

DrillSafe – HSE Quarterly Forum

Hazard Awareness & Behavioural Safety

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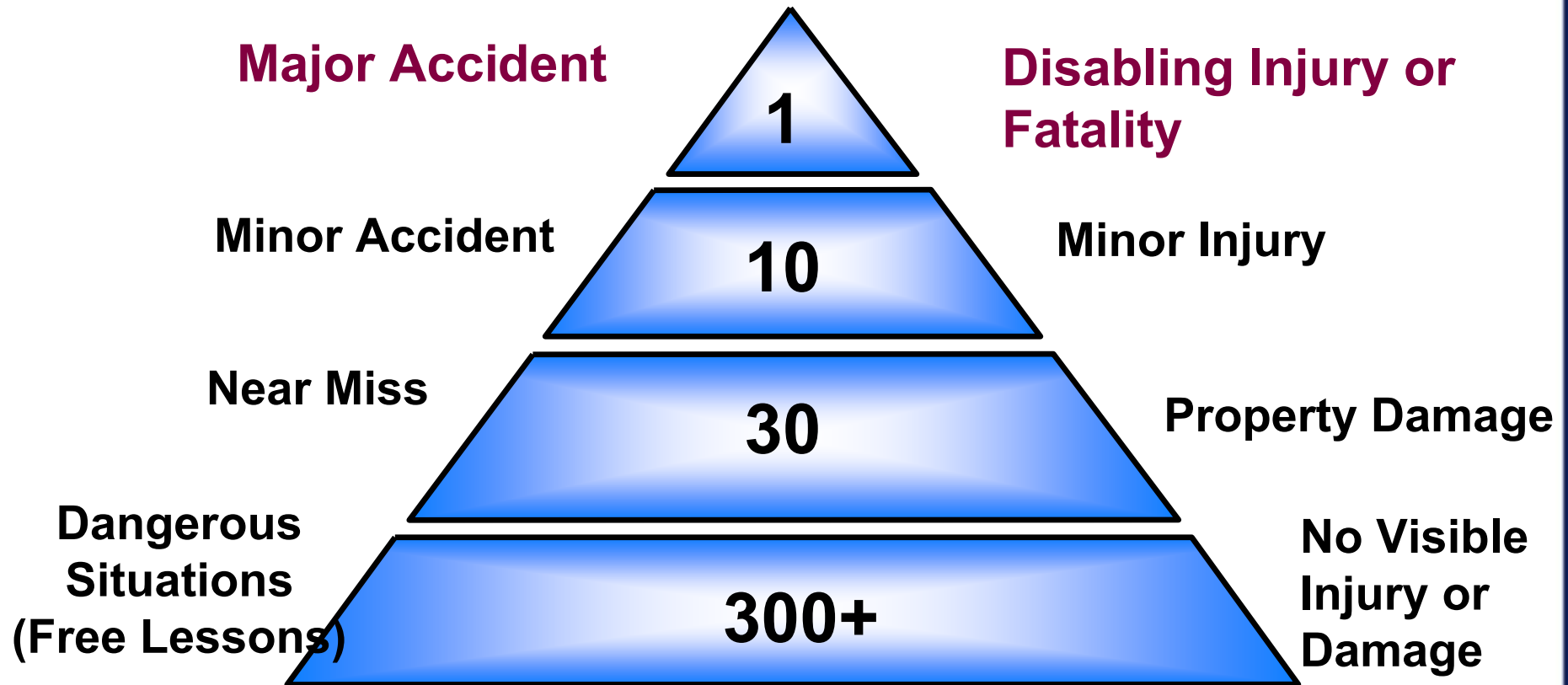
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Topics to be covered...

- Behaviour Based Safety – Person vs Systems approaches.
- Safety trends in the industry – LTI's & Fatalities.
- Approaches to Major accident (fatality) prevention.
- “Three spot lights” approach.

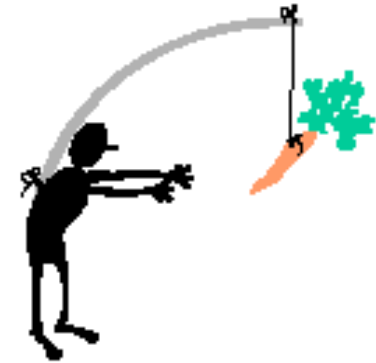


ACCIDENT PYRAMID – *THEORY?*

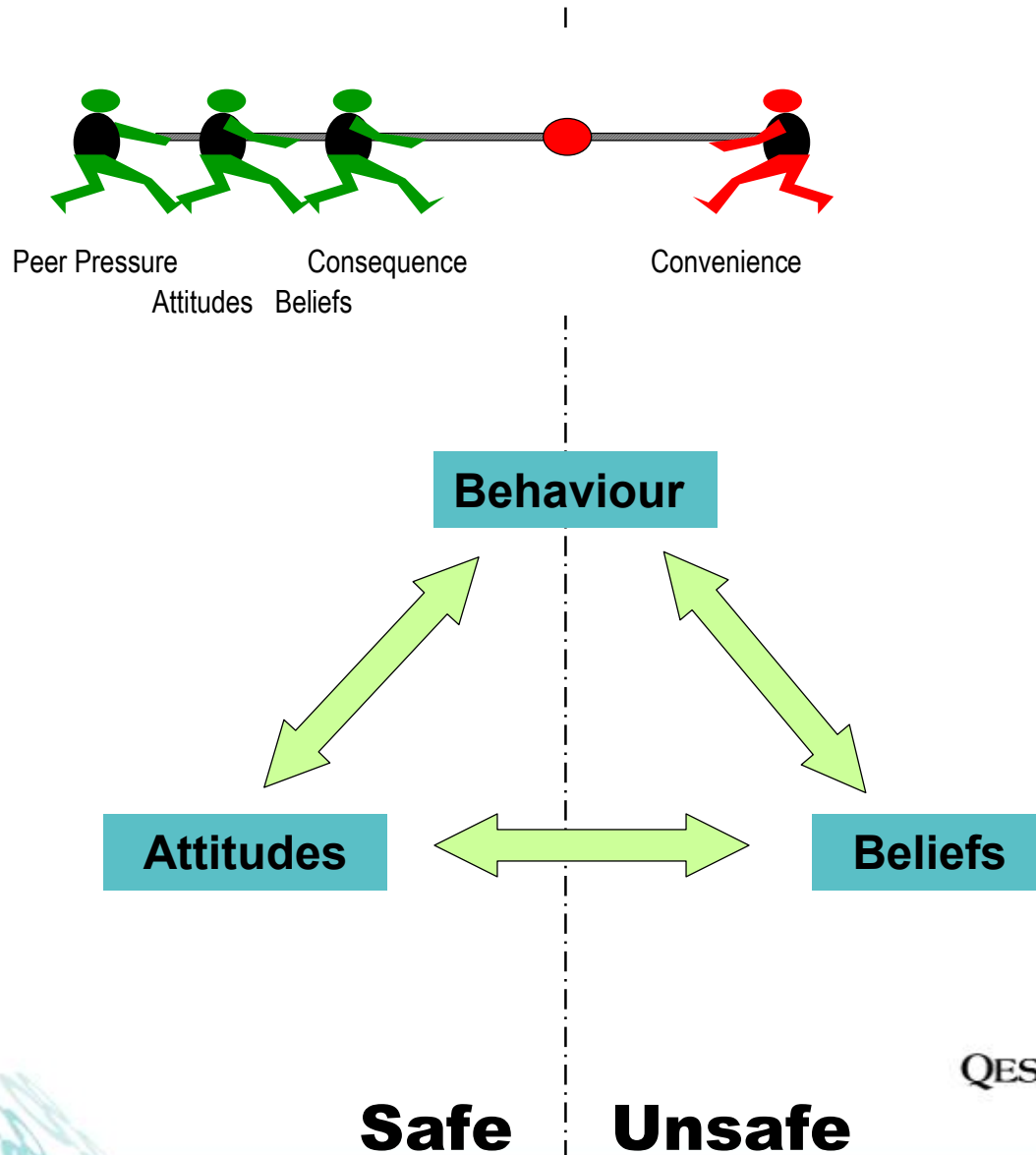


Behavioural Based Systems

- Premise suggests that a safety manager's critical task is to hunt out and stop unsafe acts.
- Most BBS programs take a "person" based approach – focus on unsafe acts of people at the sharp-end (errors & procedural violations).
- Traditional BBS programs focus on increasing rewards for behaving safety, through:
 - Education & hazard awareness (safe vs unsafe behaviour).
 - Hazard identification & peer and supervisor observations.
 - Isolating target behaviours.
 - Safety leadership.
 - Feedback to individuals & groups – positive change.
 - Recording & use of observation data.

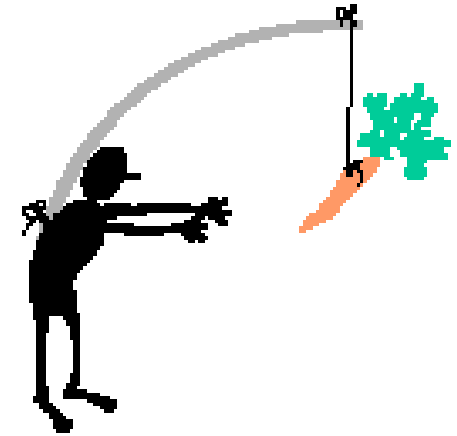


Behavioural Approach (People)



Behavioural Based Systems

- Evidence suggests that stopping unsafe acts (changing individuals behaviours) does significantly help in preventing OHS injuries.
- Many accidents on rigs are at the OHS level (not catastrophic). Most common OHS issues for drilling industry:
 - Slips & falls.
 - Overexertion.
 - Manual Handling
- **BBS APPROACHES DO NOT HOWEVER PREVENT ALL MAJOR ACCIDENTS.**



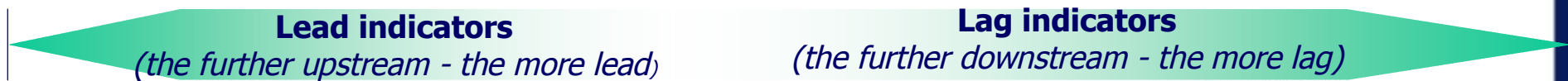
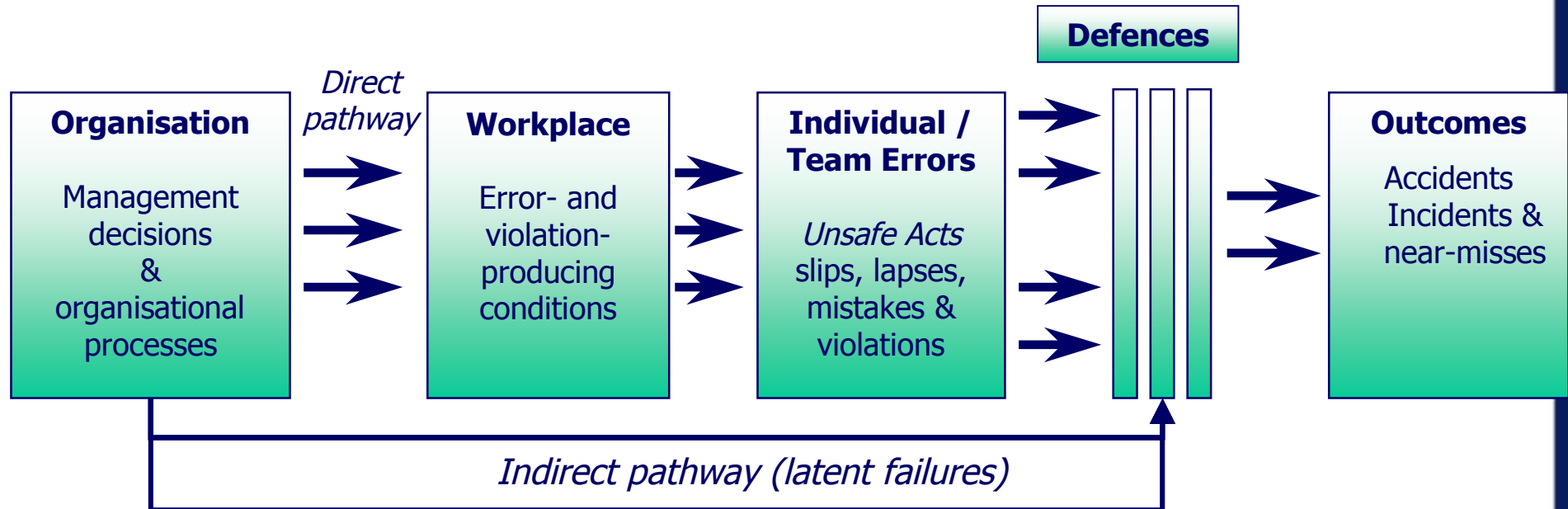
Behaviour Based Systems

Common Issues:

- Narrow scope – “person” based approach focus on individual behaviour change not causes of at risk behaviour (person vs systems approach).
- High reliability organisations are moving towards “systems” approaches which see errors as consequences rather than causes (needs to be supported by “no blame culture”).
- Needs to be supported by existing engineering and procedural processes.
- Needs to be “match” the organisational culture and facilities into which it is applied.
- Poorly integrated into existing SMS.
- Needs to be driven and absolutely believed by operational and senior management.



Organisational Error – Reason Model



Fatality Prevention through a systemic approach (Engineering)

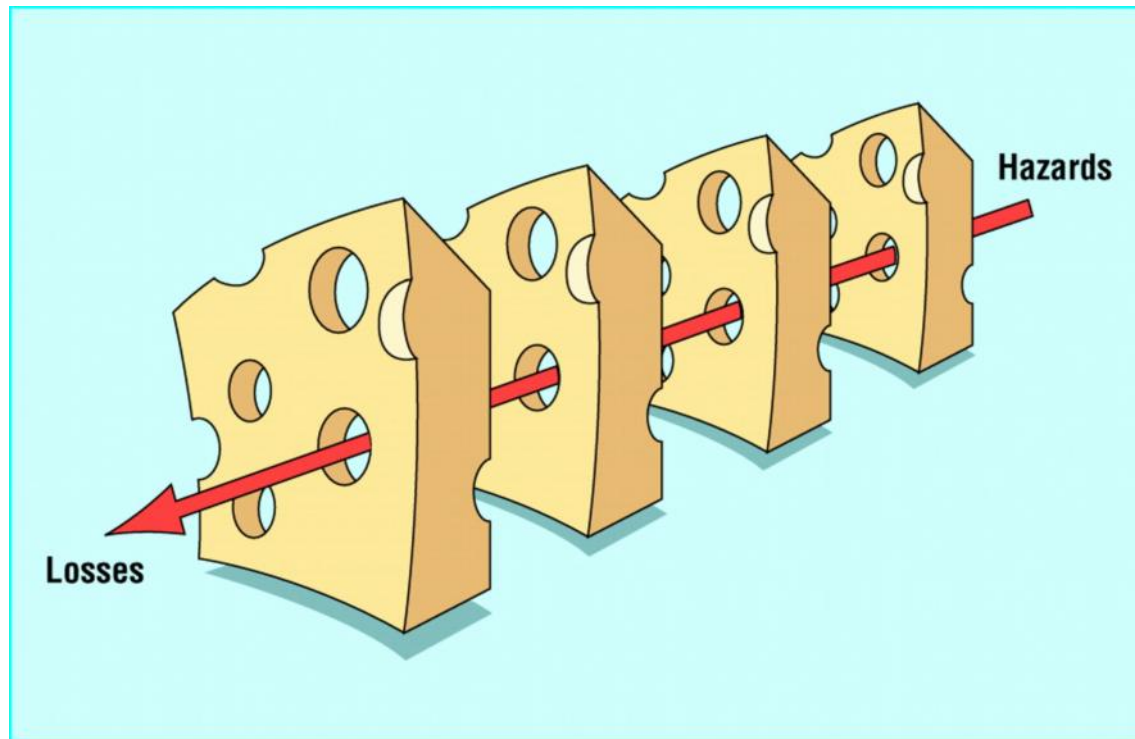
“ Rather than being the main instigators of an accident, operators tend to be inheritors of ... poor design, incorrect installation, faulty maintenance, inadequate procedures and management decisions and the like. The operator's part is usually that of adding the final garnish to a lethal brew that has been cooking...

... Systemic failures require a review of systems and not just human actions”.



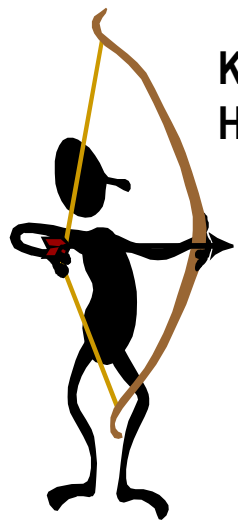
Major Accident Prevention

- *“Many accidents that result in severe injury are uniquely and singularly occurring events in which a series of breakdowns occur in a cascading effect.” Manuele, 2003*

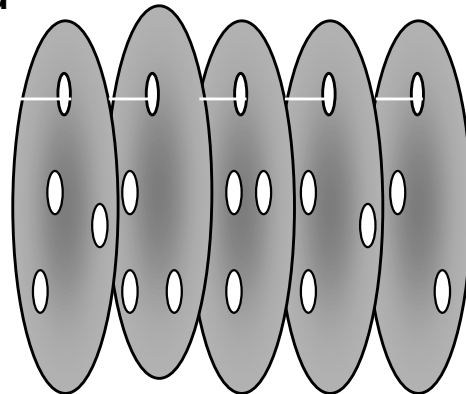


Major Accident Prevention

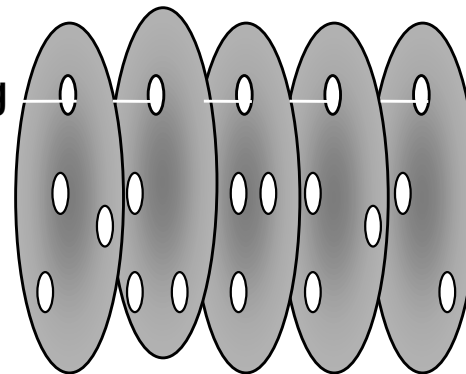
Major Hazards



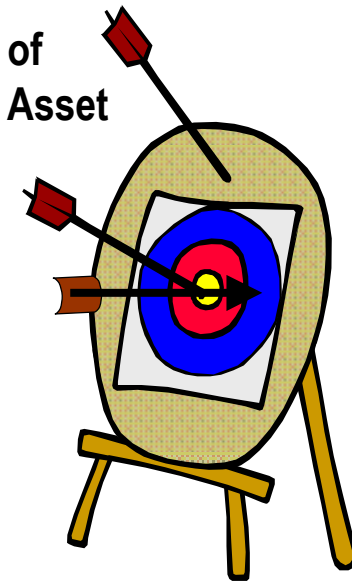
Known Hazard



Initiating Event



Loss of Life / Asset



Prevention

- Design integrity
- Limited inventory
- Preventative maintenance

Mitigation

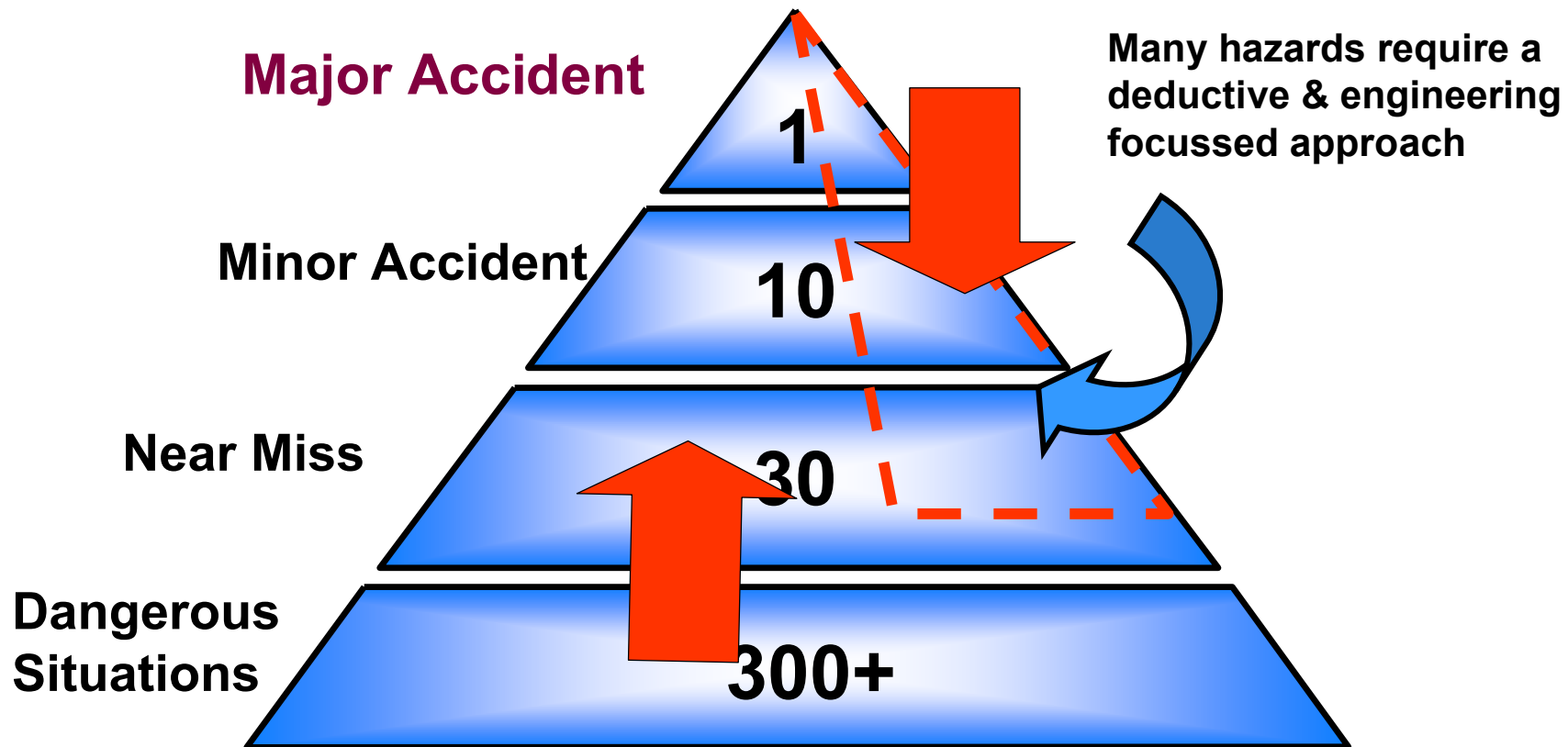
- Barricades to keep people out of area
- Emergency response procedures
- PPE



Major Incident = Rampant Beast



Accident Pyramid

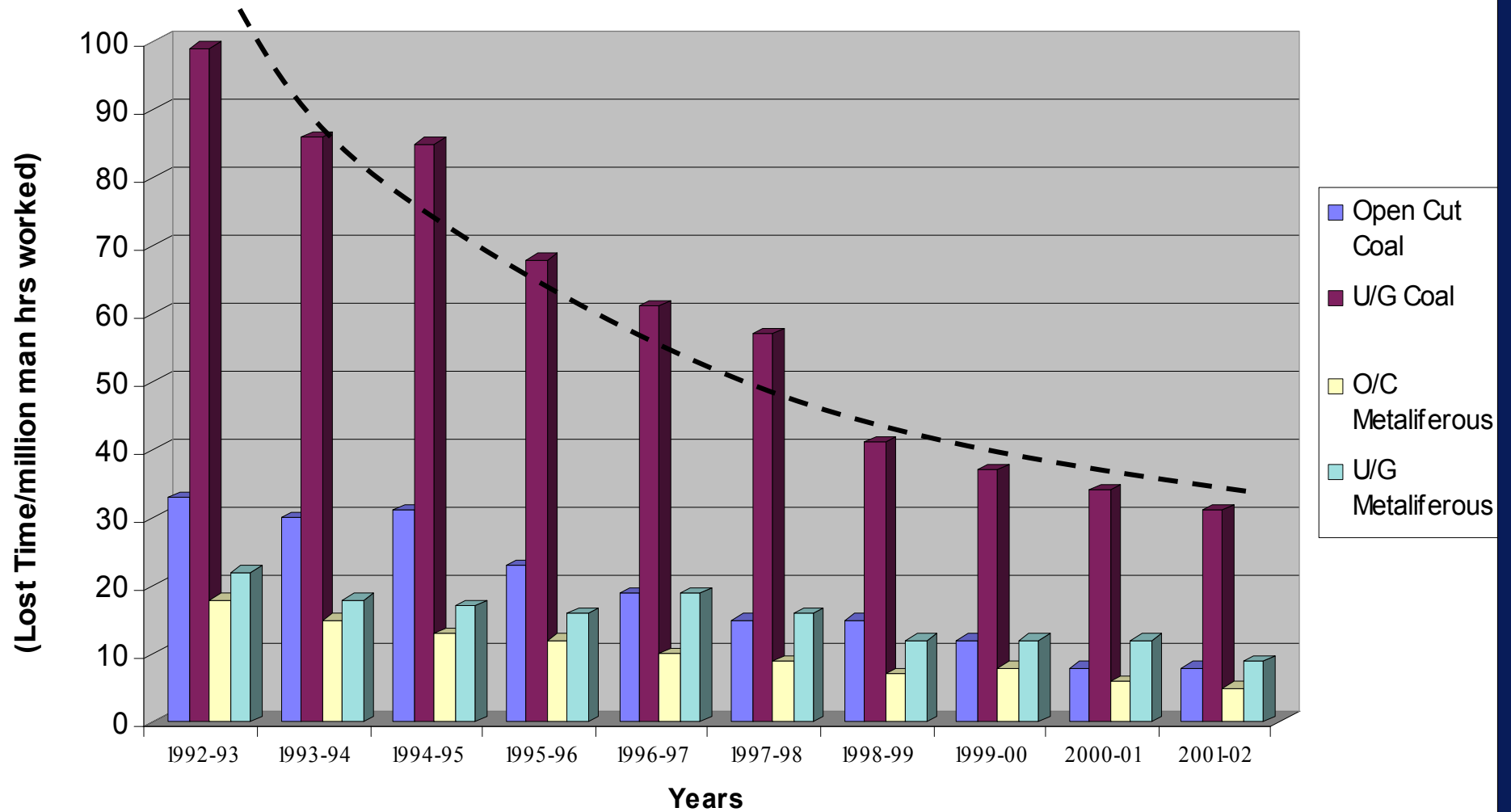


BBS & OHS Approaches

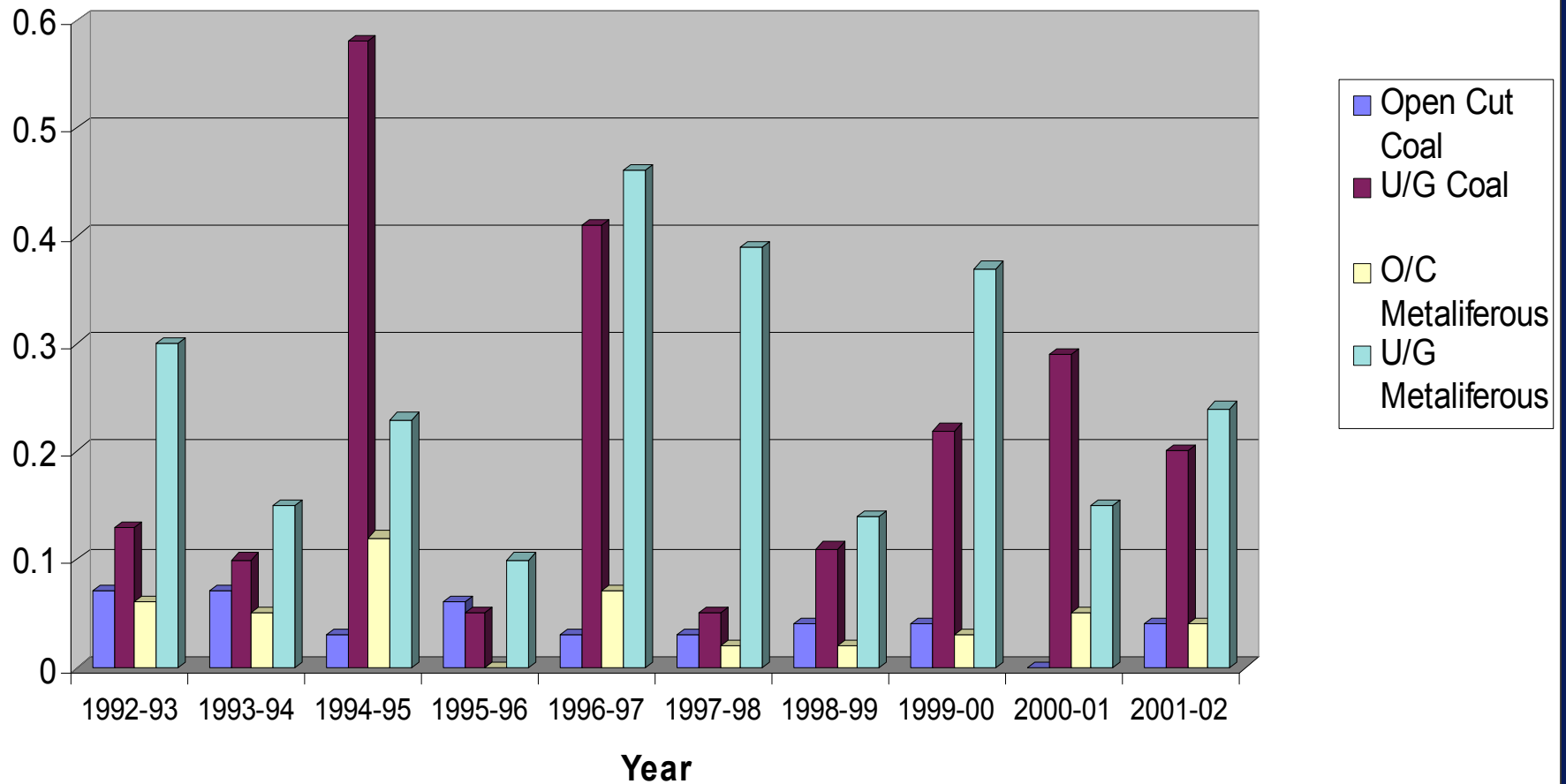
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AUSTRALIAN MINING INDUSTRY LOST TIME INJURY FREQUENCY RATE (LTIFR)

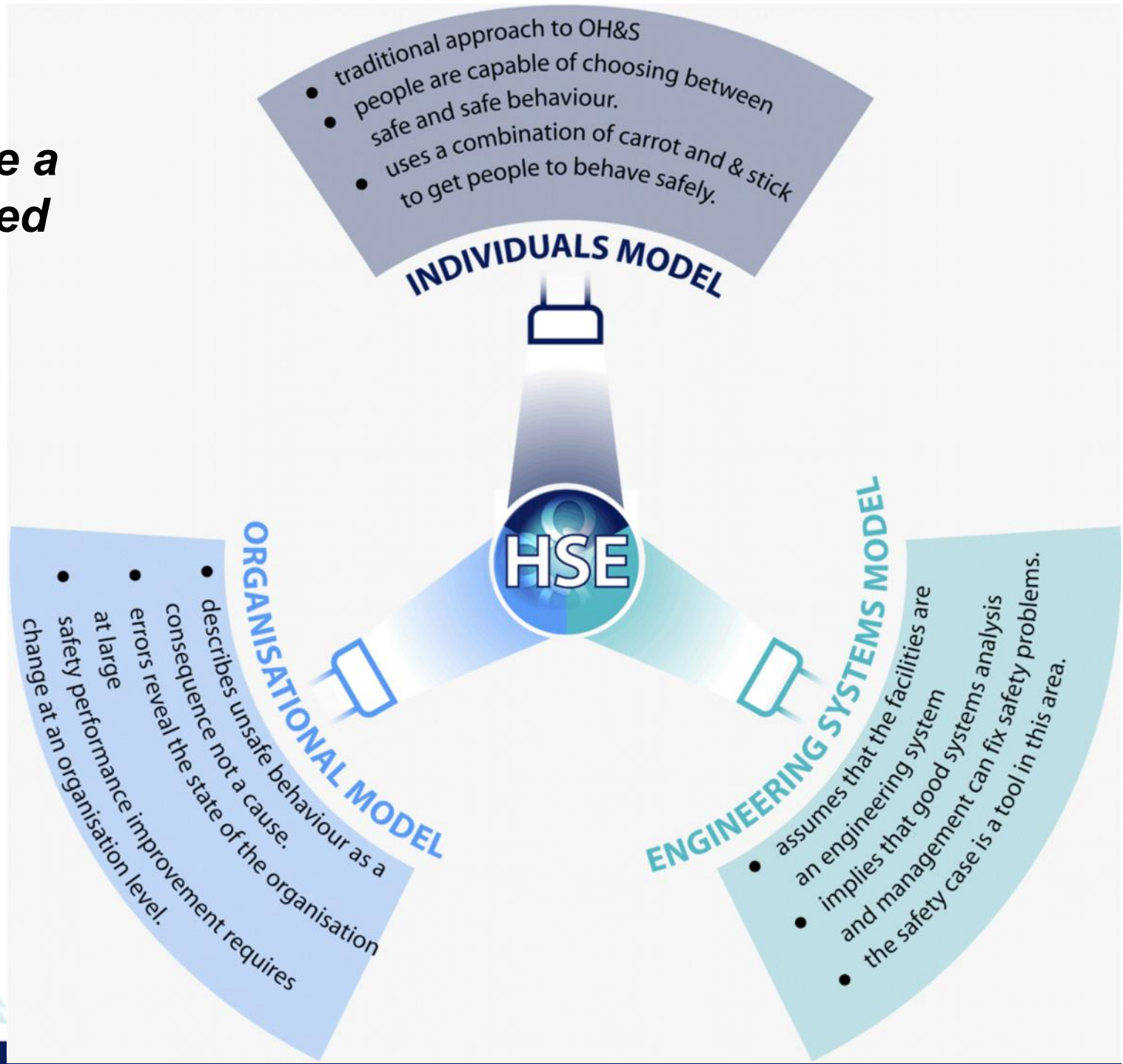


Australian Mining Industry Fatal Injury Frequency rate

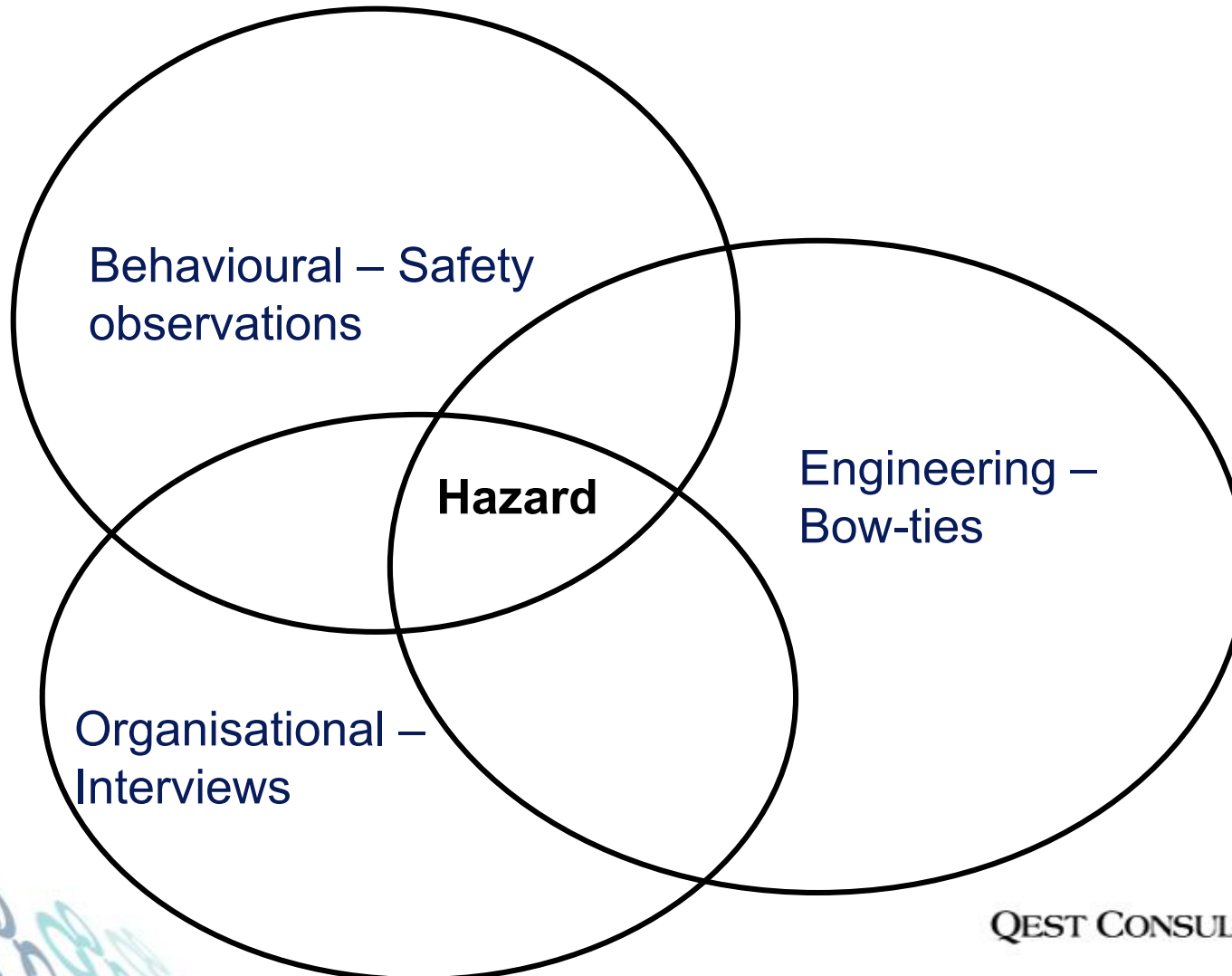


“...looking over a ten-year cycle, there is little evidence of a real reduction in the risk of fatalities. Indeed the possibility of further improvement in 1999-2000 is unlikely...”

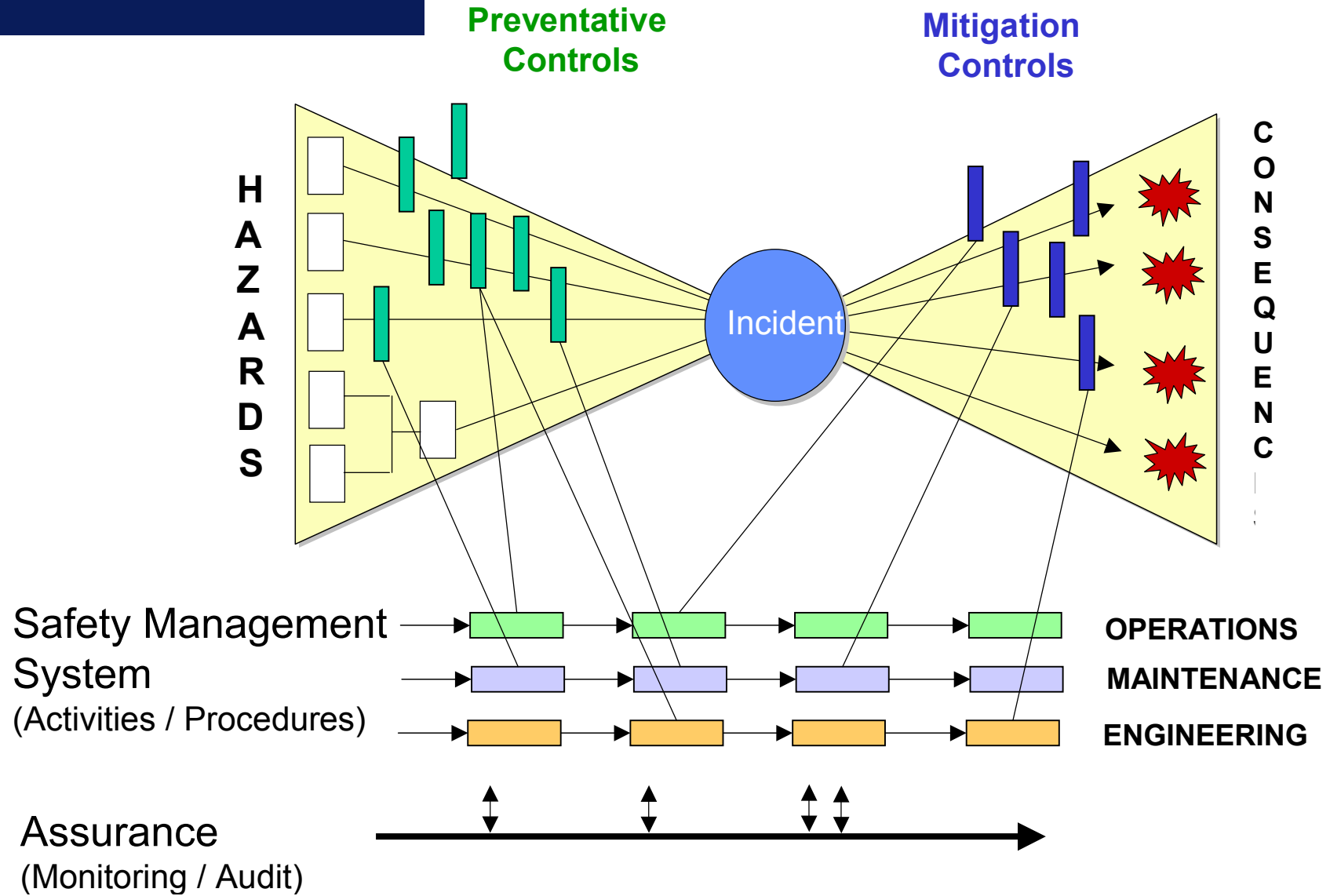
Need to take a multi-faceted approach...



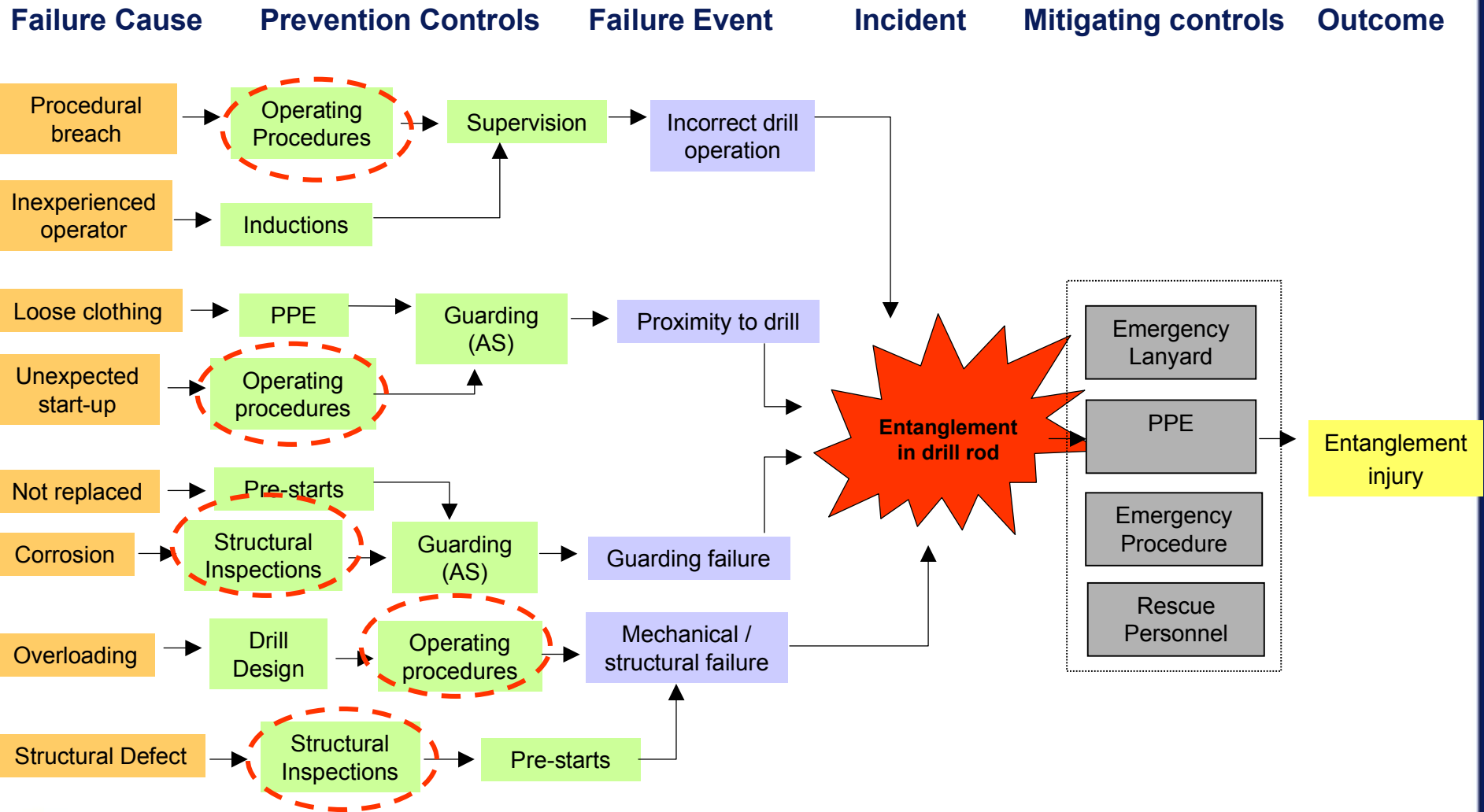
Understanding dangerous situations



Bow - Ties



A Simple Bowtie – Drilling operations



Conclusions

- Safety management requires a multi-faceted approach:
 - People approach - Behavioural safety approaches are critical to managing individuals.
 - Engineering approach – systematic and deductive approaches
 - Organisational approaches – consider organizational and cultural characteristics.
- Consider the “defence in depth” strategy – multiple layers of protection starting with good design.

