Governance
- Improve Operability / Reliability / Availability
- Improve Occupational Safety
- Prevention of Major Accidents which impact
  - People
  - Environment
  - Relationship with Regulators (License to Operate / Fines)
  - Reputation – external & internal stakeholders
  - Shareholder Involvement
  - Access to Funds / Investment



# Risk Management Process



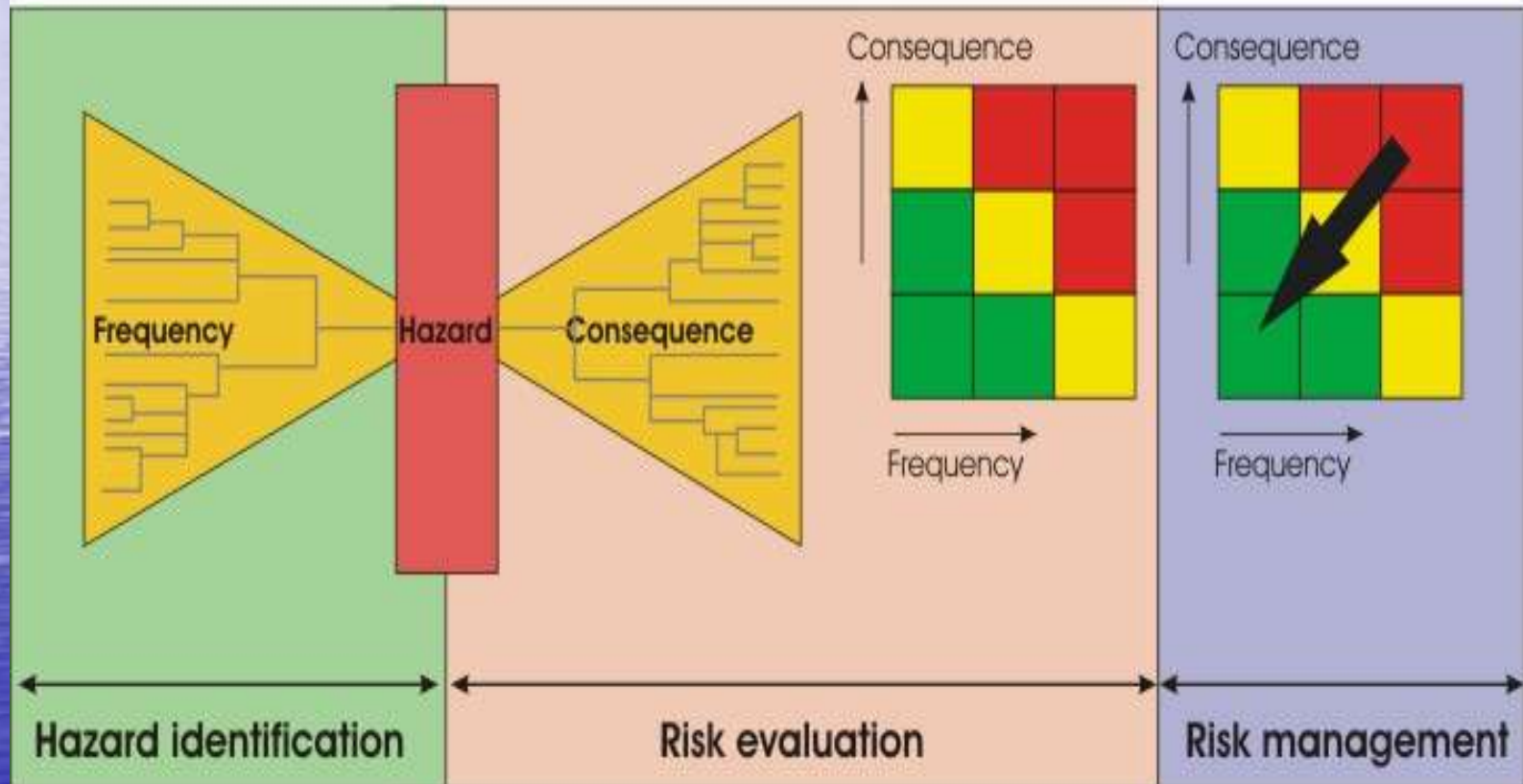
**Plan:** Development (and implementation) of a project specific or annual Risk Management plan to identify what assessments are required, when they should be undertaken and who is responsible.

**Assess:** Assess risks, determine if they are acceptable by comparing against tolerability criteria then if they are not, take action to reduce the risk to acceptable levels

**Assure:** Monitor, review, audit and document the process to provide assurance that the actions have been implemented.

# Assess Risk

RISK POSED BY A HAZARD = FREQUENCY \* CONSEQUENCE





# **RISK MGT NOT JUST ABOUT “DOING SUMS”**

**Effective Risk Mgt takes place in  
the context of Effective  
IMPLEMENTATION of Mgt  
Systems**

# Typical Mgt System Elements

## MULTIPLE BARRIERS

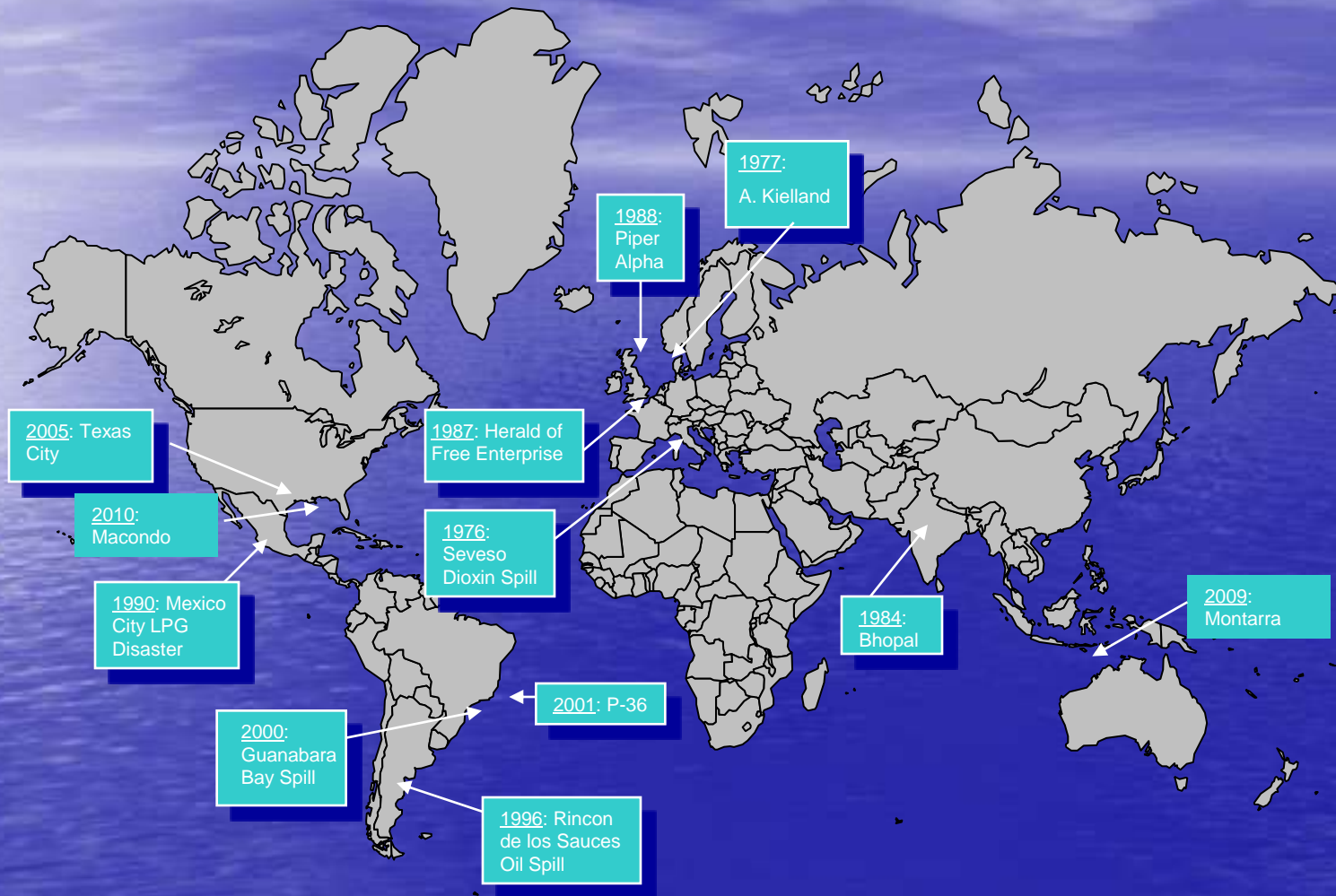
- Leadership / Commitment / Organisation
- Communication
- Risk Management
- Mgt of Change
- Regulatory compliance
- Competency
- Contractor Mgt
- Design, Ops & Maintenance controls
- Emergency preparedness
- Incident reporting & Investigation
- Documentation control
- Review & Monitoring
- Audit



# Focus on Major Accident Events

- Everybody “does” risk mgt
  - Private Life (e.g. Driving / Cycling)
  - Commercial (e.g. investment decisions)
  - Occupational Safety (e.g. Hazard Spotting)
- Focus on one aspect - Mgt of Major Accident Events arising from Major Accident Hazards (MAH)
- MAH is defined as a hazard with the potential to result in:
  - Multiple fatalities
  - Major Environmental damage
  - Substantial Loss of Asset / Plant Downtime
  - Major Reputational Impact

# Some Major Accidents in Recent Years



# MAE Characteristics

- Simple Initiating Event
- Multiple Barrier Failure
  - Non Robust Barriers
  - Common Mode failure – a single failure takes out multiple barriers

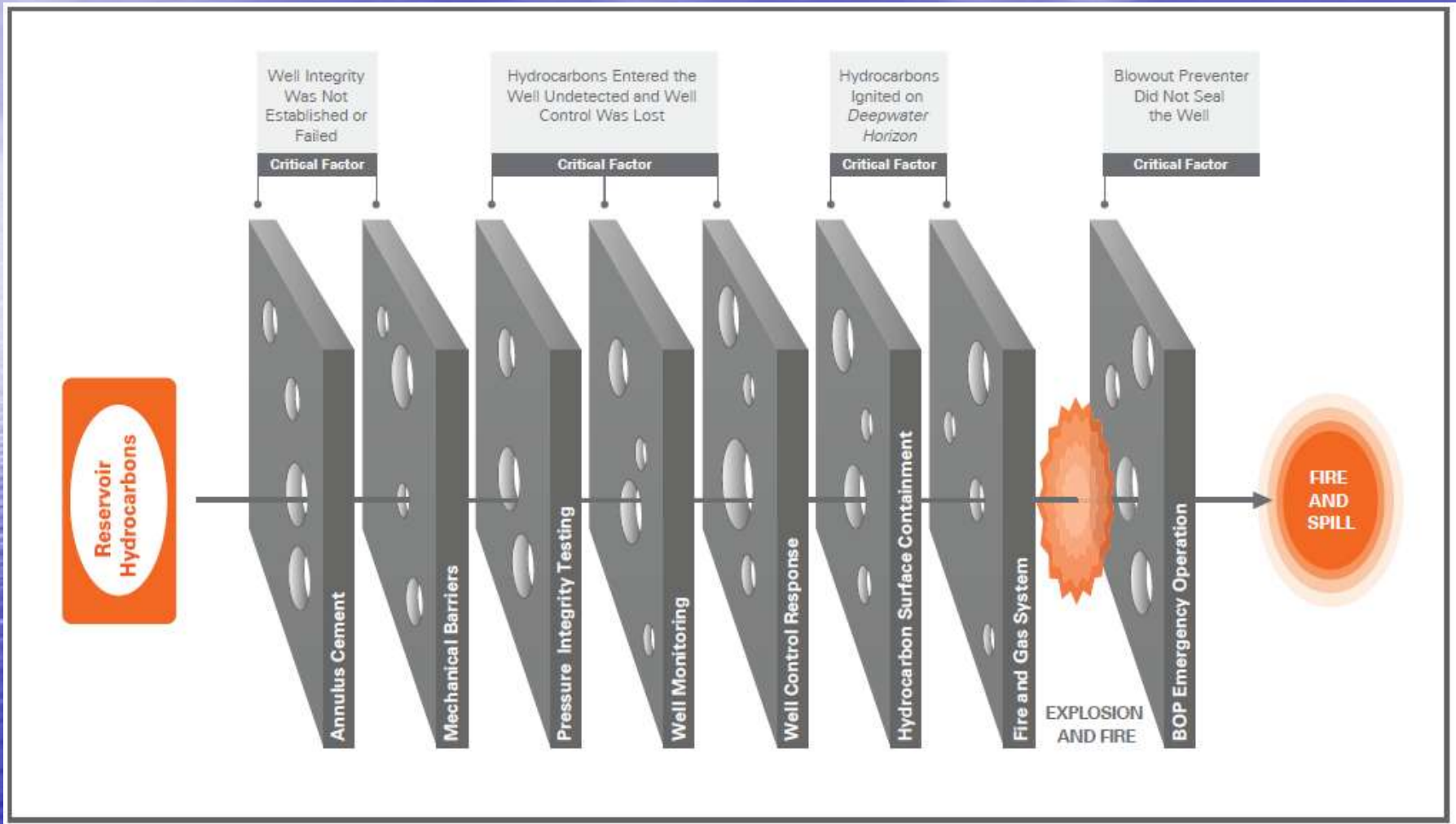
## ***THERE BUT FOR FORTUNE***

- Complacency - Occupational Safety performance is **NOT ALWAYS** an effective predictor of MAE

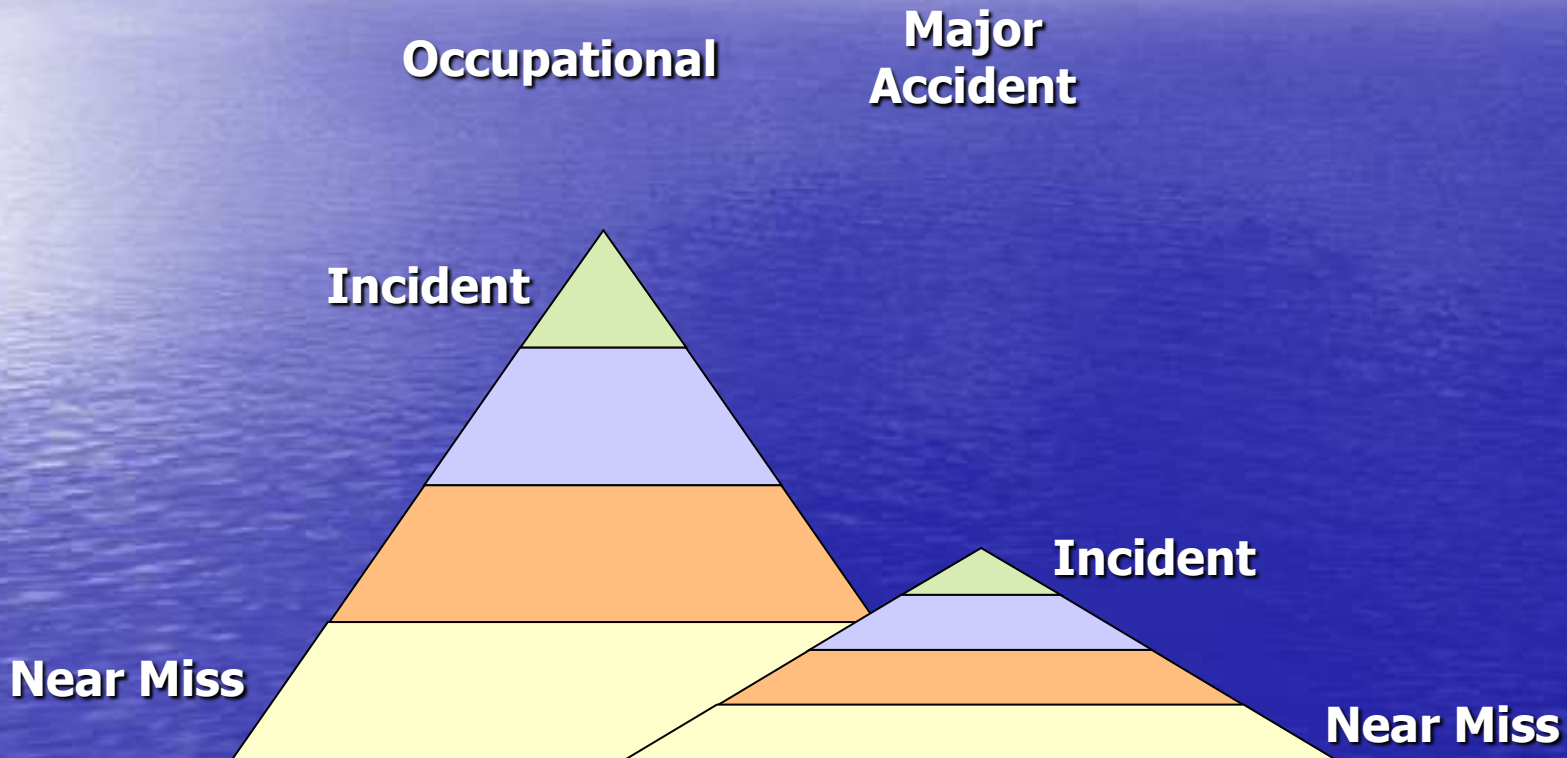


# Multiple Barrier Failure

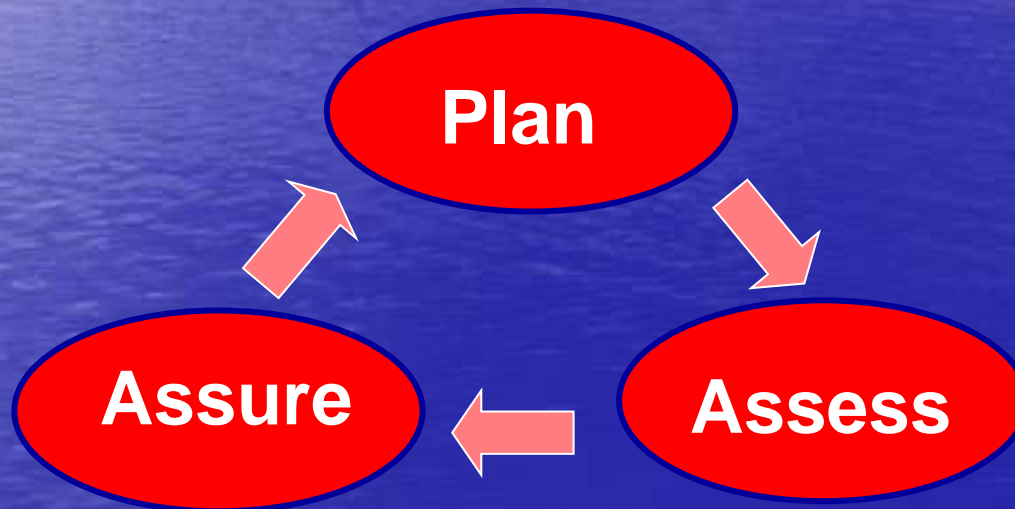
(Extract from BP Deepwater Horizon Accident Investigation Report)



# Two Populations?



# Bow Tie Application





# Effective Risk Mgt Plan

- Develop and **Implement** a risk based HSE Mgt System
- **Carry out** Focussed Risk Assessments at key stages of the business life cycle, **Understand** their output and **Implement** recommendations
- Use Risk Assessment to drive an **Assurance Process** to deliver effective operation
- **Develop** pragmatic leading indicators of MAH performance

# Application of Bow Ties

- Various Risk Mgt applications
- Concentrate of their value in:
  - Facilitating the Planning and Understanding of Risk Assessments
  - Driving Assurance processes
  - Supporting Delivery of leading MAH indicators

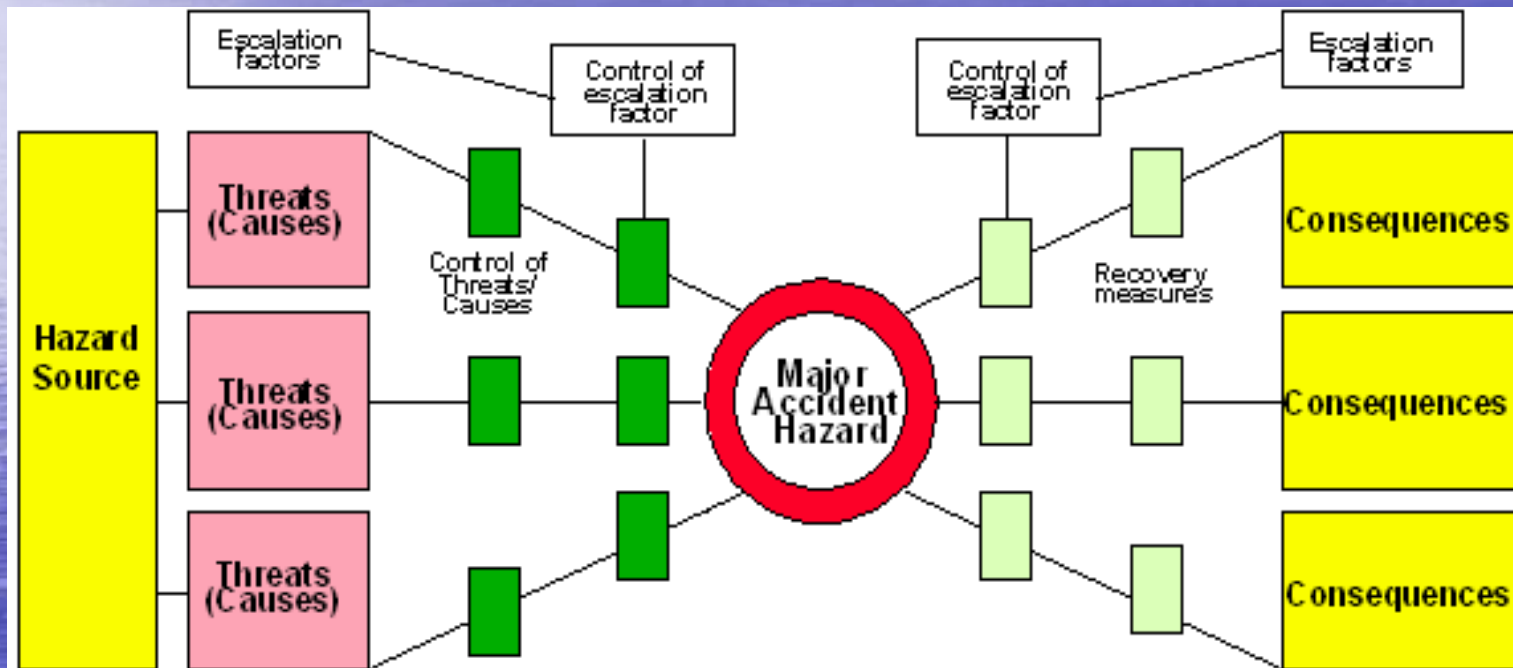
# Use of Bow Ties

A Bow Tie diagram is a pictorial representation of both the actions (or lack of them) that can result in a MAH and the multiple barriers (hard & soft) in place to minimise the risk. It depicts various measures, systems and / or factors which:

- Prevent occurrence of a MAH
- Control / minimize the hazard
- Lead to escalation of the hazard
- Minimize the consequential impacts of a hazard.

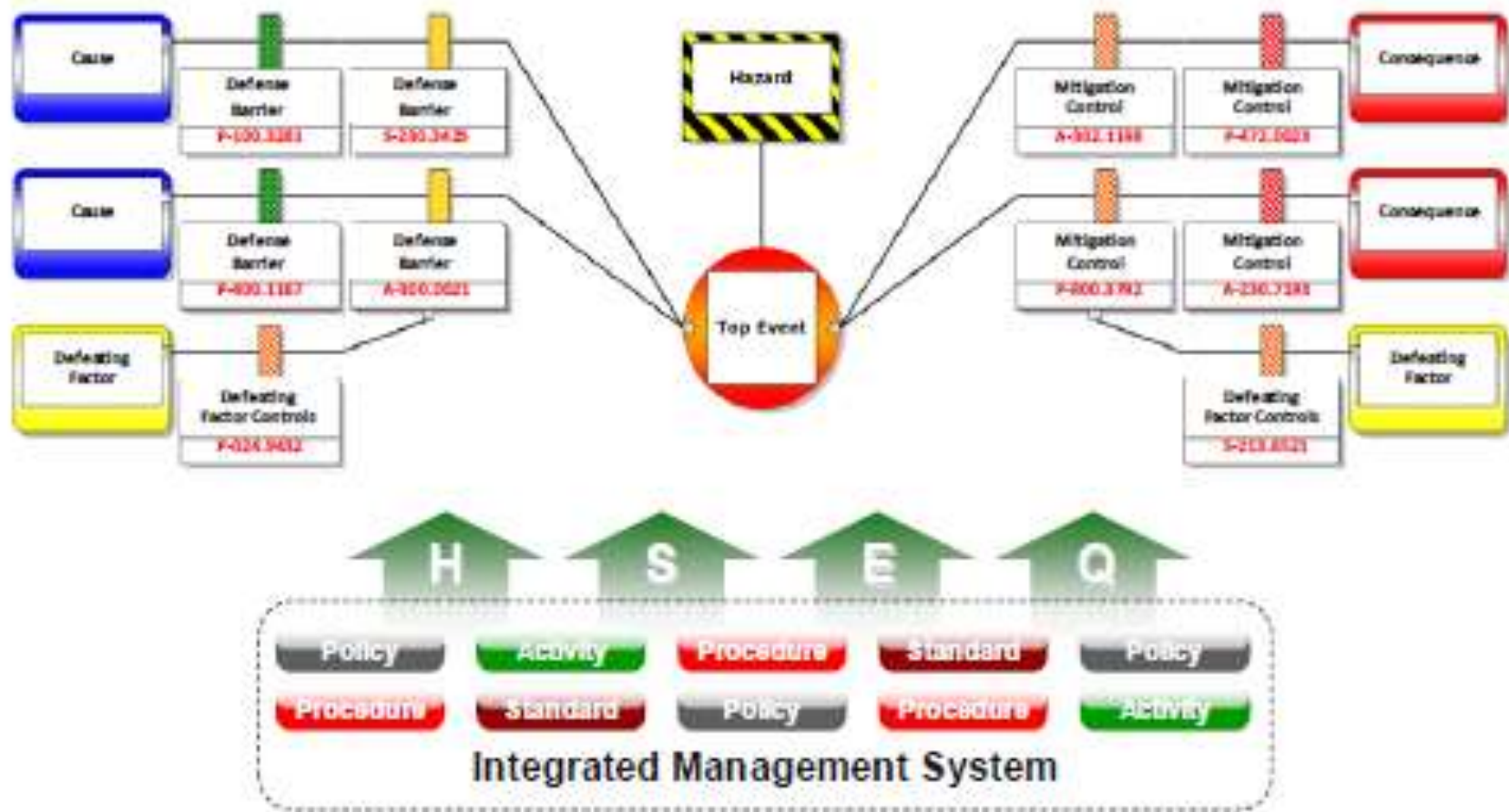


# Typical Bow Tie Diagram

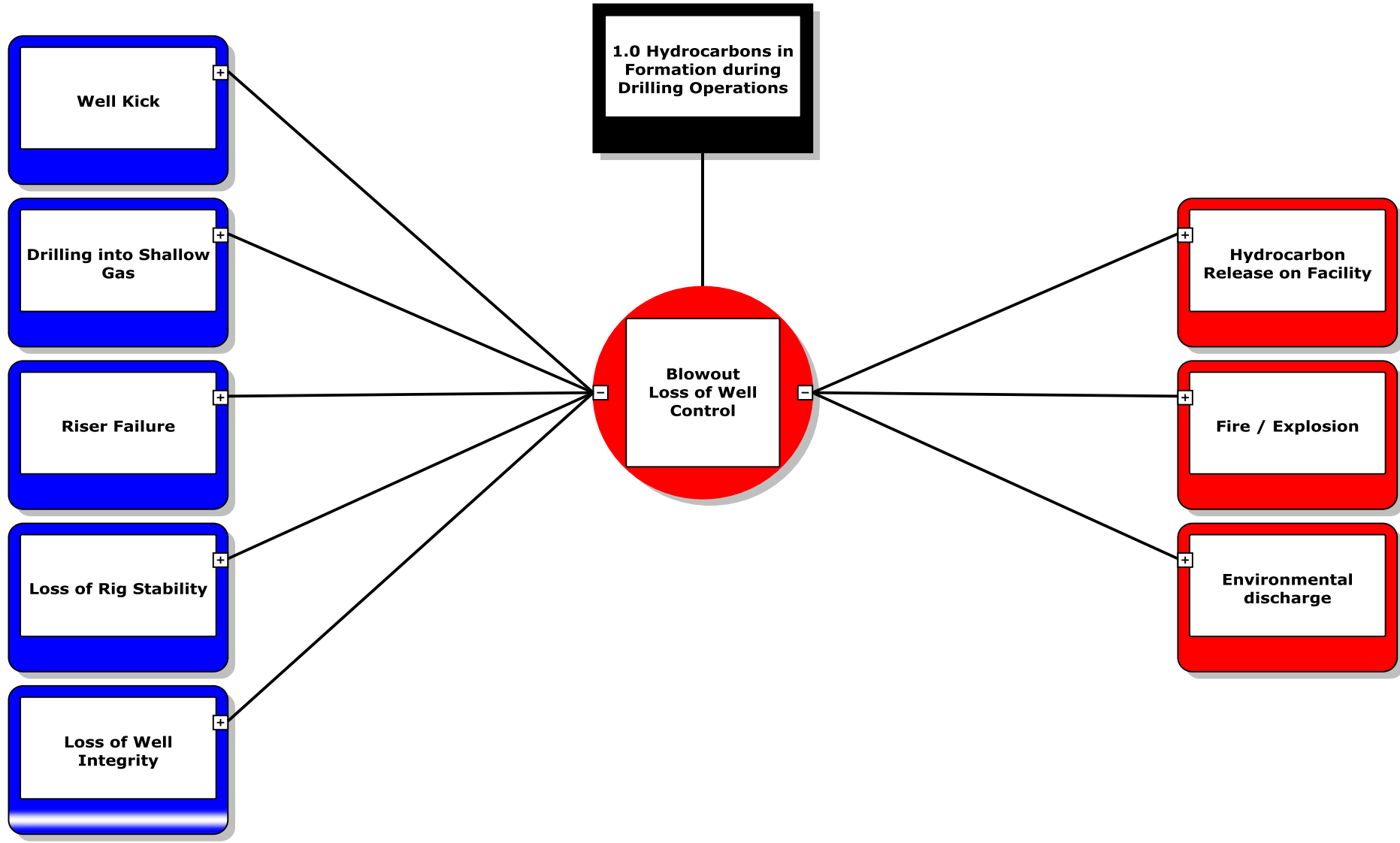


# Linkage to the Mgt System

Figure 4 BowTie Analysis Diagram

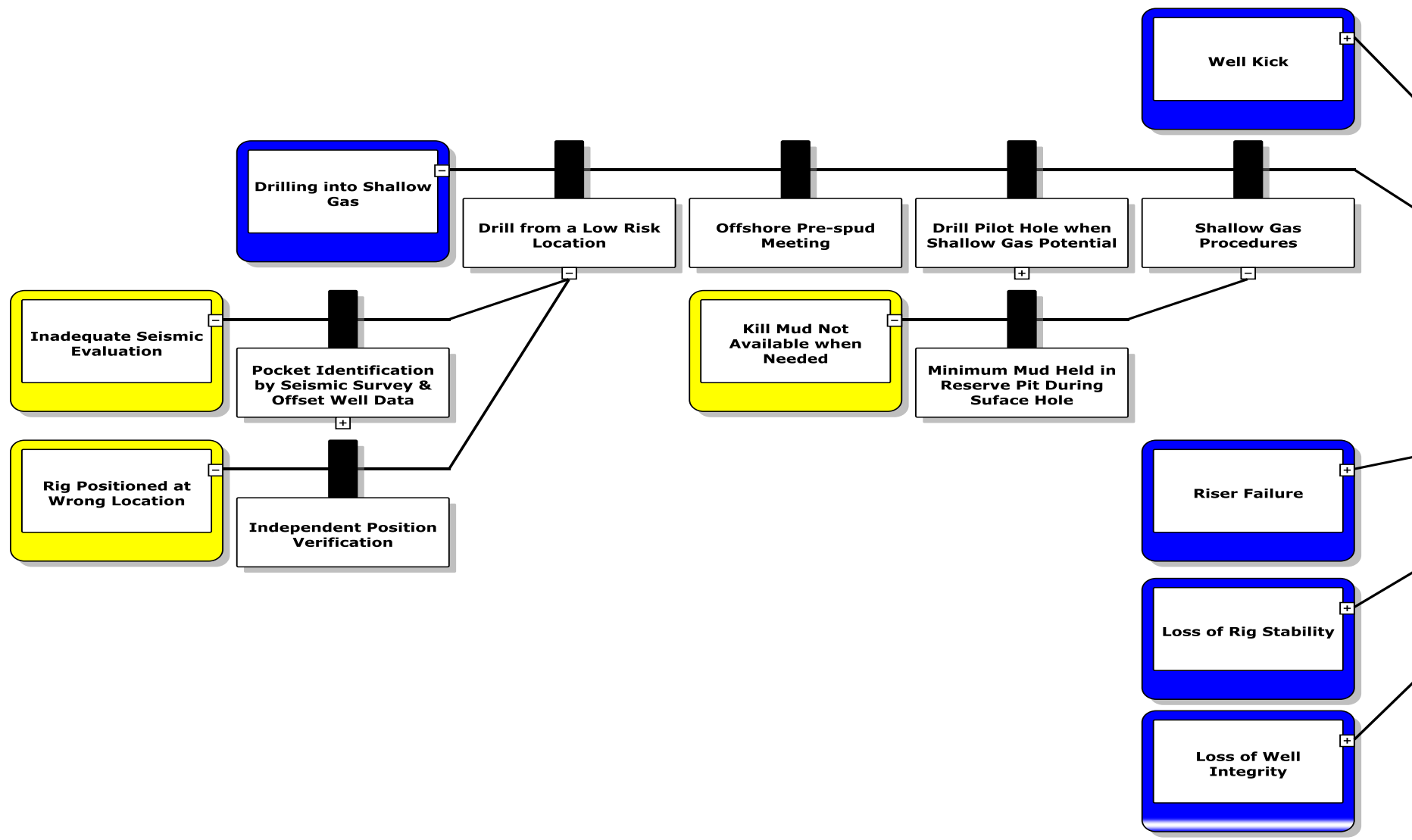


# Example – Well Control / Overview

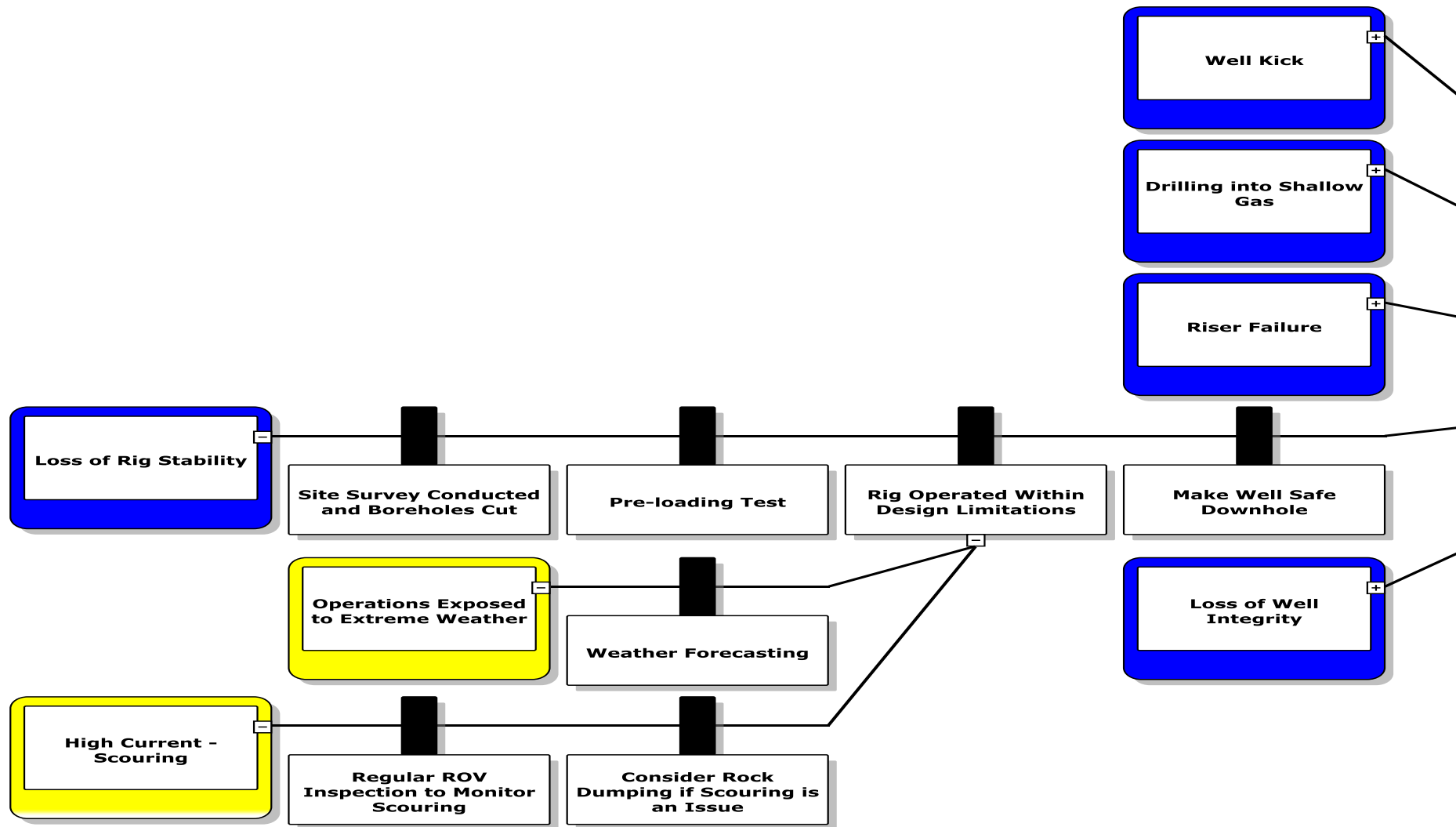




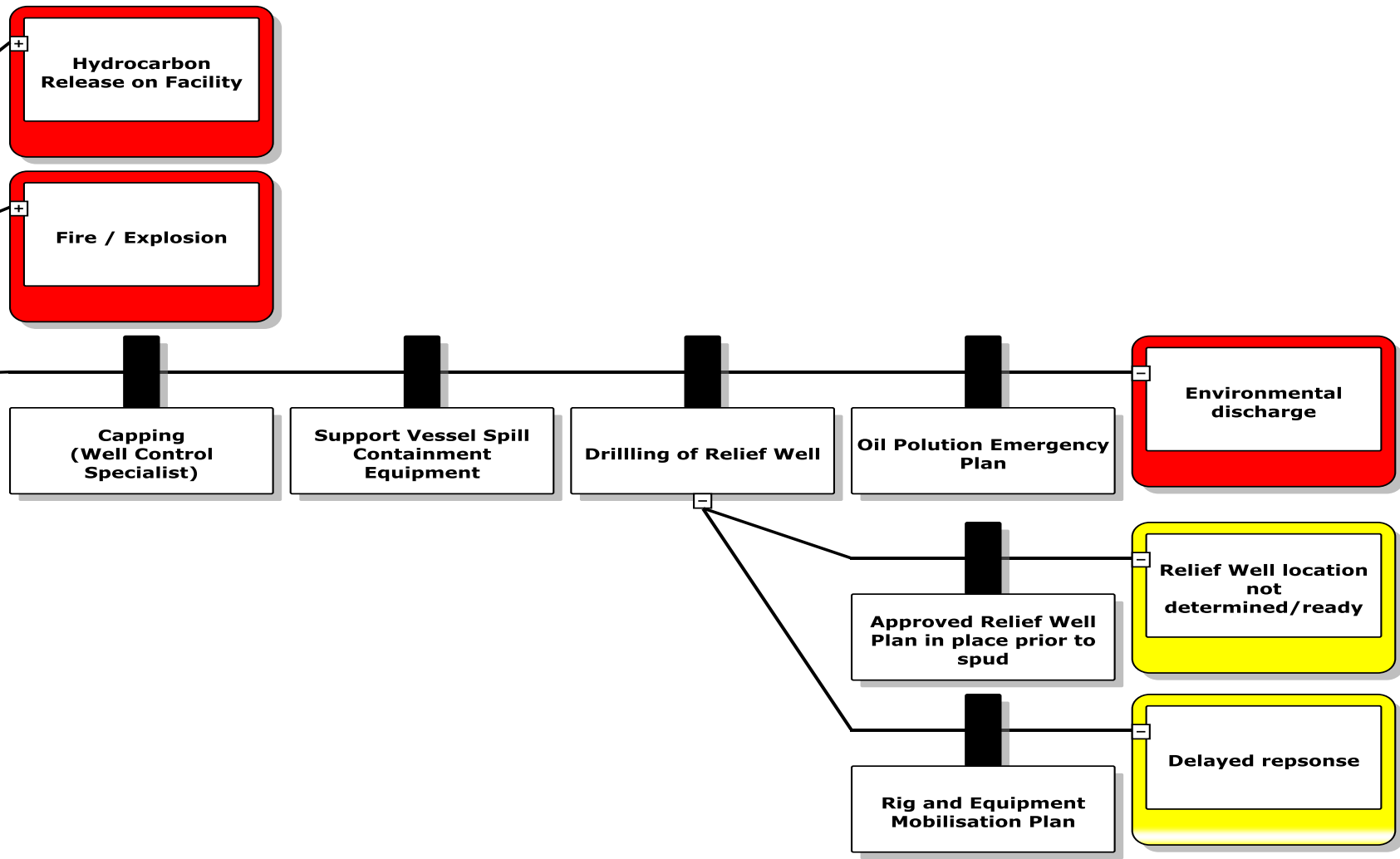
# Example – Well Control / Causes 1



# Example – Well Control / Causes 2



# Example – Well Control / Consequences 1





# Conclusions

# Conclusions – Risk Mgt

## STRENGTH

- **Effective Tool** to identify and mitigate risks throughout a company / project life cycle
- **Cost effective** when done at the appropriate stage of the Life cycle
- **Powerful tool** to drive risk awareness and an understanding of risk barriers into the workforce
- **Demonstration** (to Regulator / Stakeholders) of commitment to risk management

## WEAKNESS

- **Complexity.**
  - The modelling of multiple barriers can be time consuming and results difficult to interpret
  - Heavily information dependant. GIGO
- **Scarcity** of skilled resources
- **Lagging indicators ineffective.** Very infrequent / small population
- **Dependant on HSEMS Implementation**

# Conclusion – Bow Ties

**Bow Ties** can play an important part in this Risk Mgt process through:

- **Improving Understanding:** Communicating the results / meaning of RA into both mgt and workforce
- **Providing Assurance:**
  - That RA recommendations are implemented
  - That all barriers (hard & soft) are in place and effectively implemented
- **Supporting the delivery of leading MAH indicators** by driving assurance reviews / audits



# Overview

Risk Management is **Neither** a Panacea **Nor** Snake Oil  
It can be a very effective tool but only provided that:

- A fit for purpose HSE MS is in place
- This HSE MS is implemented through effective management
- Risk Mgt is carried out by competent staff / contractors at relevant lifecycle stages
- Actions arising from risk assessments are properly implemented
- Management and Workforce's perception of the Company Risk Management culture is aligned
- A rigorous Assurance programme is in place to verify /drive HSE MS implementation and the actioning of risk assessment recommendations