

Managing Operational Risk

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Managing Risk Through the Asset Lifecycle - UKOPA/13/019



Managing Operational Risk

- What are the risks?
- Project life cycle stage
- Operate life cycle stage
- What does it mean to achieve ALARP?
- How do we know if Operating risk is ALARP?
- BG Asset Integrity “model”
- Cumulative Operational Risk Assessment process
- Behaviours
- Software tool

What risks are we talking about?

- The focus is on risks associated with Major Accident Hazards
- These events can have catastrophic consequences in terms of:
 - Loss of life
 - Environmental damage
 - Loss of assets
 - Reputational damage

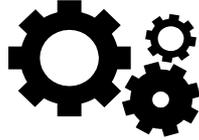


At the Project stage

- Objective is to design and build a facility that is capable of operation with risks As Low As Reasonably Practicable (ALARP). We need:
 - All Major Hazards/Environmental Events identified and risks assessed
 - Relevant codes, standards and industry best practice applied
 - Cost-benefit analysis to select additional risk reduction measures
 - Safety and Environmental Critical Barriers identified and designed to deliver the risk reduction that is required (Performance Standards)
 - With Independent Verification of Barriers throughout the life cycle
 - Clearly defined safe operating envelope with robust operating procedures
 - Operations personnel trained and competence assured
 - Suitable HSE Management System in place
- BG Facility Safety Cases document the above
 - provides a justification (makes a claim) that the facility risks will be ALARP

Barriers

Plant



e.g. Leak & Fire Detection

People

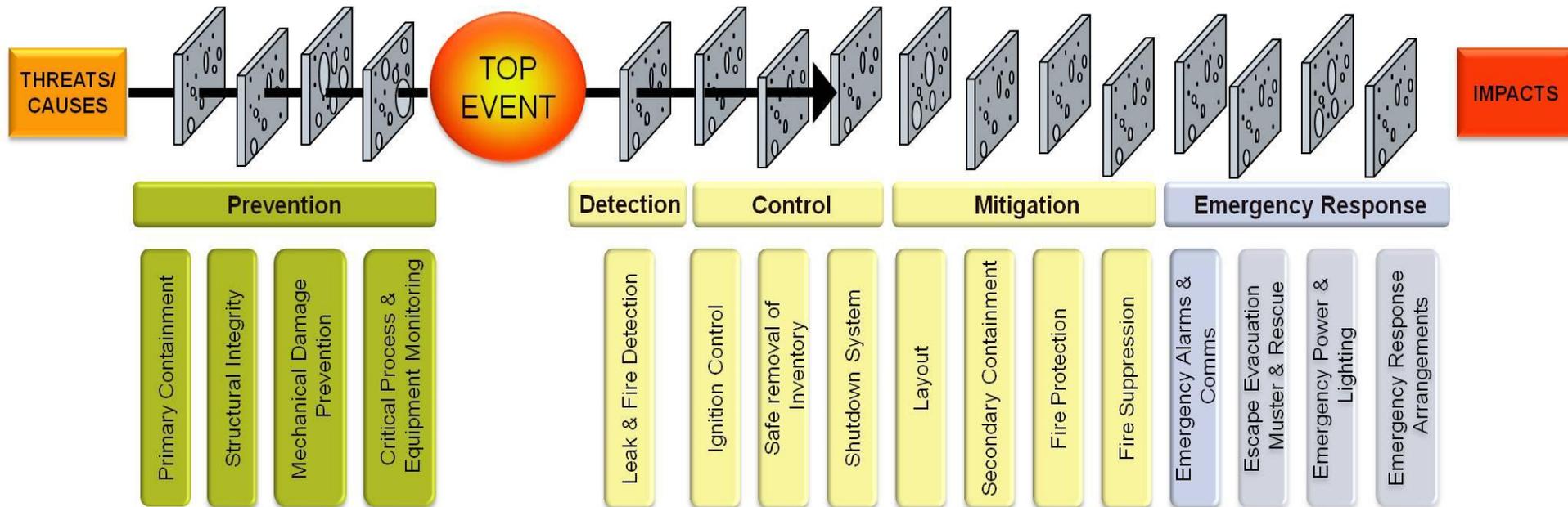


e.g. Training & Competence

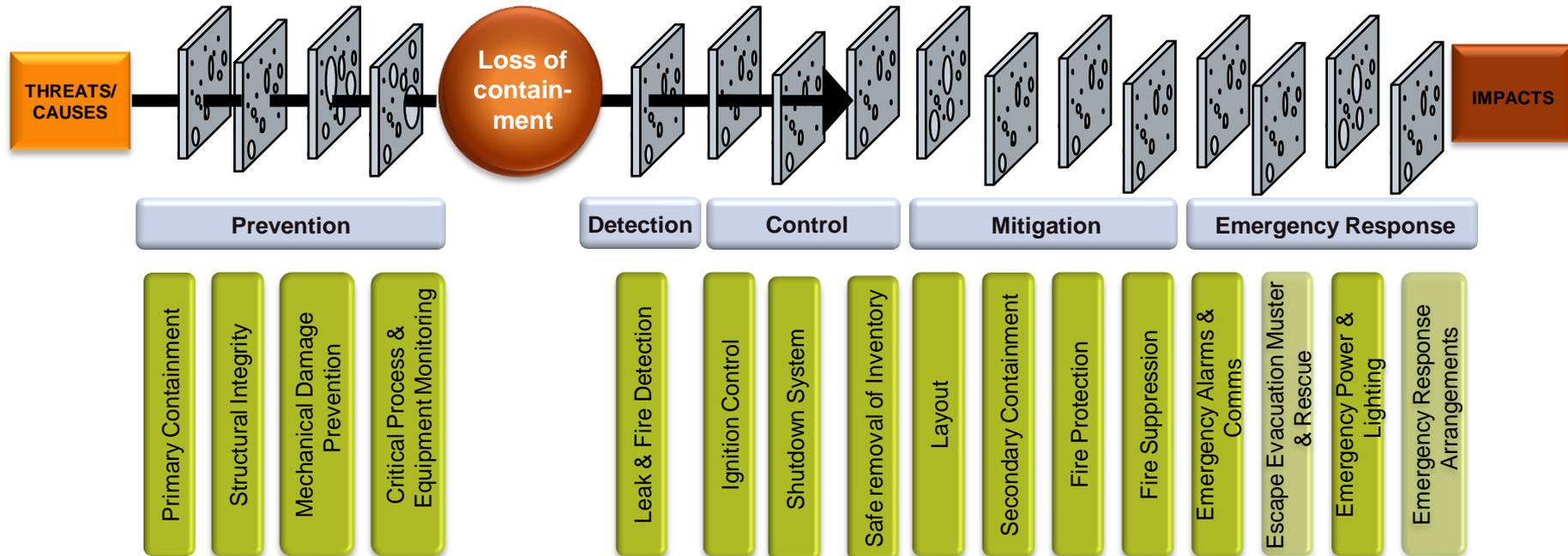
Processes



e.g. Safe Working Practices

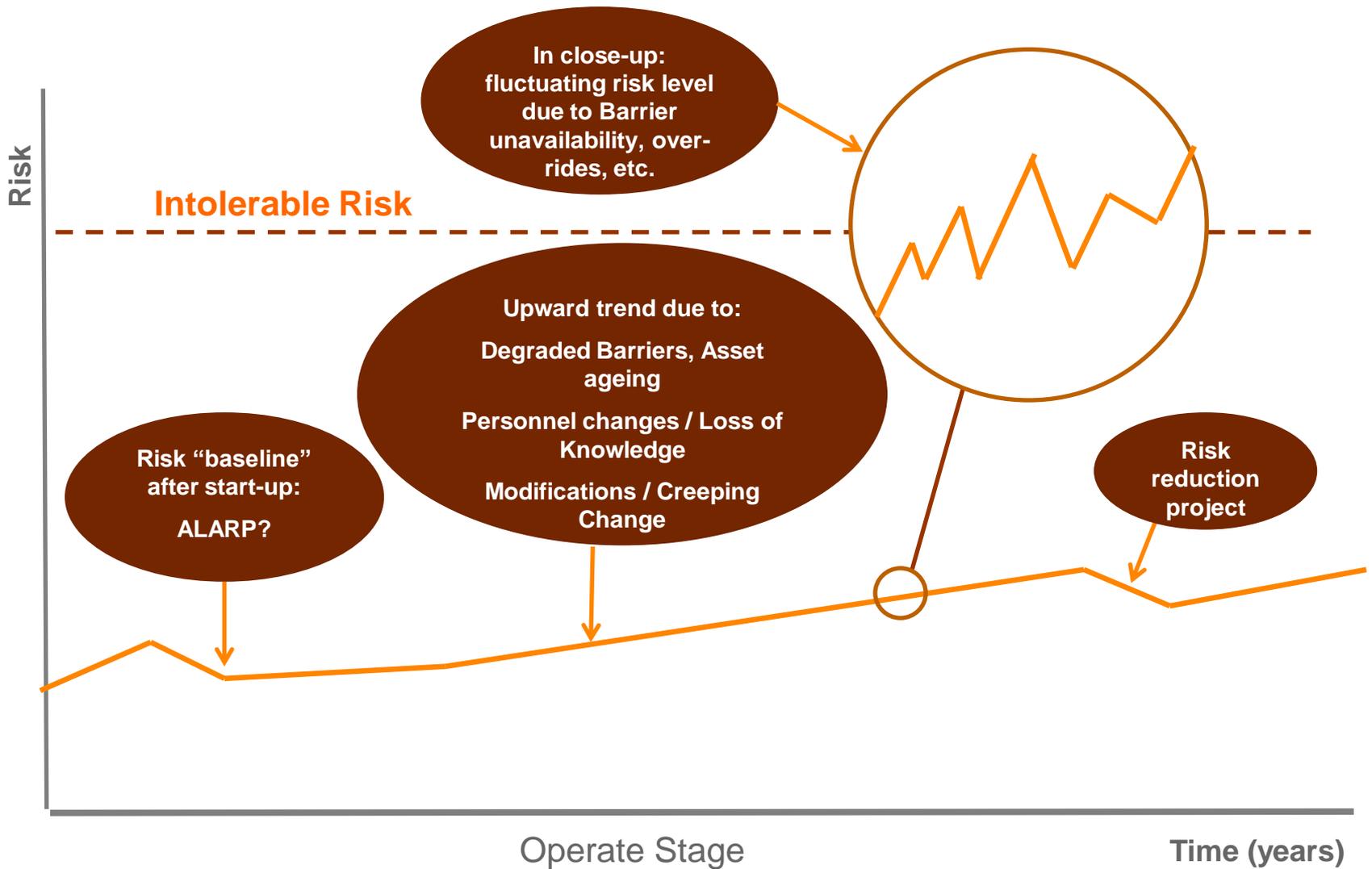


Is this what ALARP looks like?

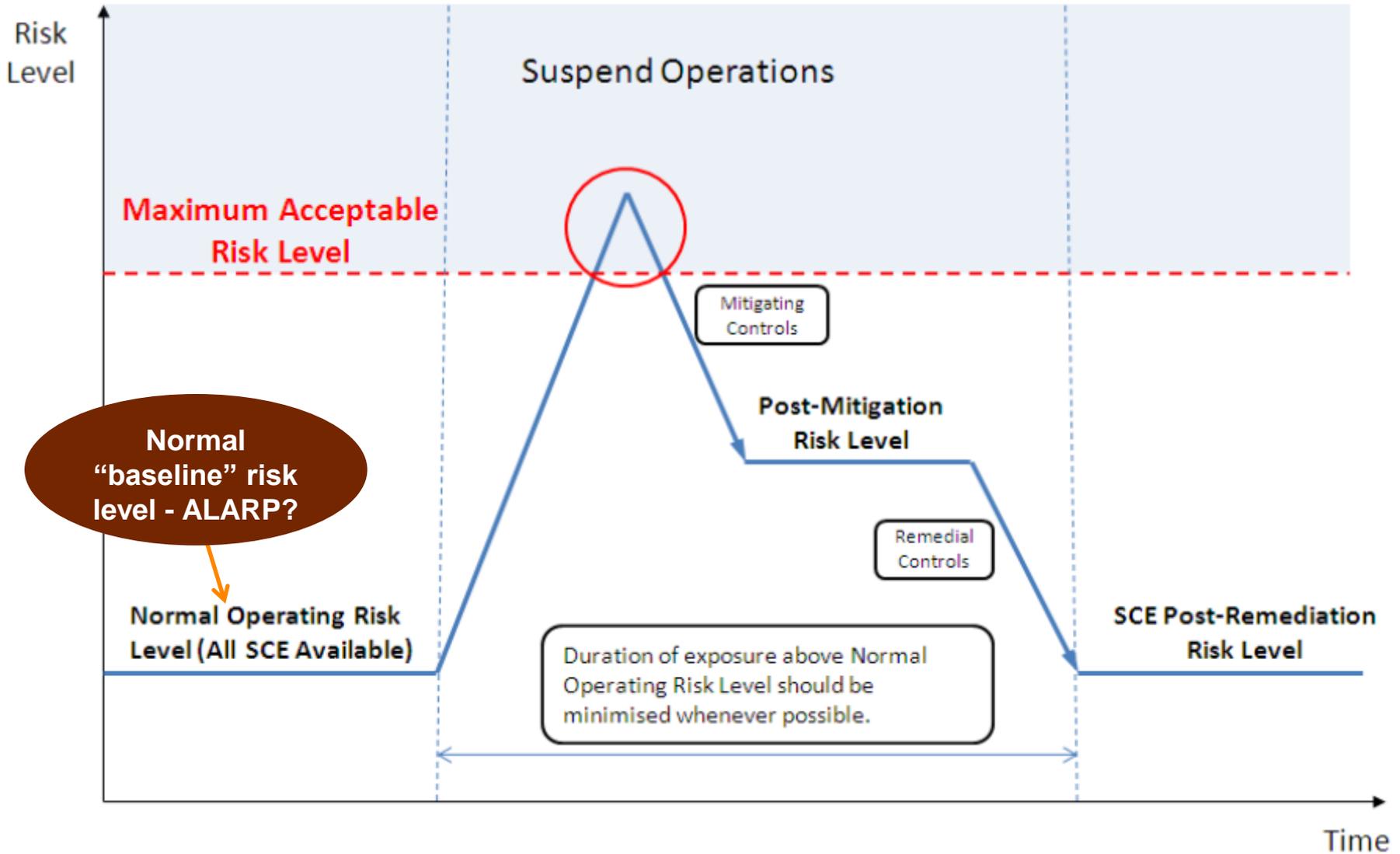


Only with all barriers fully effective is the facility operational (major hazard) risk at a level that is As Low As Reasonably Practicable

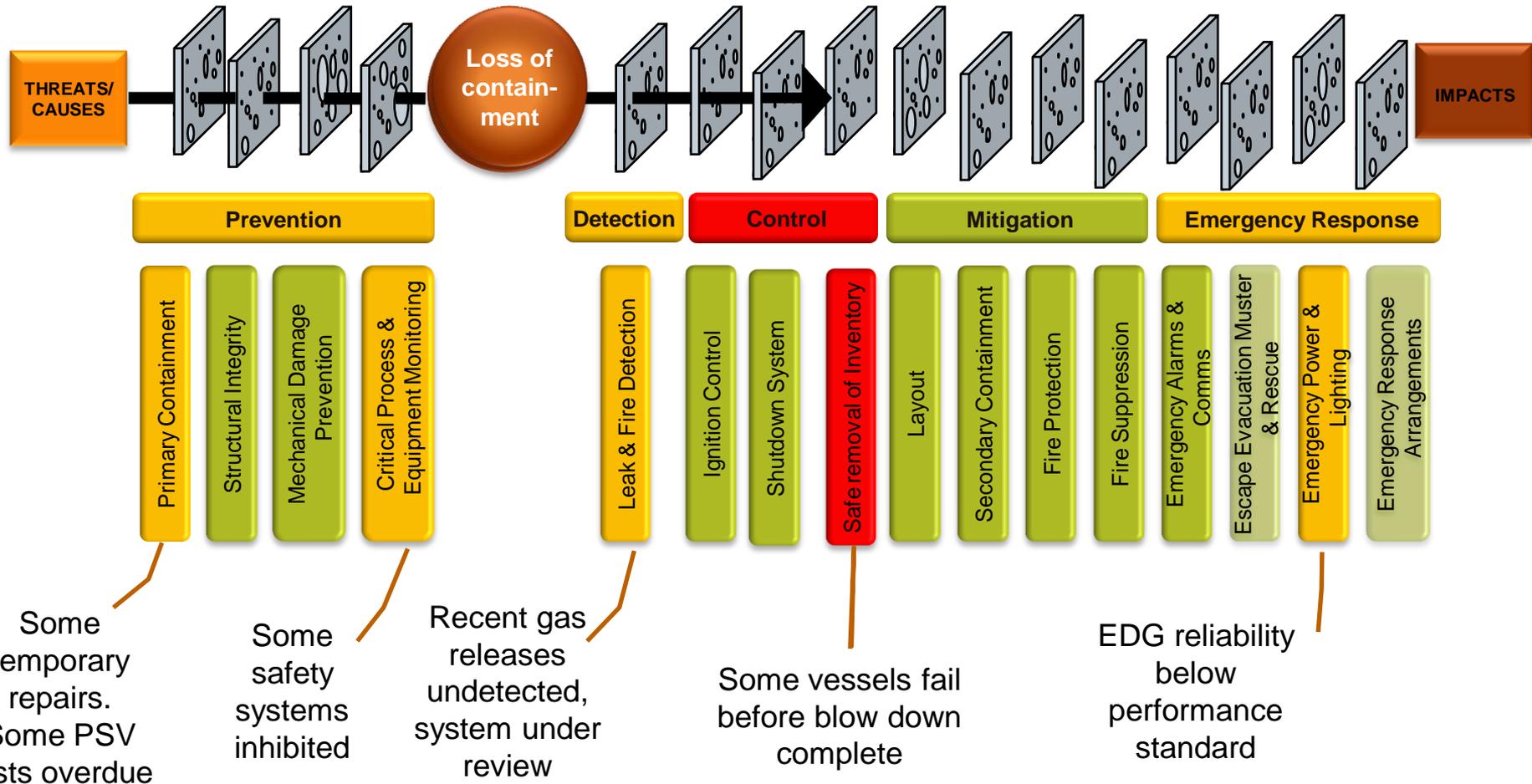
But when we start to Operate.....



Operational Risk Assessment



“Real world” Barrier model during operation



NOTE – Colours above are purely demonstrative and intended to reflect the perceived or actual health of barriers when called upon in genuine demand

How do we know if Operating Risk is ALARP?

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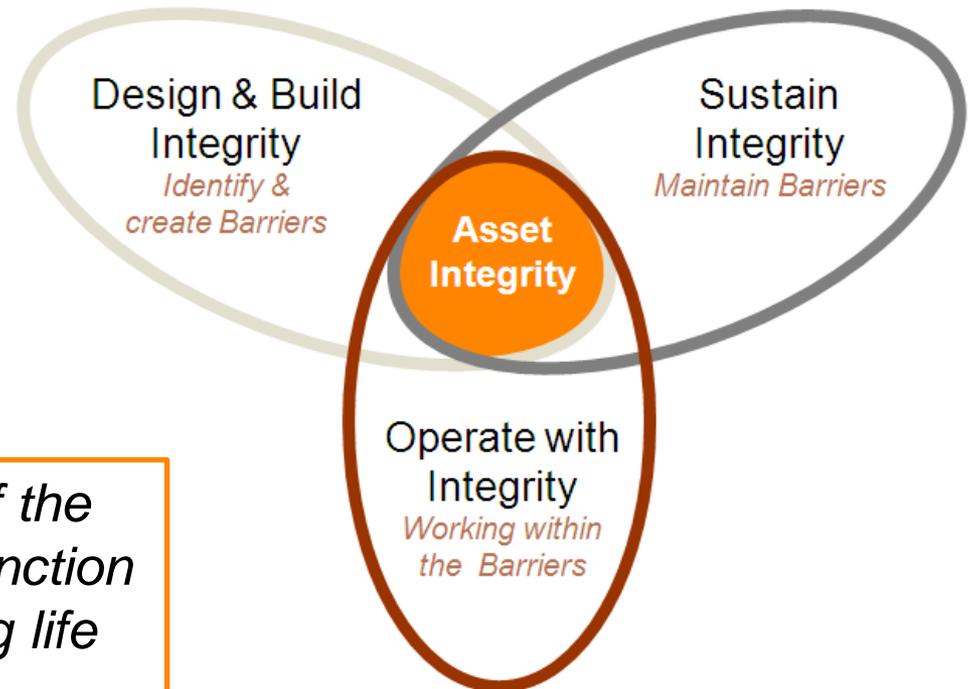


- How do we gain assurance that these risks are under control?
- How do we ensure risks stay ALARP – every day?
- How do we communicate the risk exposure to those accountable – the Senior Management?



Managing Operational Risk – focus areas

- Objective is to maintain the risk of a major hazard event associated with the operation of our facilities as low as reasonably practicable
- Requires focus in 3 areas:
 - Design and build
 - Sustain integrity
 - Operate with integrity



Asset Integrity is the ability of the asset to perform its required function effectively whilst safeguarding life and the environment

Cumulative Operational Risk – overview

Design and Build Integrity: Periodic Safety Reviews

Safety Case Review,
Process Safety in Design Review

Sustain Integrity: Barrier Assurance Activities

- WMS
- Tech. Authority review
- ICP/IVB input

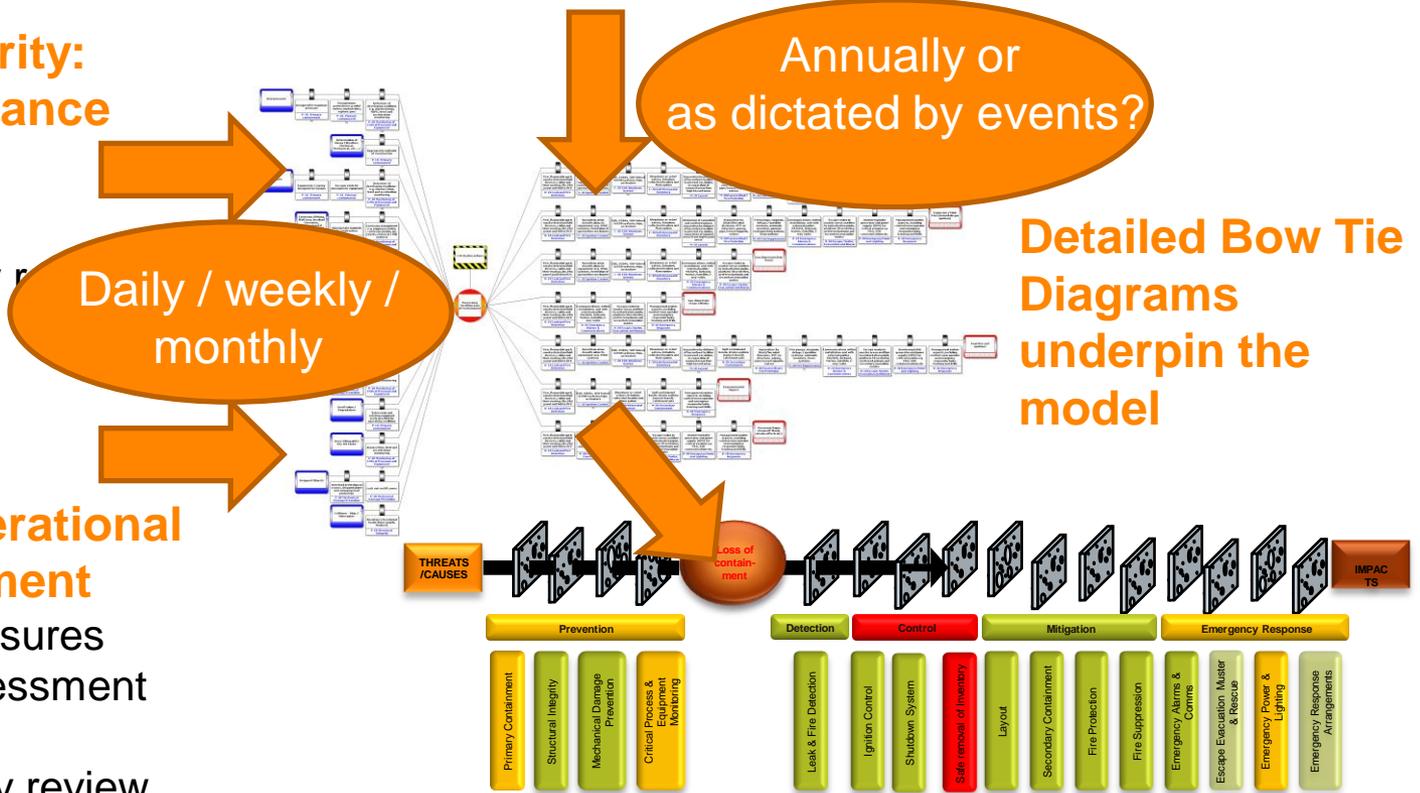
Daily / weekly / monthly

Operate with Integrity: Operational Risk Assessment

- Mitigation measures
- Asset risk assessment teams
- Tech. Authority review

Annually or as dictated by events?

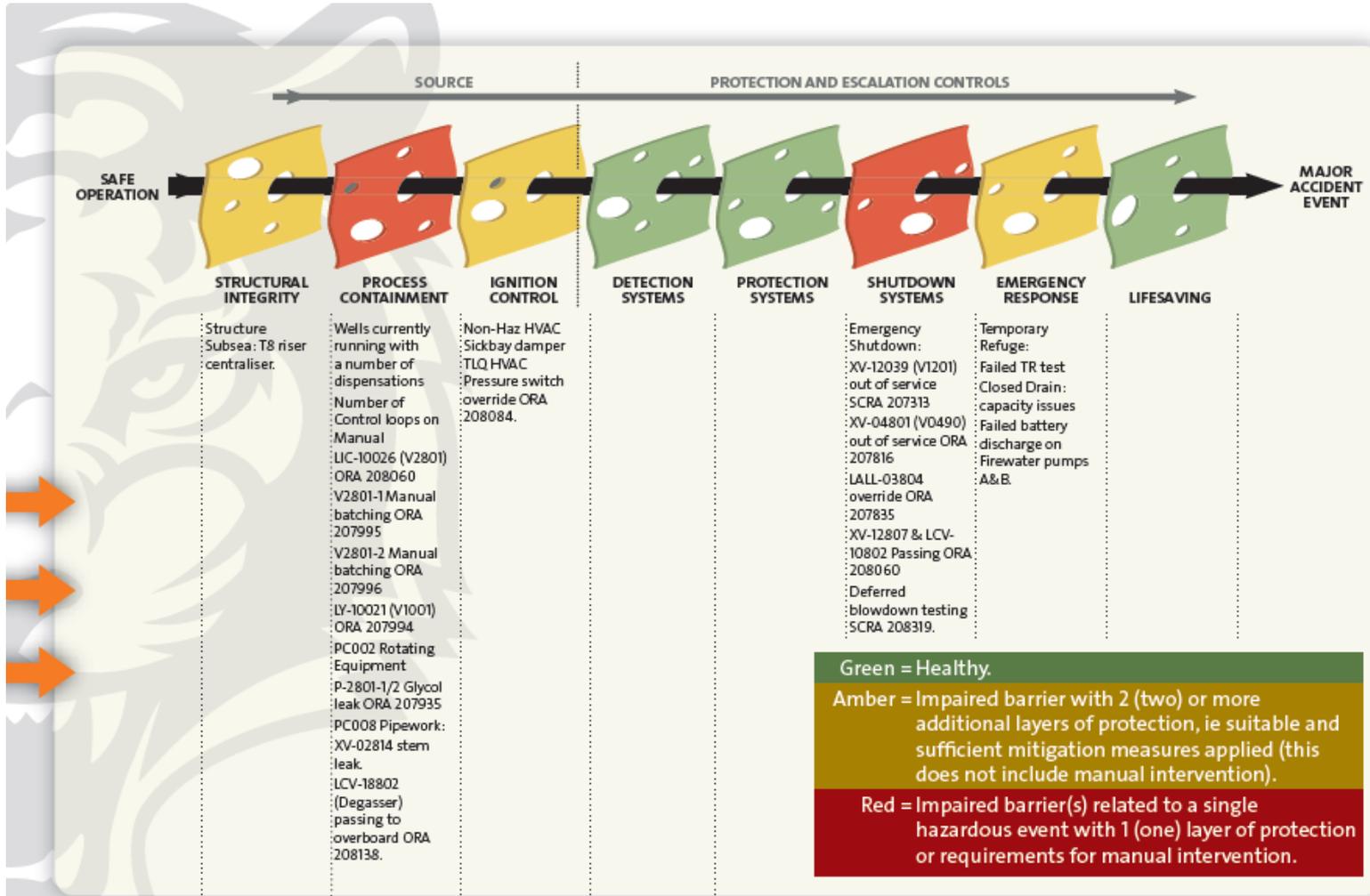
Detailed Bow Tie Diagrams underpin the model



Cumulative risk profile presented on barrier model

- Justification of basis for continued safe operation
- Management review and approval

Manual Version – the beginning



– March 2011 – Lomond elective shutdown

Key features of the process

- Builds on the best practice industry approach for Operational Risk Assessment published in Oil and Gas UK guidelines (Jan 2012)
- Cumulative Risk Assessment of the overall operational risk
 - minor deficiencies in multiple barriers may undermine confidence in the ability to manage risks
- Provides visibility of Operational Risk exposure to Senior Management
 - Management should challenge the status of the cumulative risk model, and test the adequacy and robustness of the risk reduction measures
 - Decision to continue operations is taken by the management team
- Facilitates discussion of factors affecting safe operation

The right behaviour is critical....

- The success of the process hinges on:
 - Quality of input information
 - Open discussions
 - Having the right people involved
 - Challenge of the assessments and mitigations
 - Not “Why is that red?” but “Prove to me that is green!”
 - Ops personnel and management aligned around the same objectives
 - A tool to justify why it is safe, not to justify continued operation
 - OICC (observation, intervention, commitment, contractor management)
 - Can’t intervene on major accidents if you can’t see them coming.....

Software Version – where we are going....

Barrier Model

Safety is the foundation of all my decisions.

Unallocated PS Codes



December 2012						
Mon	Tue	Wed	Thu	Fri	Sat	Sun
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						



Regional Level Display Containing All Sites.



BEACHFIELD

CENTRAL BLOCK

DOLPHIN

HIBISCUS

POINSETTIA



Initial Resid

Initial Resid

Initial Resid

Initial Resid

Initial Resid

	Initial	Resid								
SI Structural Integrity	Green	Green	Green	Green	Red	Yellow	Yellow	Yellow	Red	Yellow
PC Process Containment	Red	Yellow	Yellow	Yellow	Red	Yellow	Green	Green	Green	Green
IC Ignition Control	Green	Green	Green	Green	Yellow	Yellow	Green	Green	Green	Green
DS Detection Systems	Green	Green	Green	Green	Green	Green	Yellow	Green	Green	Green
PS Protection Systems	Green	Green	Yellow	Green	Green	Green	Green	Green	Green	Green
SD Shutdown Systems	Red	Yellow	Green	Green	Green	Green	Green	Green	Green	Green
ER Emergency Response	Yellow	Yellow	Green	Green	Yellow	Green	Yellow	Green	Green	Green
LS Life Saving Systems	Green	Green	Green	Green	Red	Yellow	Green	Green	Red	Yellow