

Risktec Solutions

risk management and assessment for business

Meeting the challenges of a safety-driven organisation

Safety Engineering Conference – Feb 9th 2016

Steve Lewis & Gareth Ellor - Directors

Agenda

1. Introduction to Risktec
2. Key challenges for a safety driven organisation
3. Case Studies – a few ideas & solutions
4. Q&A

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Risktec Solutions

- Independent and specialist risk management consulting and training provider
- Part of the TÜV Rheinland Group
- We focus on:
 - Safety & risk assessment (what are the risks?)
 - Management systems (how are they managed?)
 - Culture & behaviour (what really happens!)
 - Training & education (knowledge transfer)
 - Resource solutions (specialist, flexible support)
- 260+ employees across 16 offices worldwide
- 100 associates embedded in client organisations
- ...working in 7 diverse market sectors
- ...delivered over 4,200 projects to over 1,000 clients in over 50 countries
- ...providing solutions (no two assignments are the same!)



Postgraduate Modules in Risk & Safety Management

Core Module

Introduction to Risk Management

Research Methods

Research Methods in Risk & Safety Mgmt

MSc Project

Project

Management Systems and Culture

Health, Safety & Environment (HSE) Mgmt Systems

Safety/HSE Cases

Incident Investigation & Analysis

Root Cause Analysis

Emergency Response and Crisis Management

Workplace Safety

Performance Monitoring, Auditing & Mgmt Review

Culture, Behaviour & Competency Mgmt

Business Continuity Management

Risk Assessment and Treatment

Hazard Identification

Oil and Gas Lifecycle Hazards & Risks

Nuclear Lifecycle Hazards & Risks

Risk Analysis

Oil & Gas & Process Industry Risk Studies

Engineered Risk Control Systems & Perf (Nuclear)

Risk Reduction & ALARP

Oil & Gas & Process Industry QRA

Nuclear PSA

HAZOP Study

Process Hazard Analysis

Rail Industry Hazards & Risks

Bowtie Risk Management

Engineered Risk Control Systems & Perf (Oil & Gas)

Rail Safety Analysis

Fault Tree & Event Tree Analysis

Process Safety Mgmt in Design & Operations

Rail Risk Management

Functional Safety (including SIL)

Asset Integrity Risk Management

Maritime Risk Management

Availability, Reliability & Maintainability (ARM)

Offshore Wind Farm Safety Assurance & Justification

Physical Effects Modelling

Human Factors in Design & Operations

Environmental Risk Assessment

Module key:

Cross-industry

Oil & Gas & Process

Nuclear

Rail

Marine

Renewables

Other Training Courses

For details of our accredited maritime safety and security officer modules please visit www.intmarsec.co.uk

Leadership

HSSE Leadership for Managers

HSSE Risk Management for Managers

HSSE Leadership for Supervisors

Project Risk Management

Software

BowTieXP Software (Basic and Advanced)

Investigator 3 Software

Nuclear Foundation Modules

Nuclear Reactor Basics

Implementing a Regulatory Regime

Nuclear Reactor Safety Principles

Radiological Protection

Principles of Regulatory Systems

Radioactive Waste Management

Risk Reduction



Thales

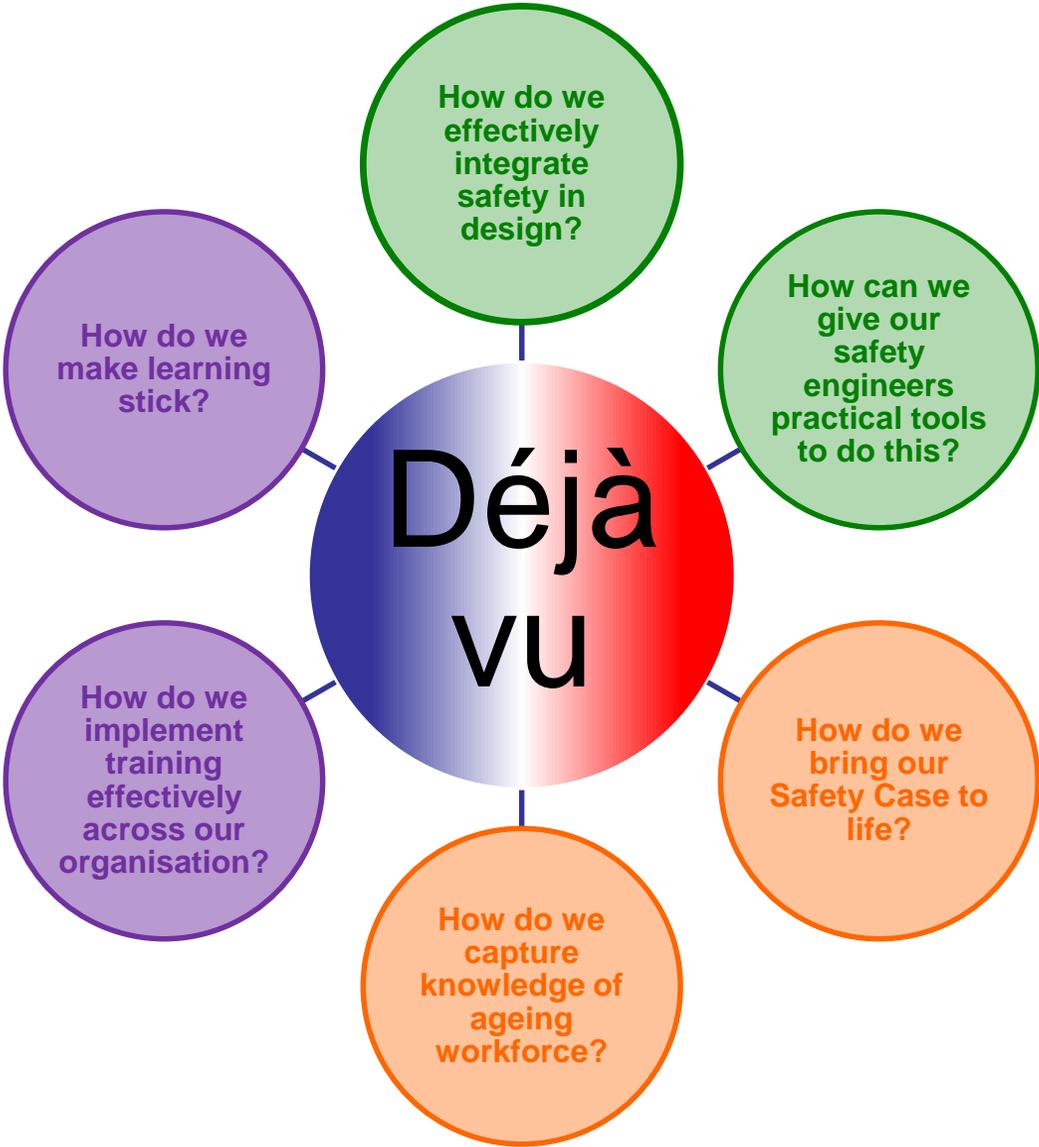
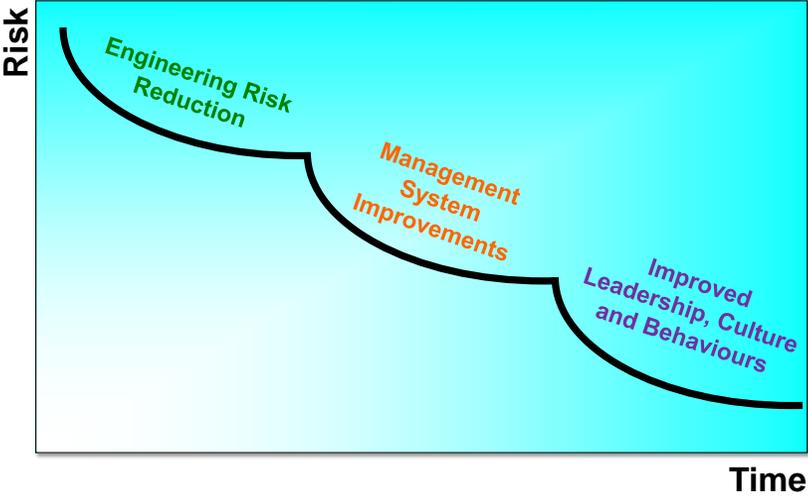
- Safety and Assurance for Jubilee and Northern Line Upgrade Project (JNUP)
- Safety Cases for Neasden Depot
- Safety Cases for Train Protect & Warning System (TPWS) for Network Rail
- Safety Assessment for the Manchester Metrolink Project
- Safety Case for the Train Management System (TMS) Project for Network Rail
- Safety and Assurance for London Underground Four Lines (Signalling) Modification Project (4LM)
- Submarine Periscope System Safety Support Thales Optronics Glasgow

THALES

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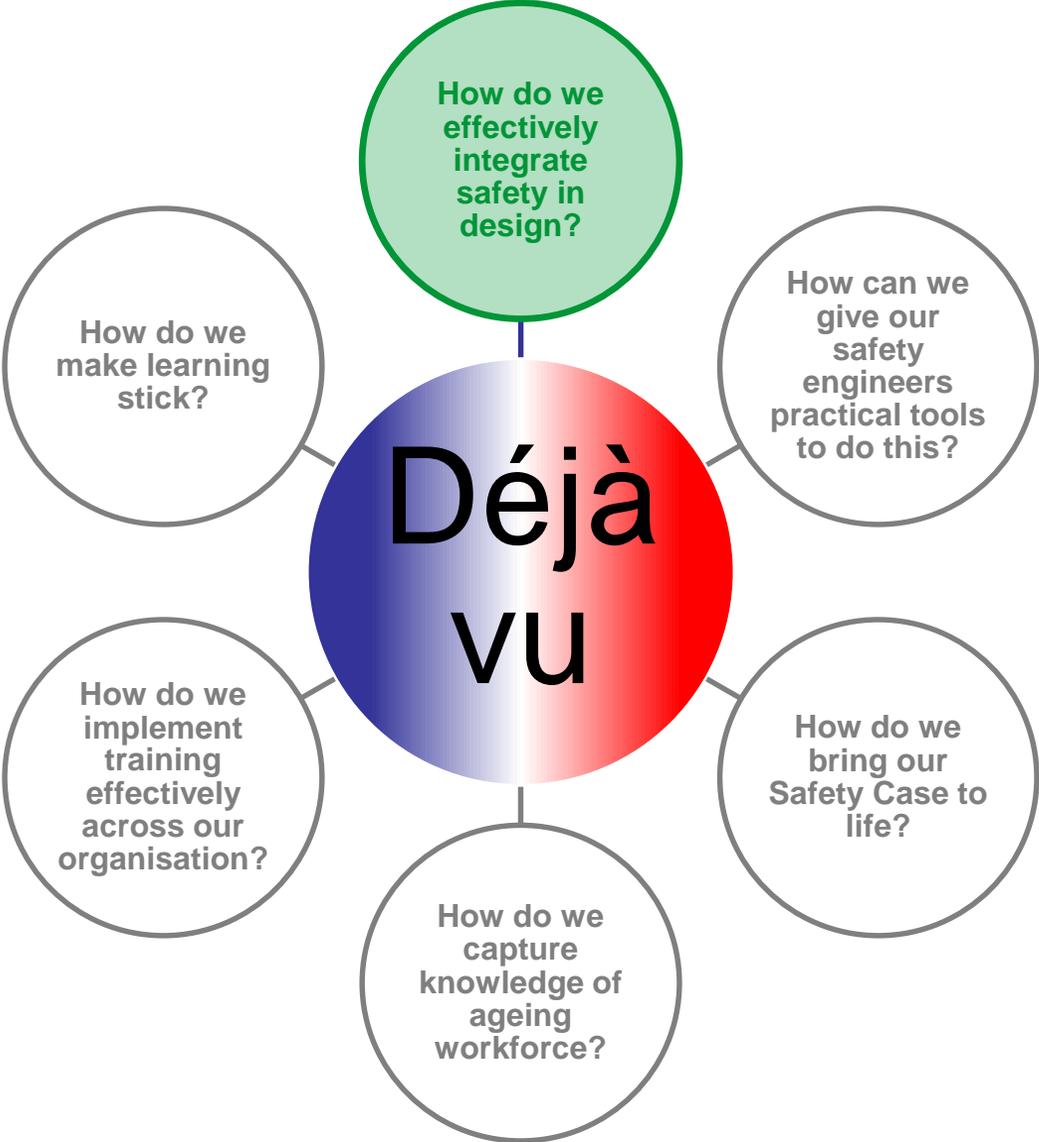
Mange tout Rodney



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A few ideas & solutions



A shared goal?



What the Customer wanted



How the Customer explained it



How the Project Manager understood it



How the Engineer designed it



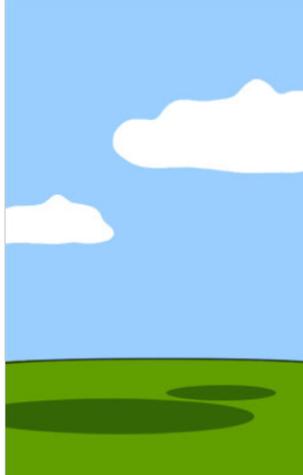
What the Site Team installed



How Management explained it



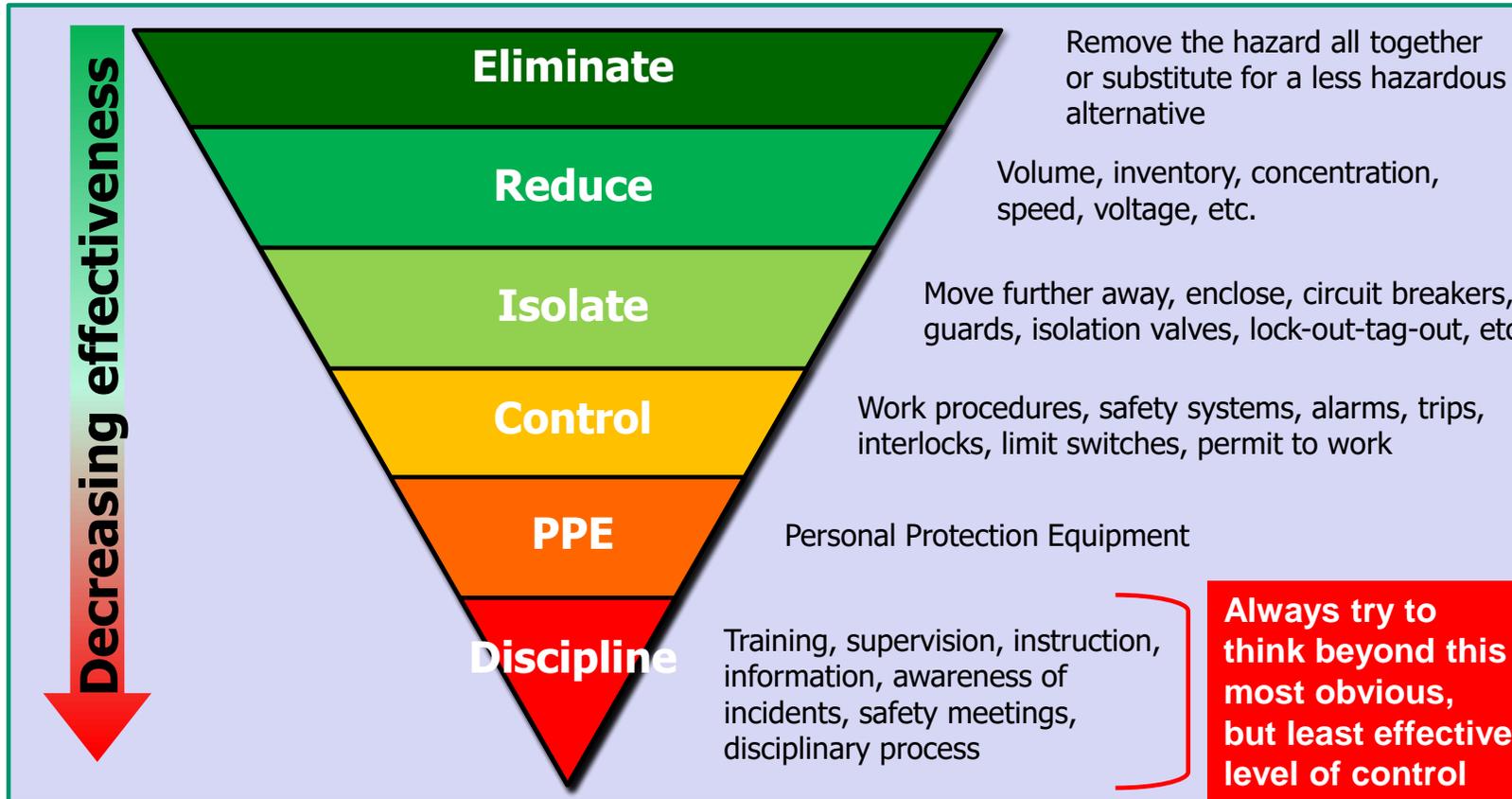
What the Safety Case had to justify



How the Project was documented

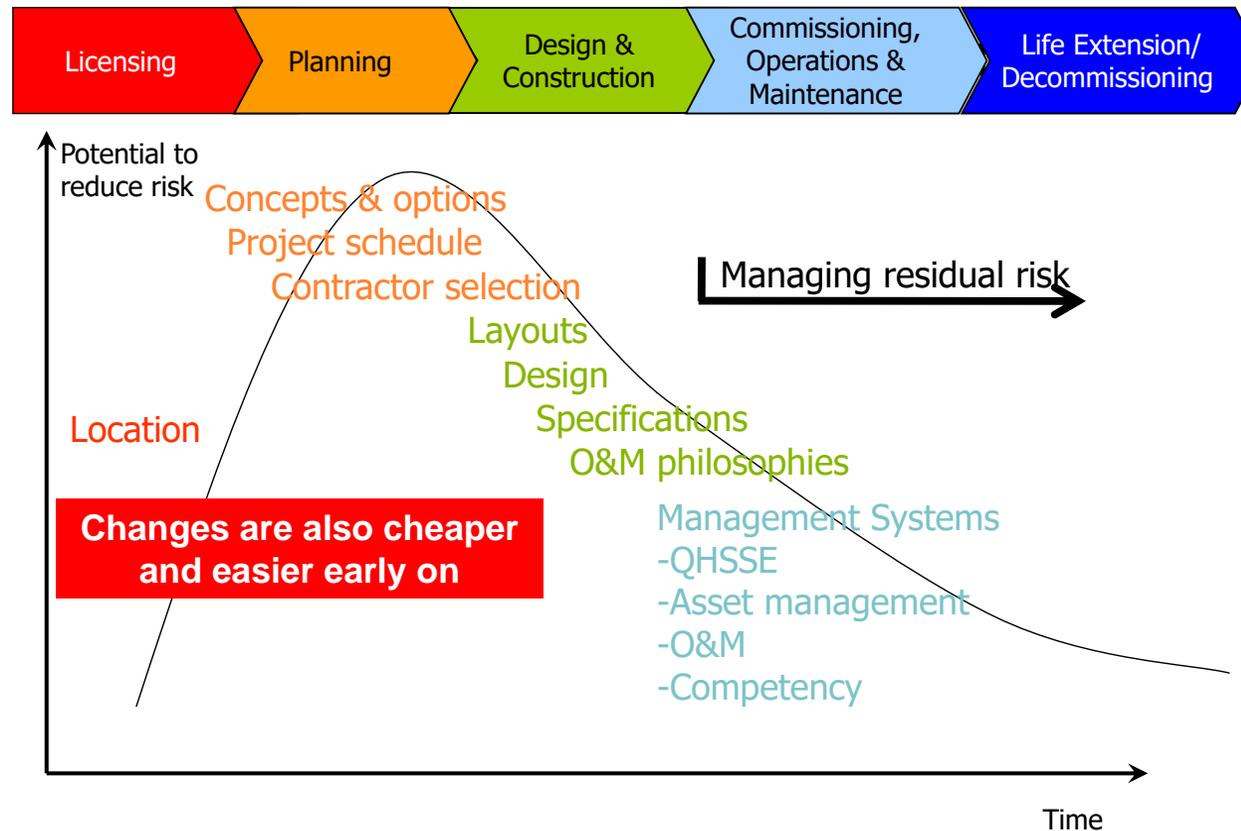
Why integrate safety in design

1. To get things right.
2. To reduce risks ALARP

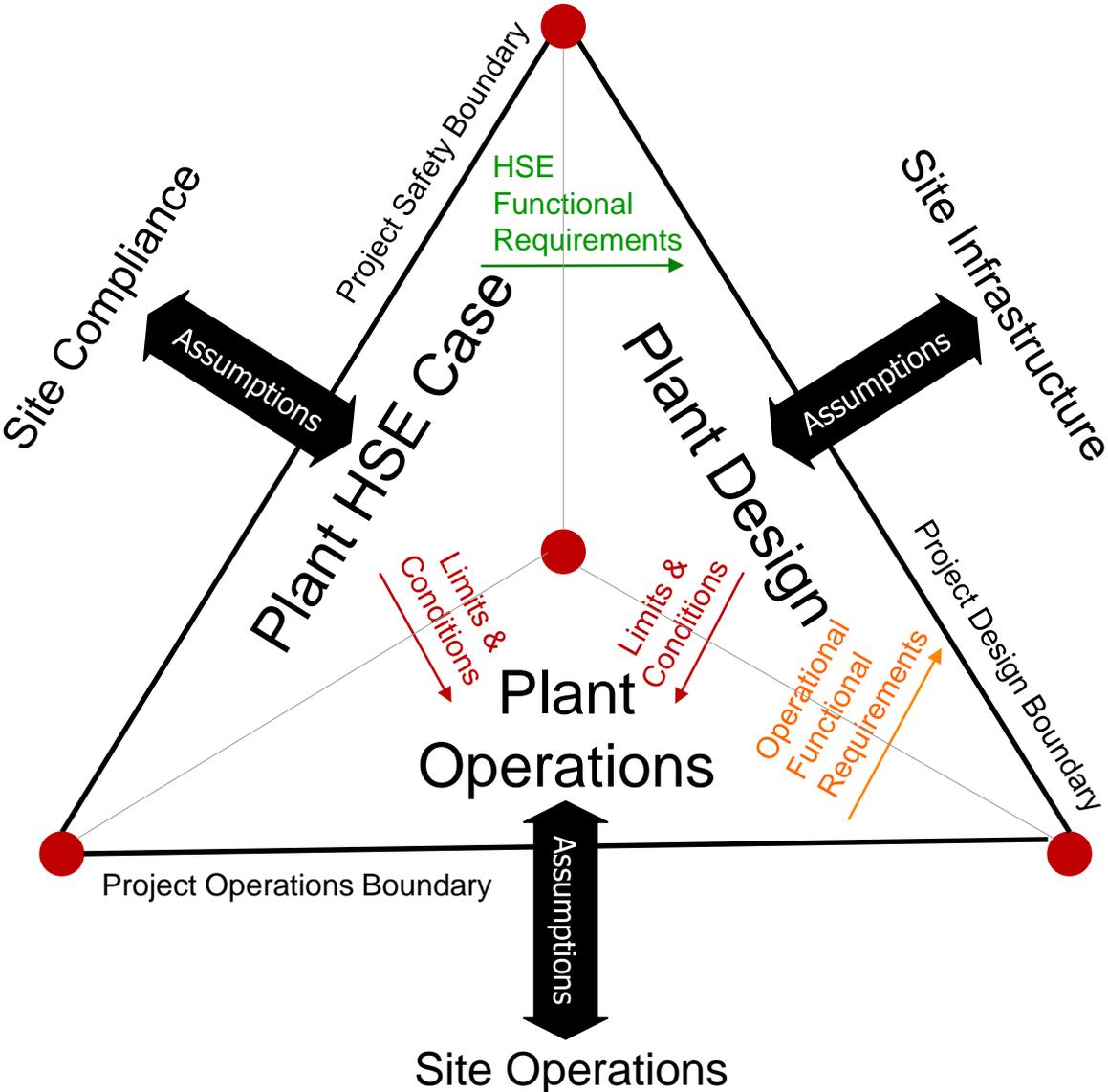


Why integrate safety in design

1. To get things right.
2. To reduce risks ALARP.
3. To reduce costs!

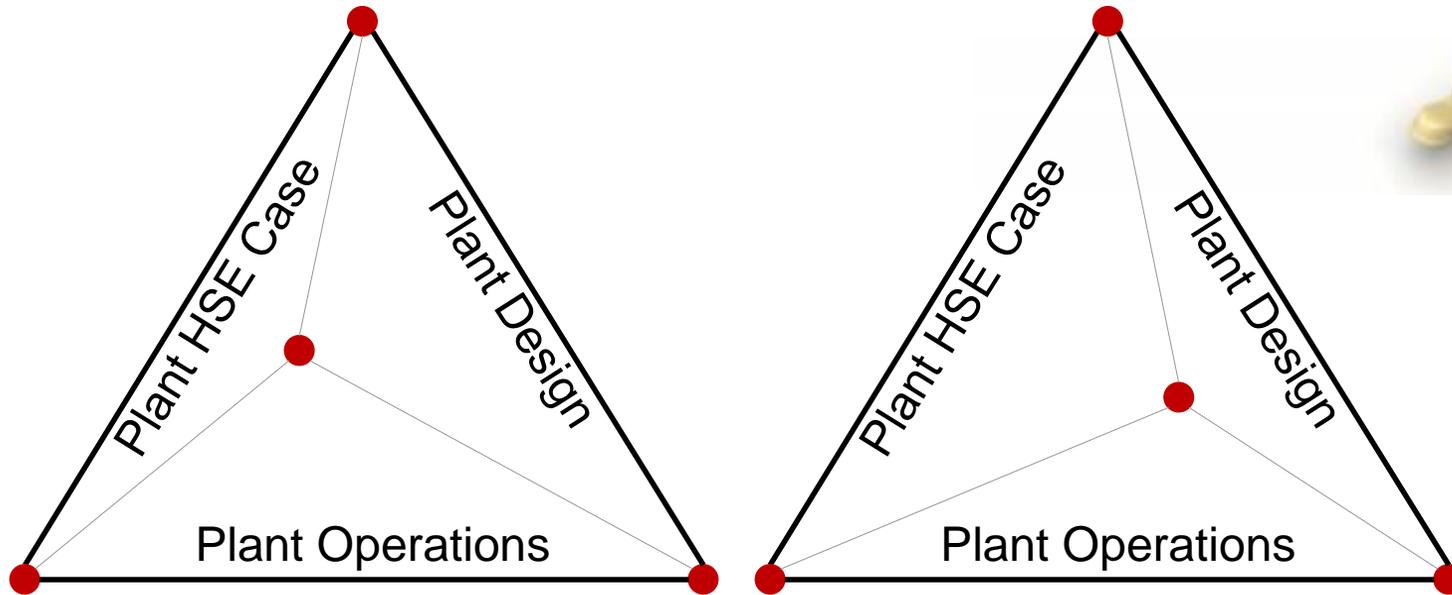


Design v Ops v Safety Case Study: Nuclear Defence



Success Factors

1. It's a juggling act! “**Negotiate**” between the three elements to find the optimum overall **compromise**!
2. Ensure all three elements remain in **harmony** at all times.

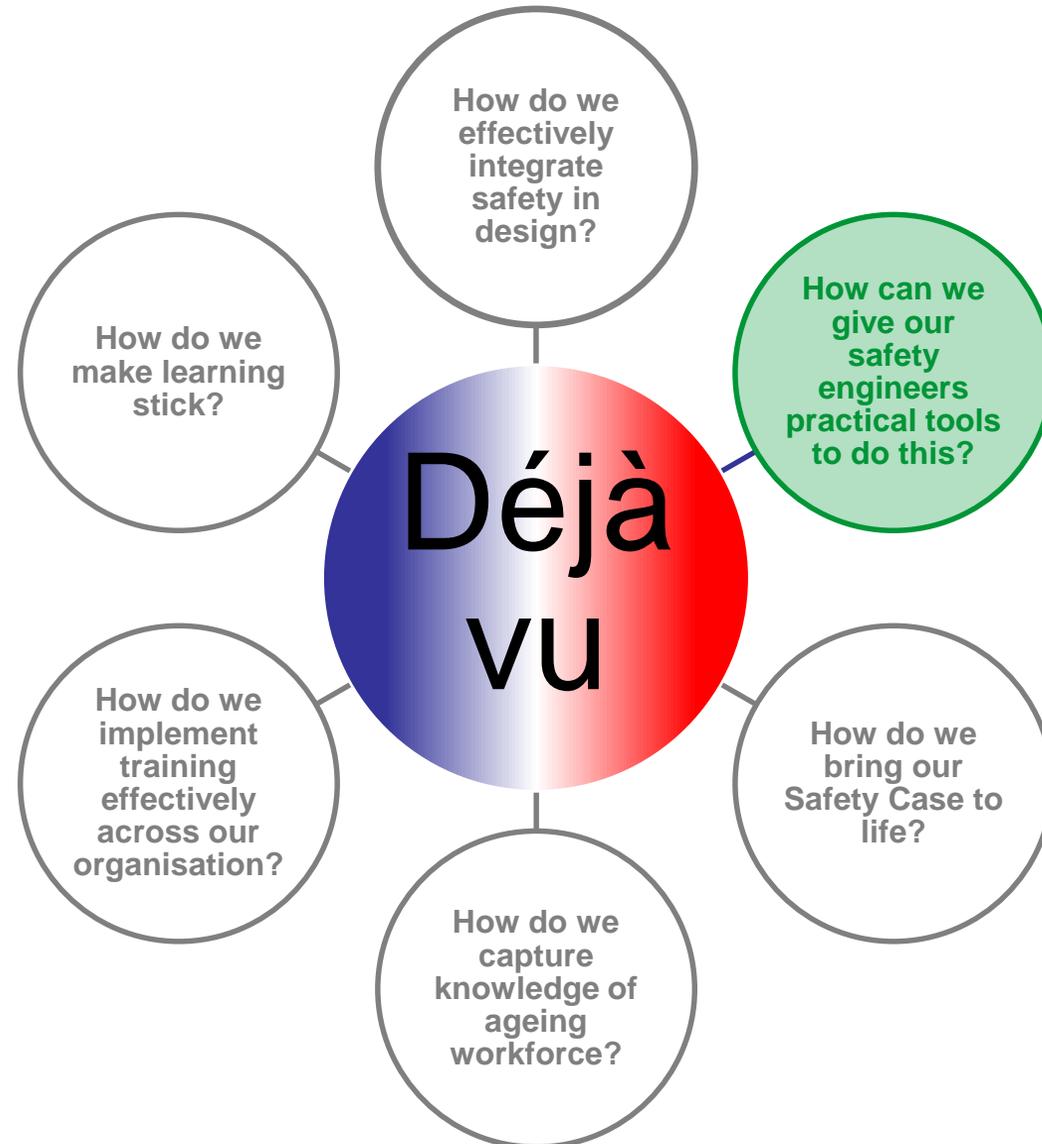


Success Factors

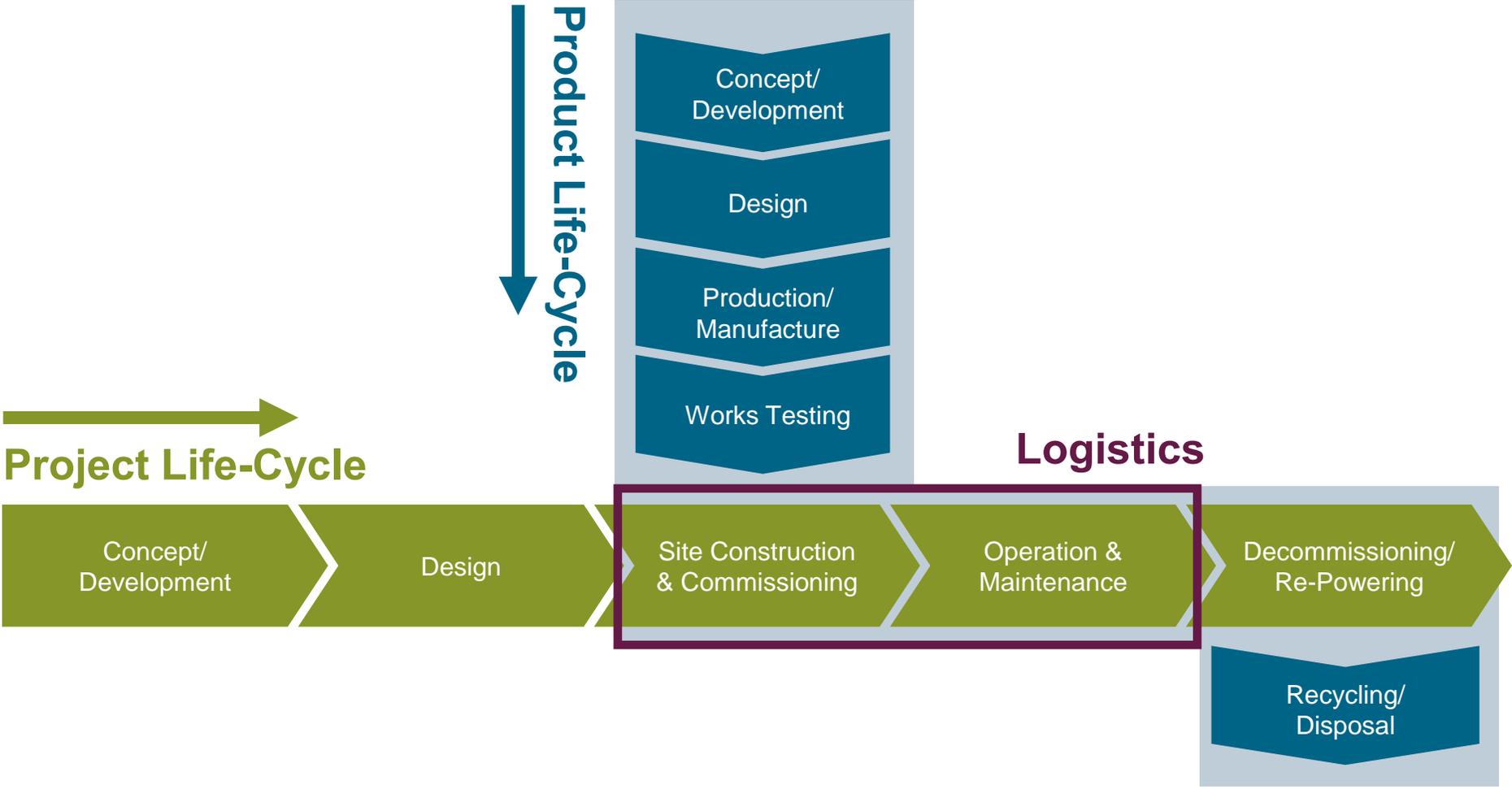
1. It's a juggling act! "Negotiate" between the three elements to find the optimum overall compromise!
2. Ensure all three elements remain in in harmony at all times.
3. Start early! A truly ALARP solution can only be reached if integration starts from concept design.



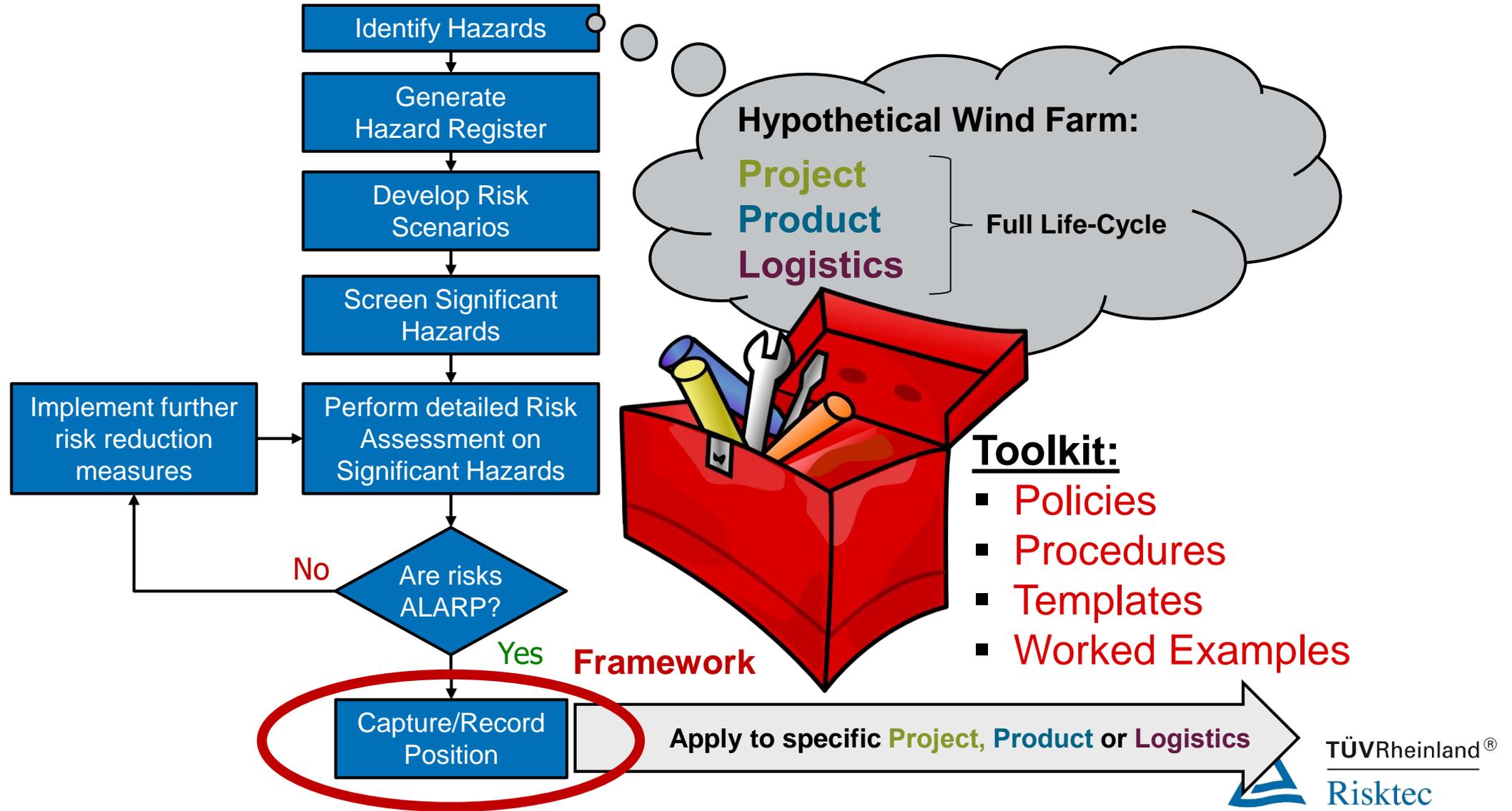
A few ideas & solutions



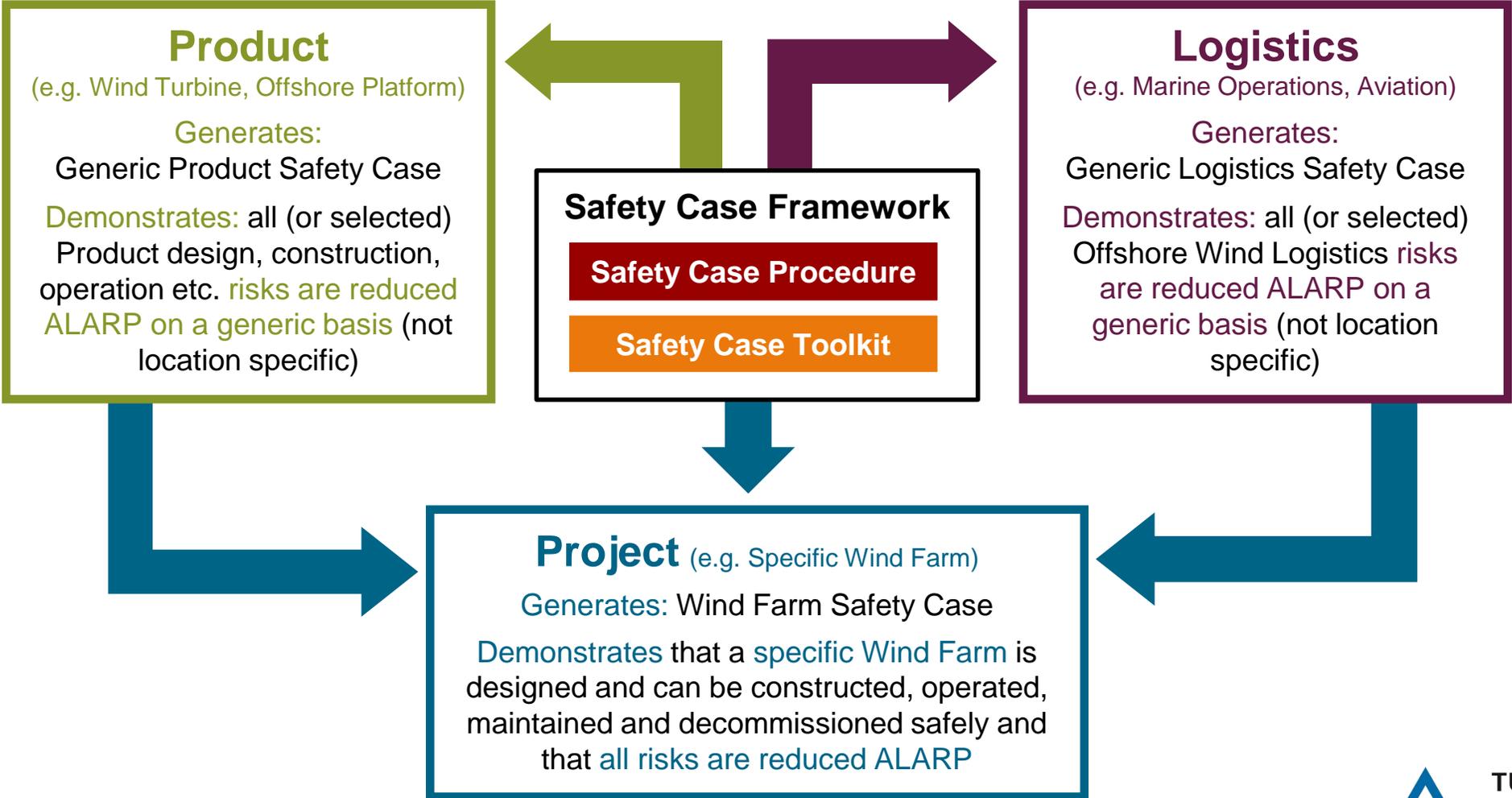
Case Study: Siemens Offshore Wind Safety Case Framework



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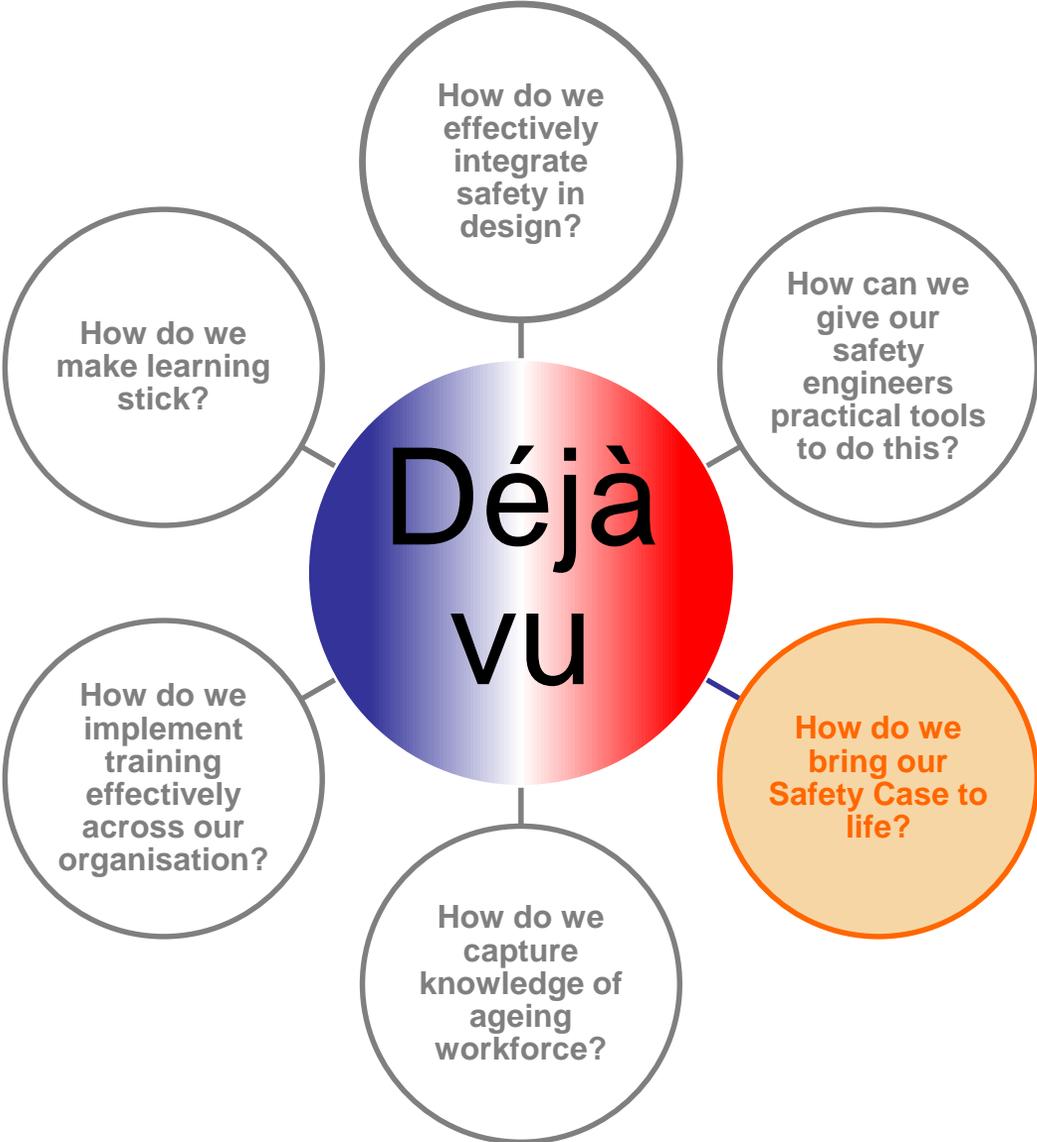


Case Study: Siemens Offshore Wind Safety Case Framework

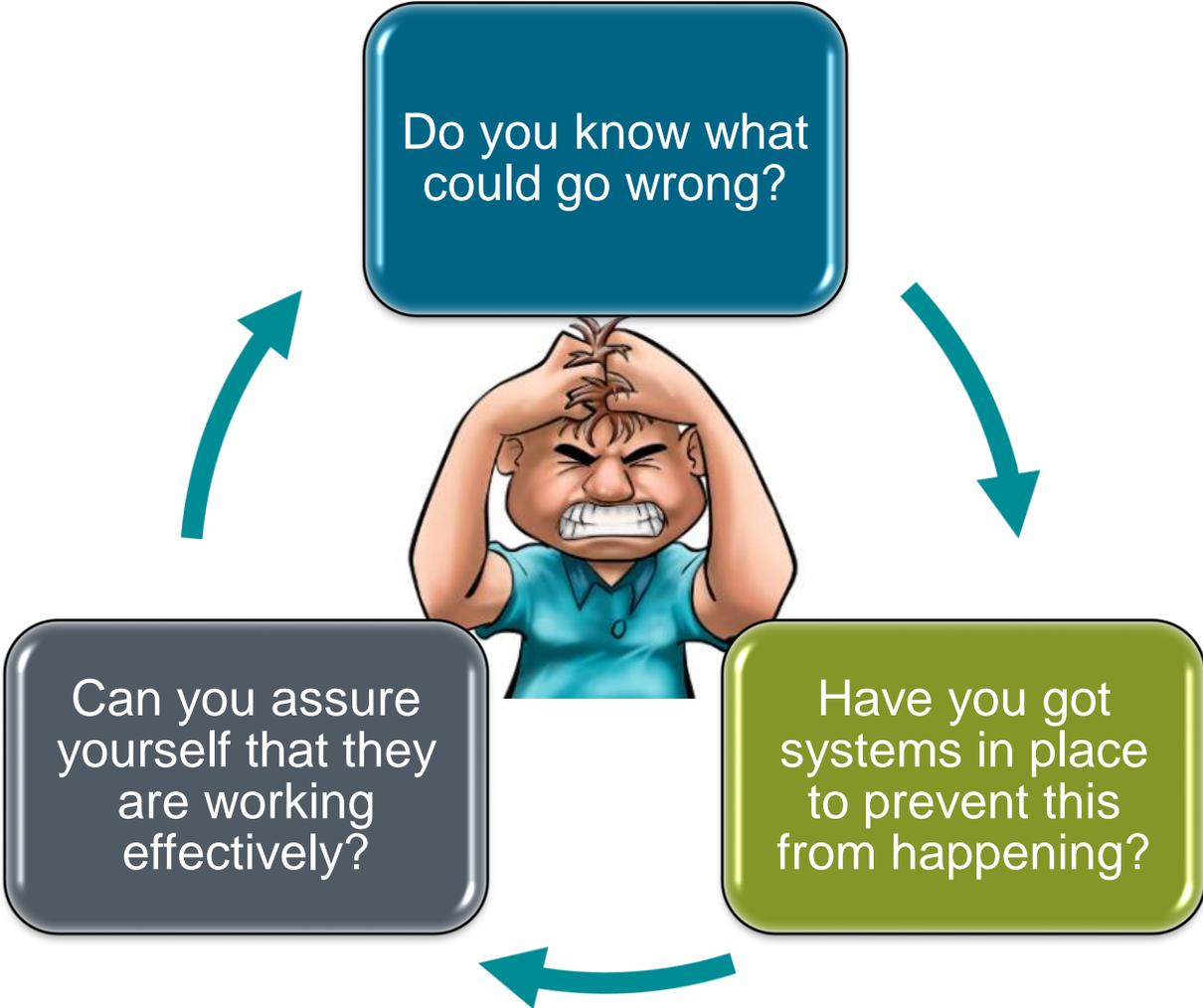
1. Framework ensures and demonstrates that they are managing risk effectively internally, to customers and the regulator.
2. Ensures a complete and thorough approach – thinking done up-front (once!) involving all the right people.
3. Provides a blueprint and template for specific projects ensuring consistent approach.
4. Reduces cost; majority of work done up-front - application limited to project specific tailoring.
5. Captures experience and lessons learned centrally providing a live basis of safety.
6. Approach applicable to any replicated project.

Benefits?

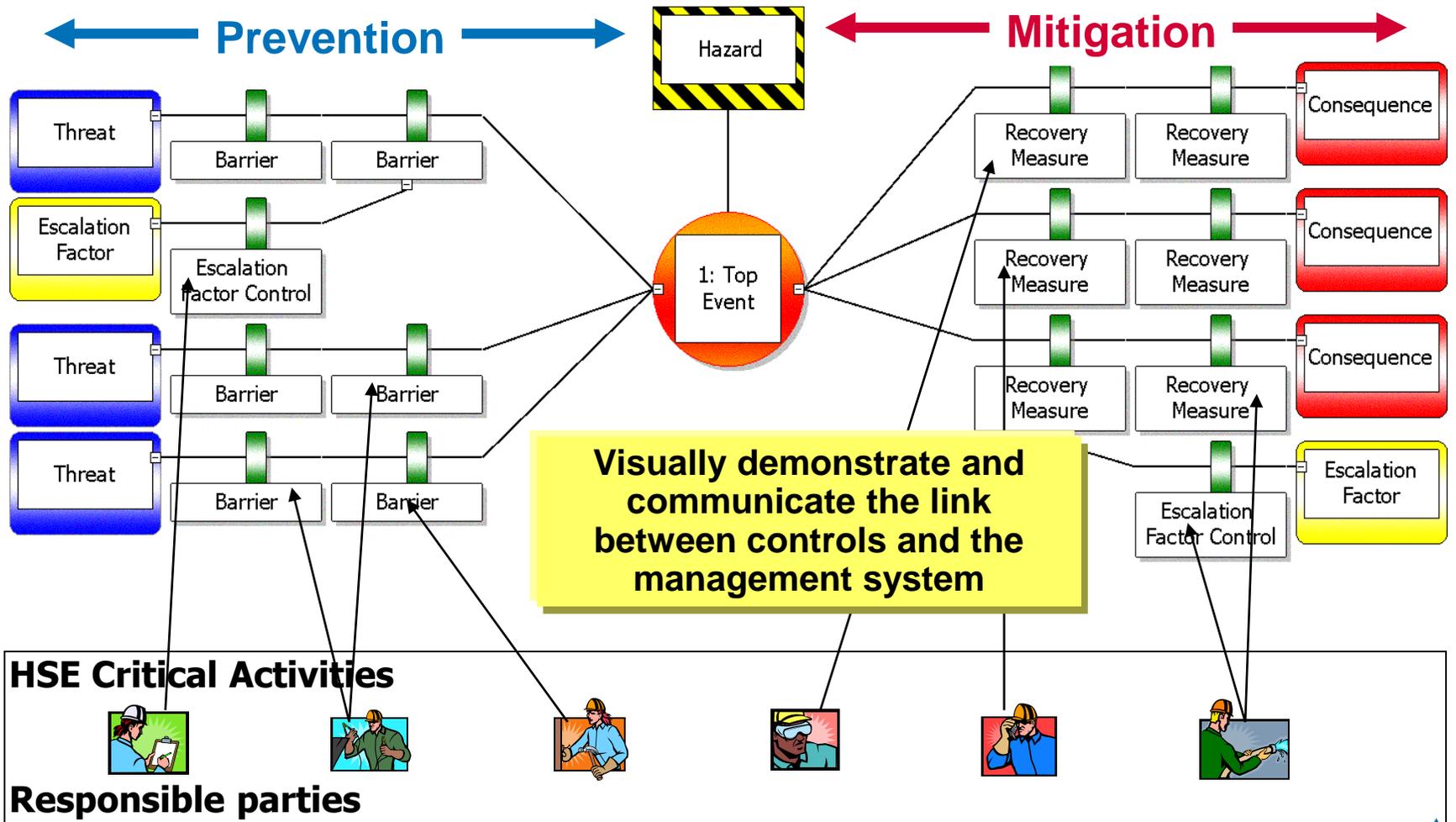
A few ideas & solutions



Process Safety Management



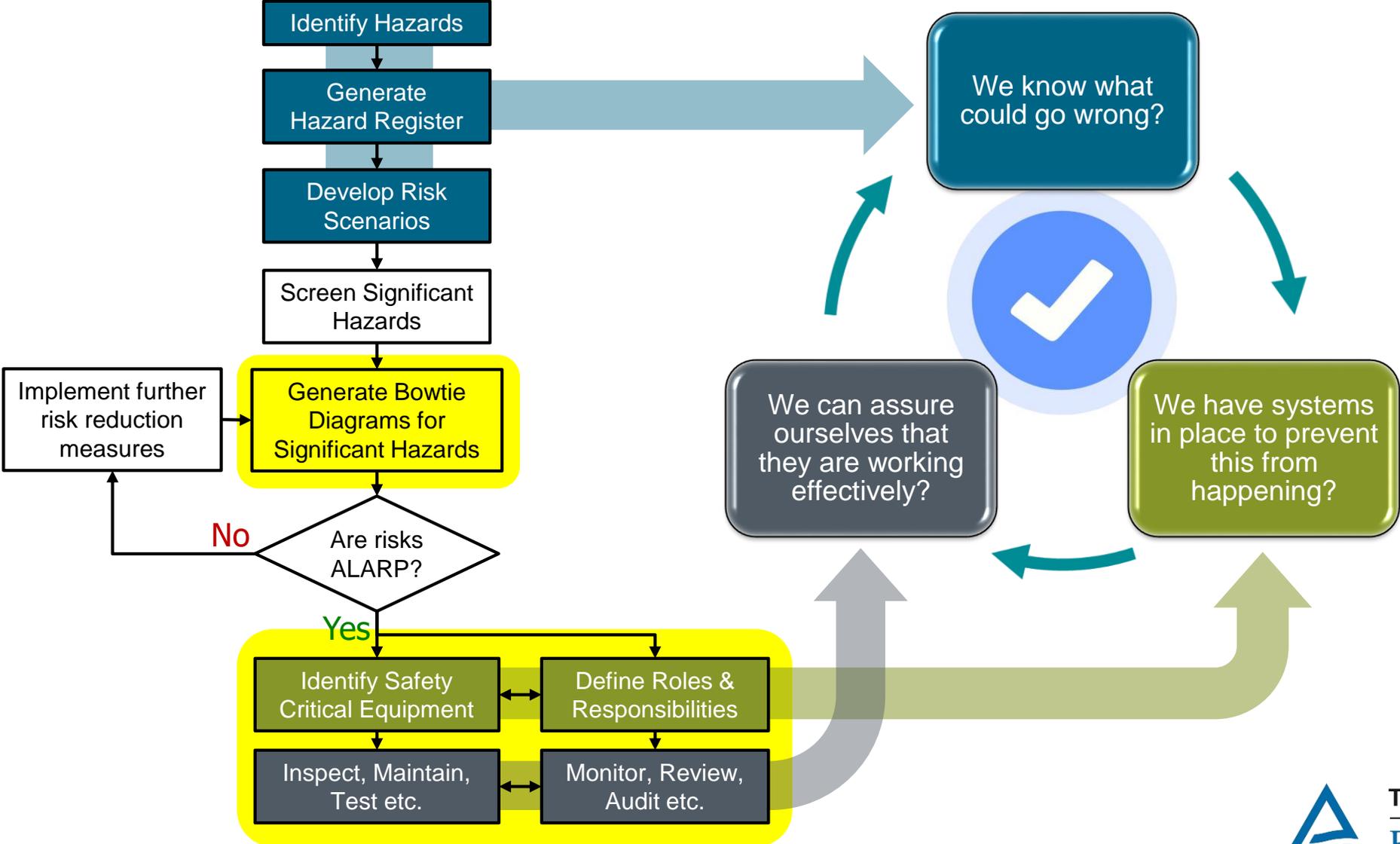
Bow-Tie Methodology



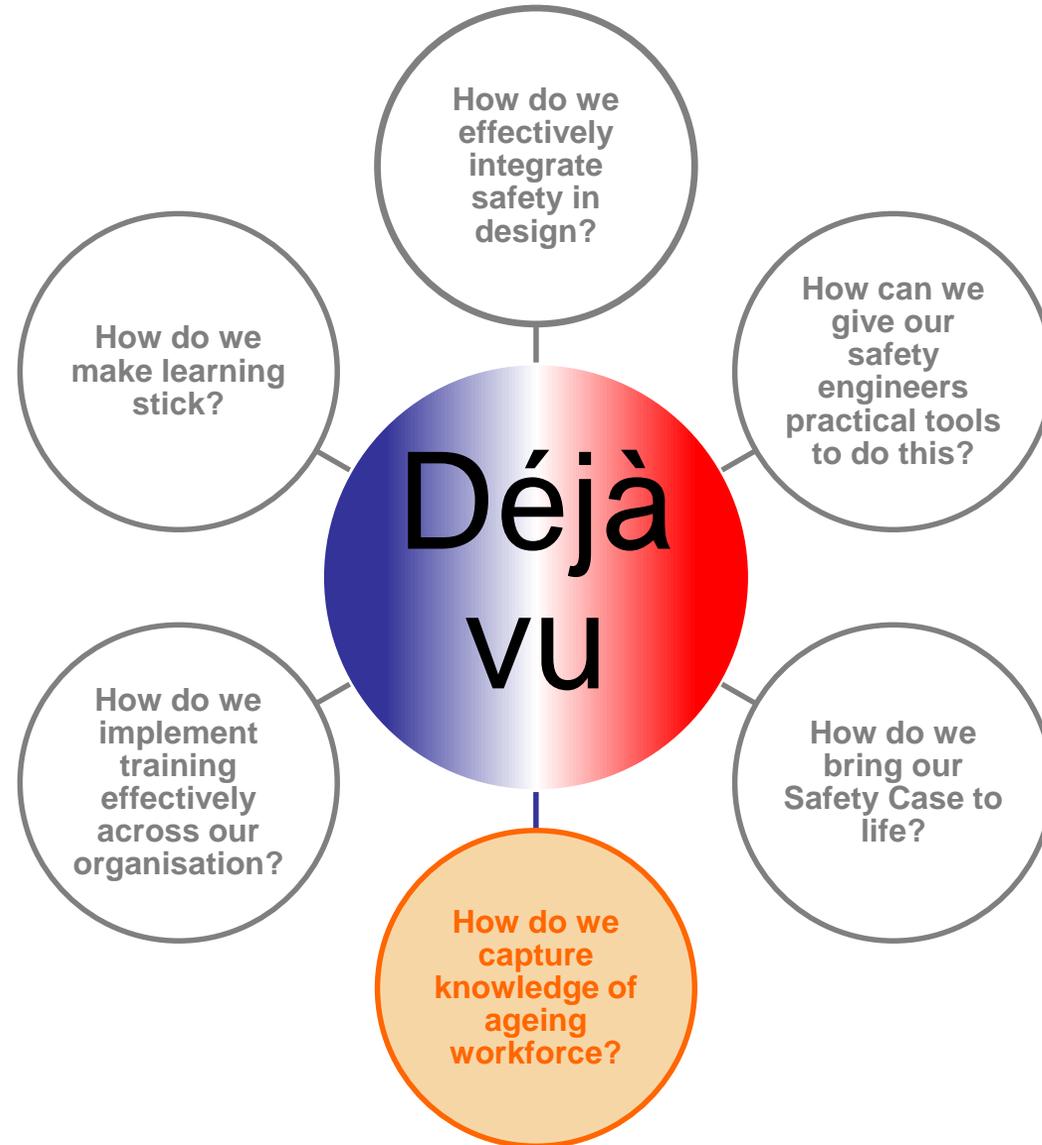
Benefits of Bow-Tie

- Improved understanding
- Greater ownership
- Efficiency gains
- Live “Basis of Safety”

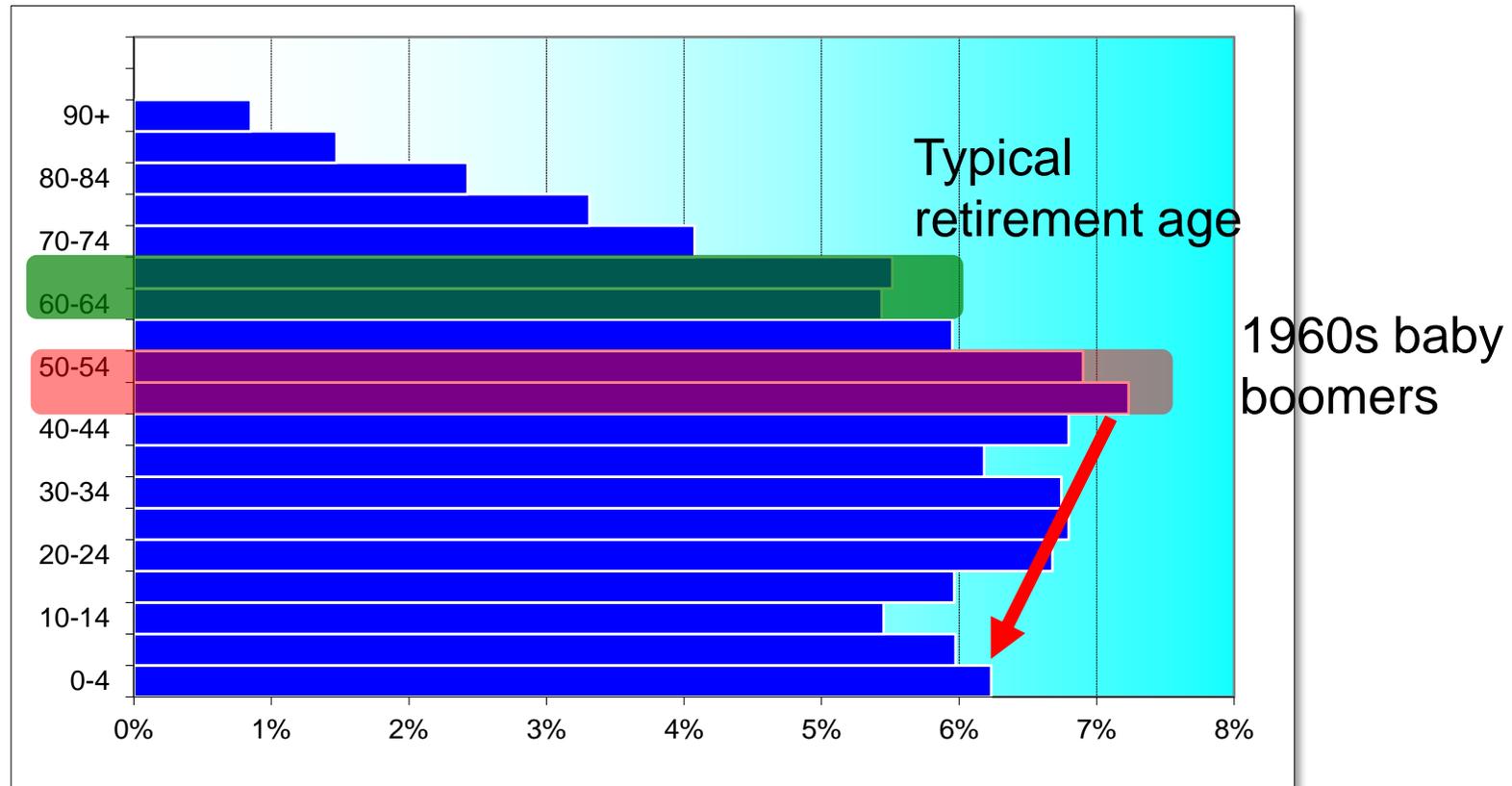
Where does it fit in?



A few ideas & solutions



Ageing Western Workforce



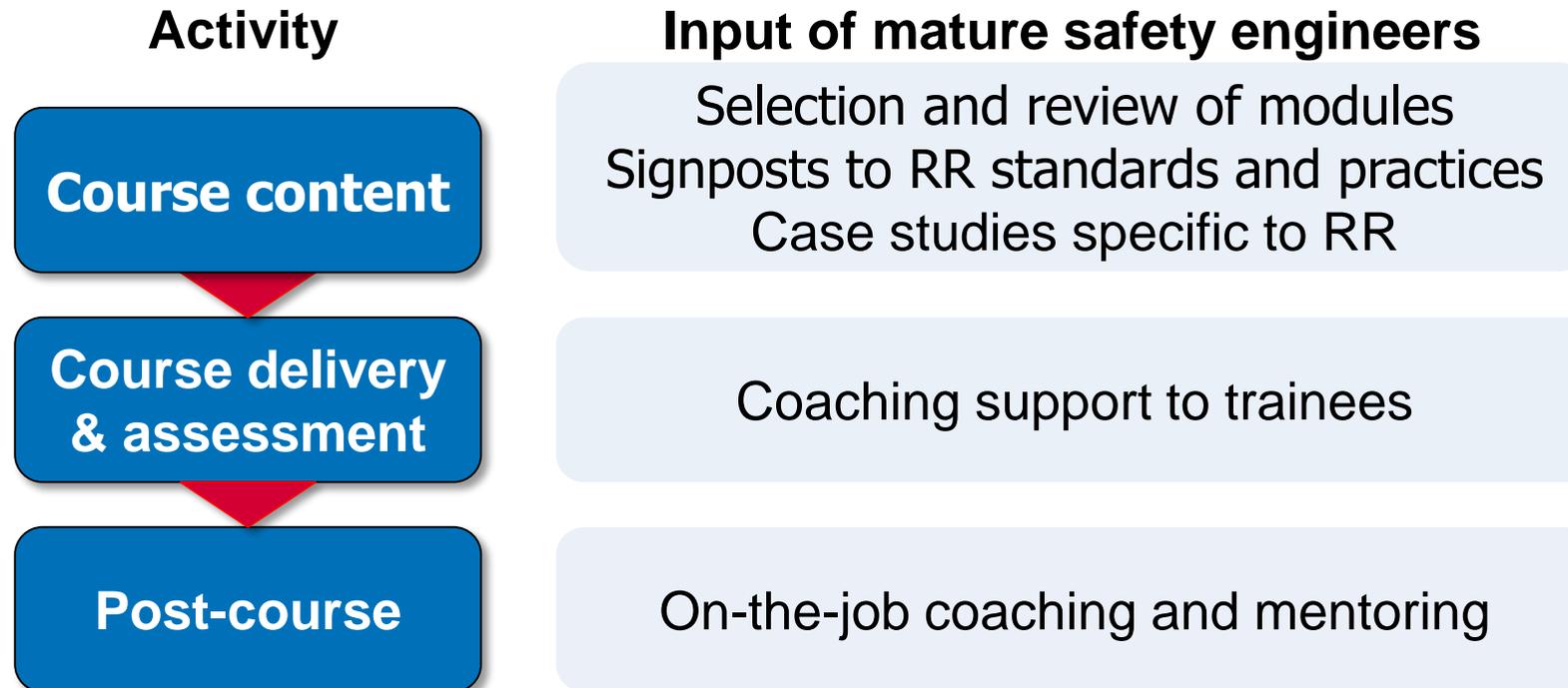
United Kingdom, 2014, source www.ons.gov.uk

Disproportionate number of experienced and skilled workers retiring in next 5-10 years => specific strategies required for knowledge transfer

Case study: Rolls-Royce Submarines

Problem: How to capture safety knowledge of mature safety engineers and pass on to new younger safety engineers?

Solution: Customised MSc in Risk and Safety Management

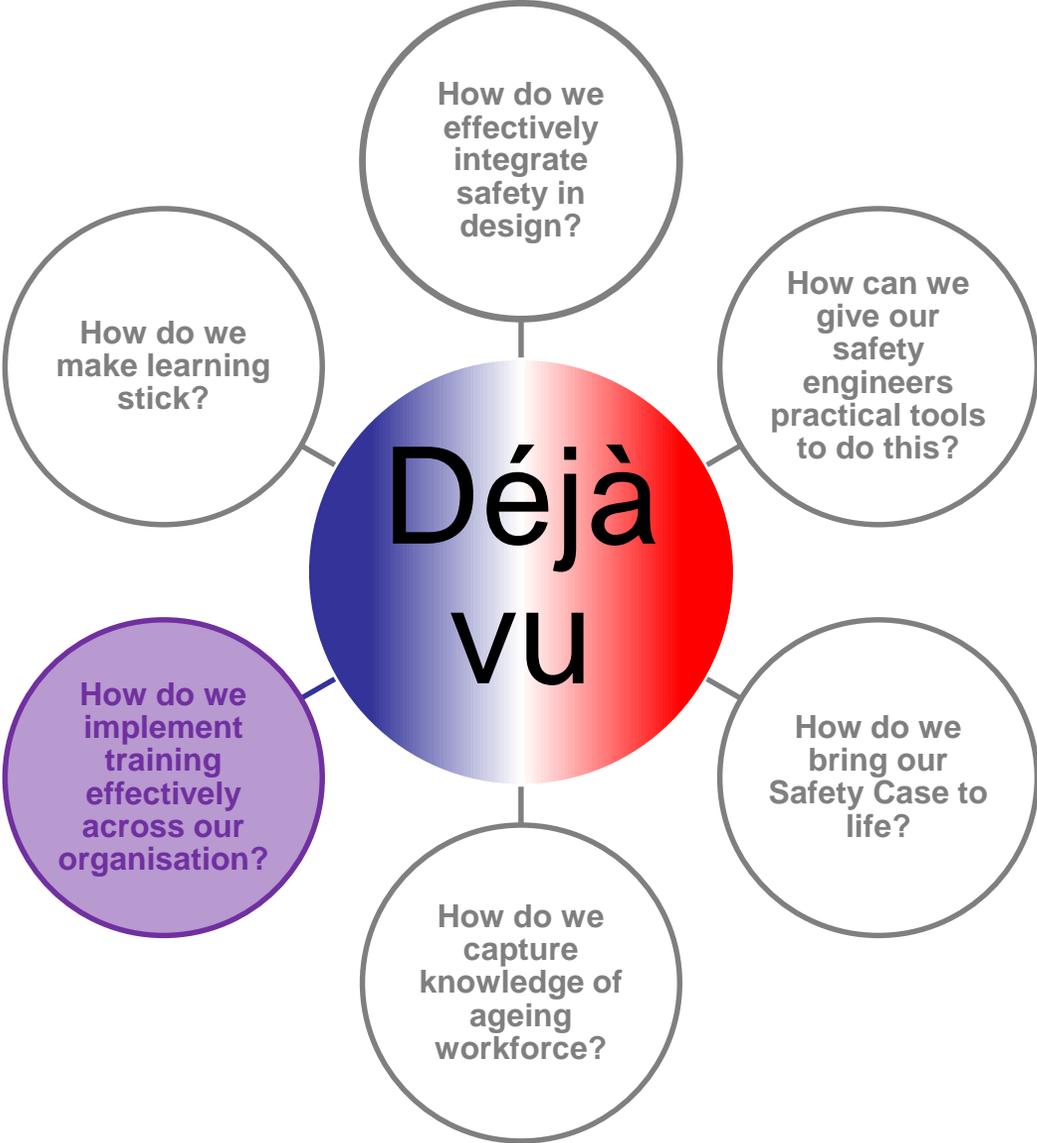


Benefits

- 100% success rate (2 passes, 3 merits, 11 distinctions)
- Course materials captured company knowledge in structured programme
- Trainees able to relate theory to practical applications of day job
- Subsequent performance reviews revealed trainees outperformed peers in day job



A few ideas & solutions

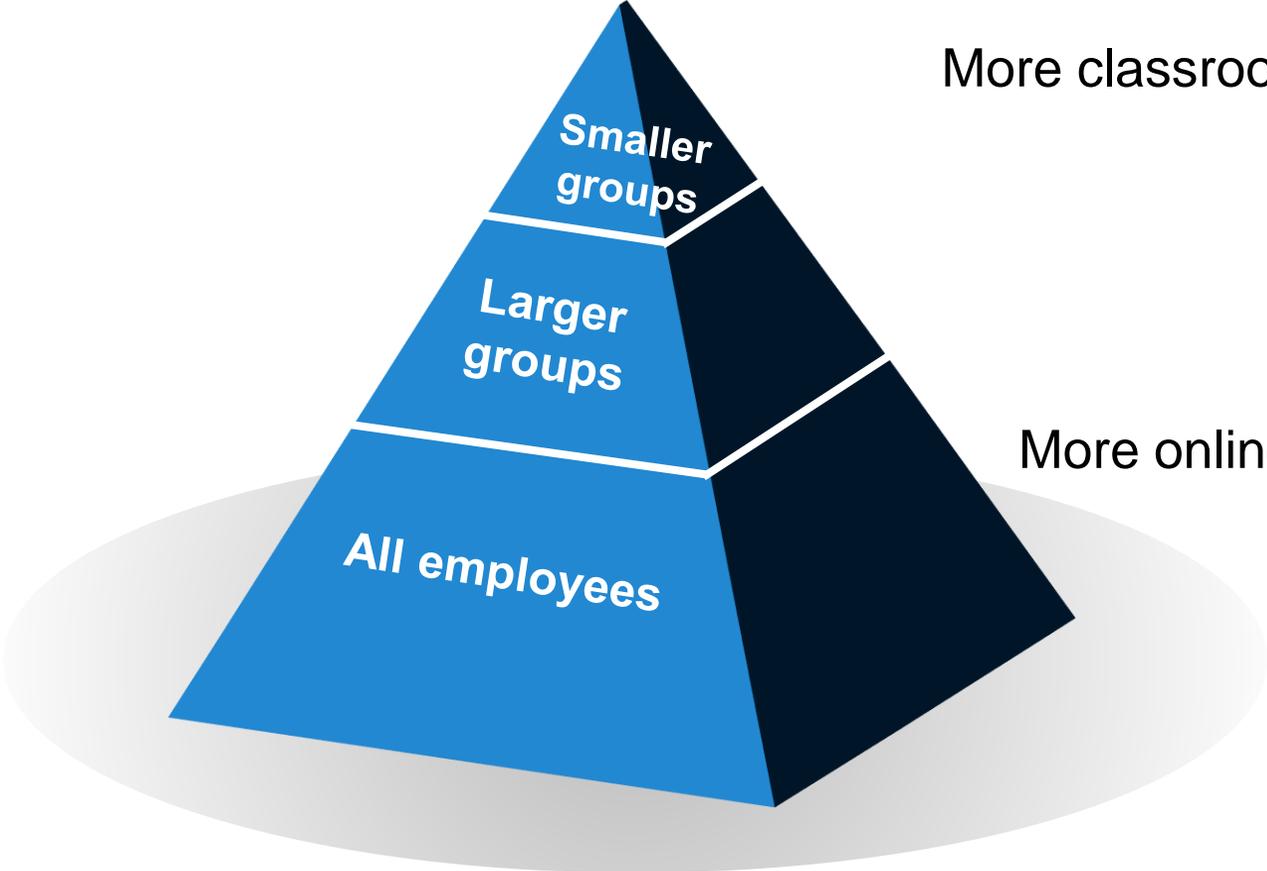


Methods of Delivery & Assessment

Audience

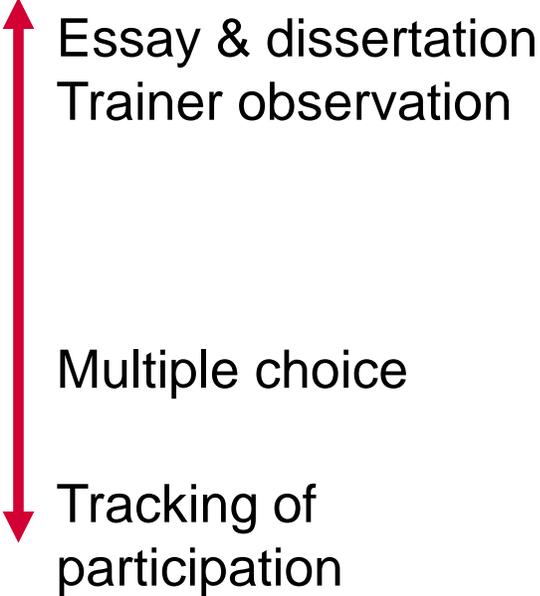
Delivery

Assessment



More classroom based

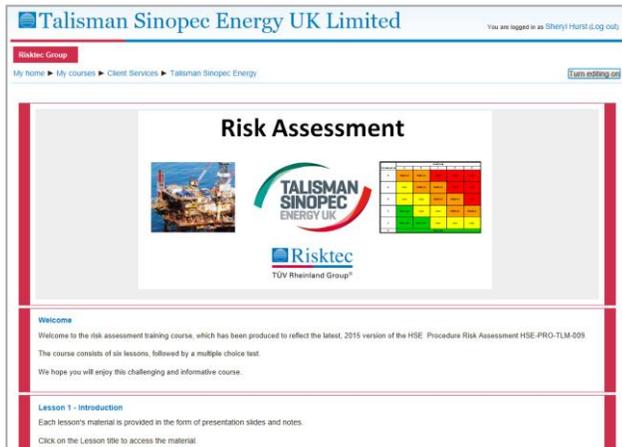
More online or CBT



Case Study: Talisman-SINOPEC Energy UK

Problem: How to make 4,000 workers aware of importance of new Risk Assessment Matrix and how to help 250 supervisors use it correctly?

Solution: Blended learning (online + classroom)



Online 1 hour awareness training for 4,000 workers (client secure area on Risktec Online)

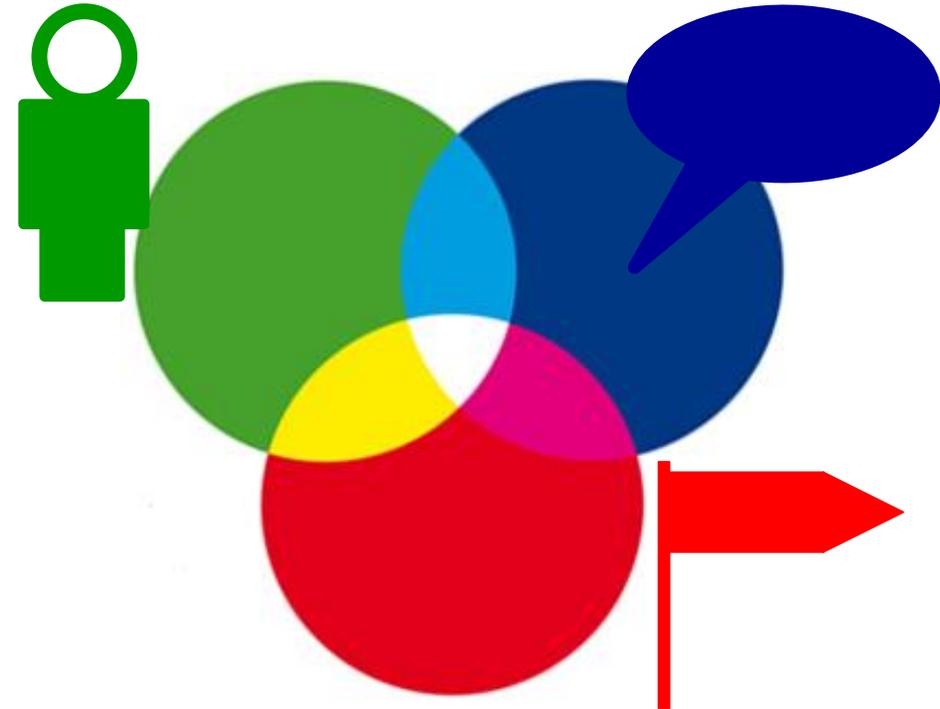


Classroom 1 day training for 250 supervisors in groups of 20, with individual and group activities

Testing by multiple choice questions

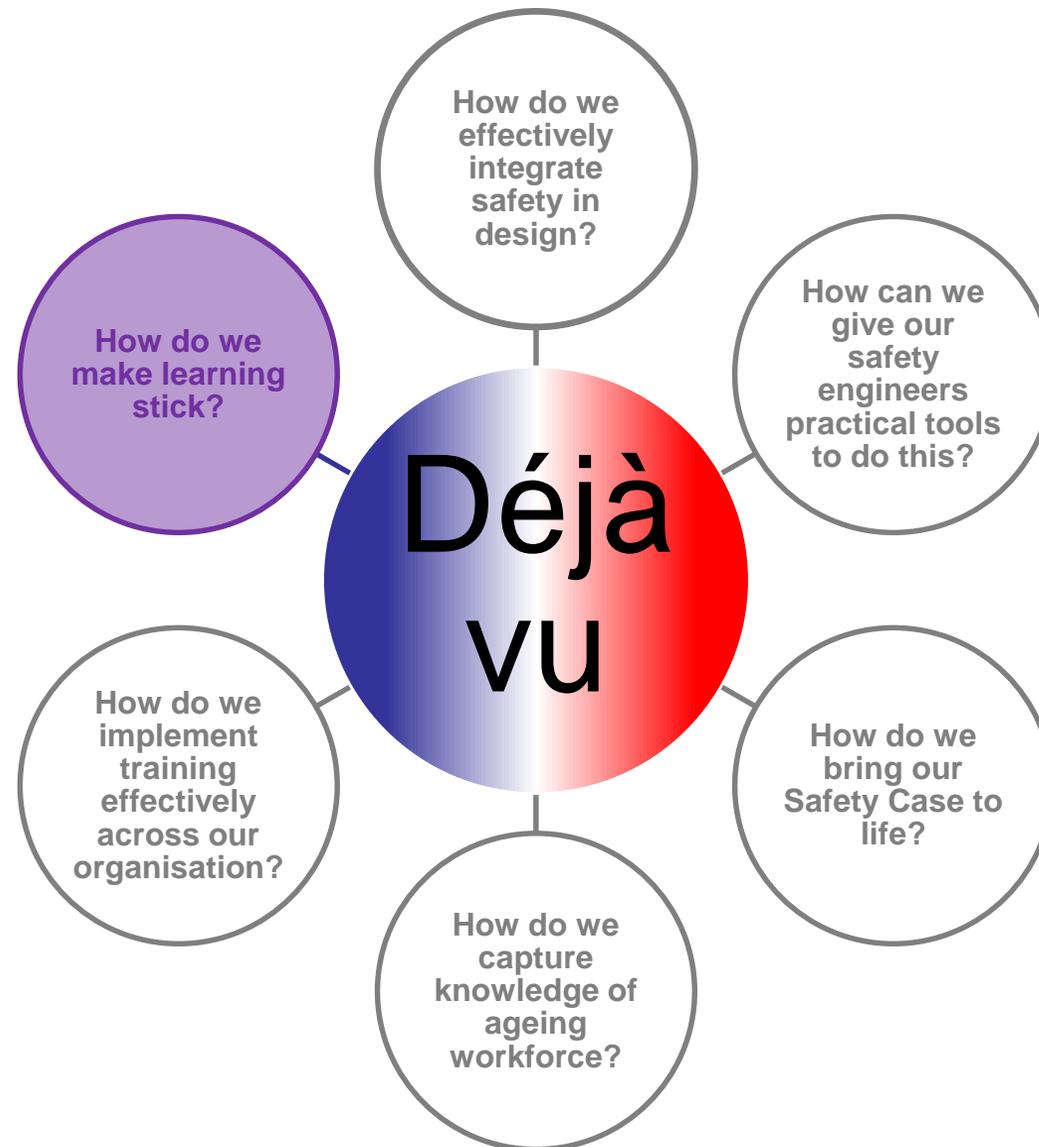
Benefits

- Different audiences get:
 - right message for them
 - appropriate delivery method
 - appropriate level of assessment to confirm message understood
- Very cost-effective
- More consistent risk assessment and decision-making in workplace



Right person, right message, right way

A few ideas & solutions





TÜVRheinland®
Risktec

Game
Based
Learning

GAME BASED LEARNING

A NEW TAKE | MAKING LEARNING
ON TRAINING | **LAST LONGER**



TEAM BASED

30-60
MINS

AGE
2-102

INTERACTIVE



EFFECTIVE



FUN



GAME BASED LEARNING

Q: WHAT HAPPENS WHEN TRAINEES APPLY THEIR **PROBLEM SOLVING ABILITY** TO GAMES WHICH REFLECT THE **KEY CHALLENGES** IN BUSINESS?

A: YOUR WORKFORCE DEVELOPS A **PERSONAL UNDERSTANDING** OF THE SUBJECT AND HAVE **HIGHER RETENTION RATE** OF THE LEARNING OBJECTIVE.

PEOPLE GENERALLY REMEMBER...

10% OF WHAT THEY **READ**

READ

20% OF WHAT THEY **HEAR**

HEAR

30% OF WHAT THEY **SEE**

VIEW IMAGES

WATCH VIDEOS

50% OF WHAT THEY **SEE AND HEAR**

ATTEND EXHIBITS/SITES

WATCH A DEMONSTRATION

70% OF WHAT THEY **SAY AND WRITE**

PARTICIPATE IN HANDS-ON-WORKSHOPS

DESIGN COLLABORATIVE LESSONS

90% OF WHAT THEY **DO**

SIMULATE, MODEL, OR EXPERIENCE A LESSON

GBL

DESIGN/PERFORM A PRESENTATION - "DO THE REAL THING"

For Grown-Ups: Game based learning takes the concepts you wish to communicate out of power point and places them tangibly in front of the trainee. The games re-inforce the learning by using an analogy to bring a traditionally technical subject and ground it in the real world – making the training accessible to all personnel across an organisation. Through the game cause and effect can be played out in a safe environment allowing an appreciation of how the analogy would apply to everyday operations. By providing an interactive, fun, hands on experience research indicates retention of the learning outcomes are higher versus traditional methods as found by Edgar Dale's research and development of his "Cone of Experience".



Example Games



THEME 1

“Layers of Protection”

“Operating equipment before understanding the safety critical aspects of operation and before verifying the safety critical ‘lines of defence’ are in place and functional”.



TÜVRheinland®
Risktec

Game
Based
Learning


TEAM BASED

 30-60
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TIPPING POINT

CAN YOU AVOID COLLAPSE?



DEFENCE IN DEPTH



Everyday operational issues can be tough on your barriers against failure. Put your **judgement** and **technical skills** to the test to manage your facility and keep it from *collapse*.

For Grown Ups – This game illustrates the concept of Defence in Depth against Major Accident Hazards through a barrier analogy. The players will be given scenarios that will necessitate the loss of safety barriers and gain a tangible understanding of the effects eroding these have on the stability and integrity of operations.



Example games



THEME 2

“Functional Safety Critical Equipment”

“Starting or operating equipment when safety critical instrumentation is bypassed, out of calibration or out of service”.



TÜVRheinland®
Risktec

Game
Based
Learning



TEAM BASED



30-60
MINS



AGE
2-102



Can you fly without...?

SAFETY CRITICAL ELEMENTS

1 GPS \$4m	8 Co-pilot \$3m	14 Lifejackets \$2m	20 First Class Beds \$3m	24 Disco \$5m	30 Safety Video and Instructions \$2m	36 Window blinds \$4m
2 Seatbelts \$1m	9 Auto-pilot \$2m	15 Meal Trolley \$4m	21 Bar \$5m	25 Personal TV's \$3m	31 Drinks trolley \$5m	37 Pillows and Blankets \$3m
3 Instrument Landing Capability \$3m	10 Seats \$4m	16 Cockpit Oxygen System \$4m		26 Pool table \$2m	32 Navigation Chart \$2m	38 Black box \$2m
4 Fire Fighting System \$4m						39 Ground Proximity Warning System \$4m
5 Cockpit Head Up Display \$3m	11 Tannoy \$2m	17 Air Stewards \$5m		27 Games Console \$3m	33 Navigation Databases \$4m	40 Traffic Collision and Avoidance System \$3m
6 Engines 3 & 4 \$4m	12 Passenger Oxygen System \$3m	18 Flight Deck Automatic Door Locking \$2m	22 Toilets \$5m	28 Self-tinting Windows \$2m	34 Air to ground radio \$3m	41 Navigation lights \$3m
7 Captain \$4m	13 Escape slides \$2m	19 Brakes \$2m	23 Parachutes \$3m	29 Doors \$3m	35 Cockpit instrumentation \$5m	42 Ground Proximity Warning System \$4m

SPEC YOUR OWN
PRIVATE JET
FOR THE HOLIDAY
OF A **LIFETIME!**

A lottery win means you can afford it all – disco, pool table, the works... but when **reality bites** can you afford what you *really need* to fly at all?

For Grown Ups – This game illustrates the concept of safety critical elements in the context of an aeroplane's systems. The players will have to use their judgement to identify those components available for selection which are key to the safety of the flight. This mirrors the identification and justification of safety critical elements essential to the prevention, control and mitigation of Major Accident Hazards.



Benefits of Game Based Learning

1. A novel, engaging mechanism for learning.
2. Significantly improved knowledge retention rates.
3. Increases impact of training by linking a fun activity to a serious issue or concept – makes it enjoyable and memorable.
4. Refreshing alternative to conventional training.
5. Readily tailored to suit different issues/concepts - can easily link issue/concept to a game either literally or metaphorically.

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Questions



Thank you for your attention

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