People as Barriers in HSE Risk Management

How drifts into failures happen?

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The business of sustainability

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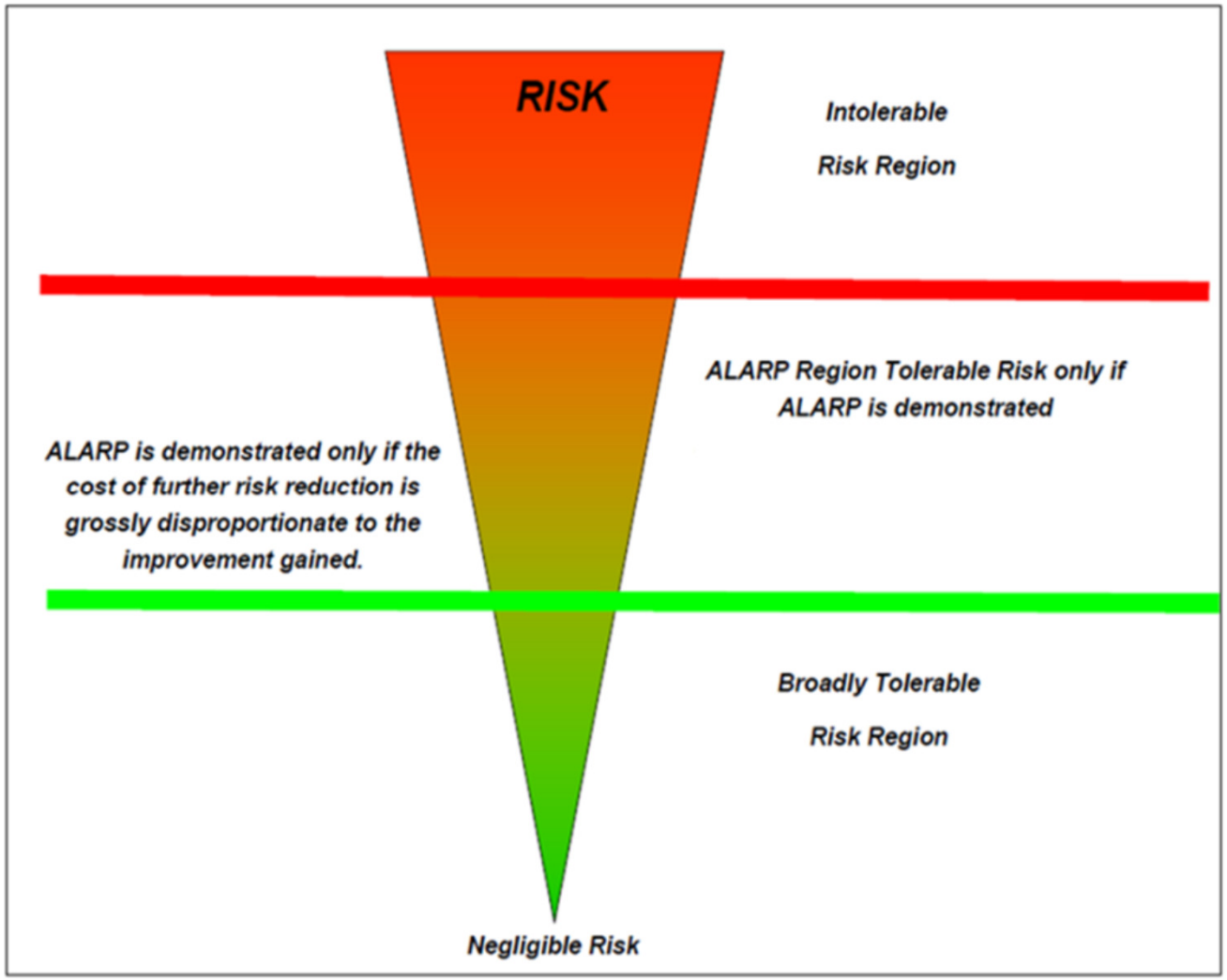
Risks should be reduced to ALARP

"Tolerable level of risk, at which it is possible to demonstrate that the cost of reducing it further would be grossly disproportionate to the benefits gained"



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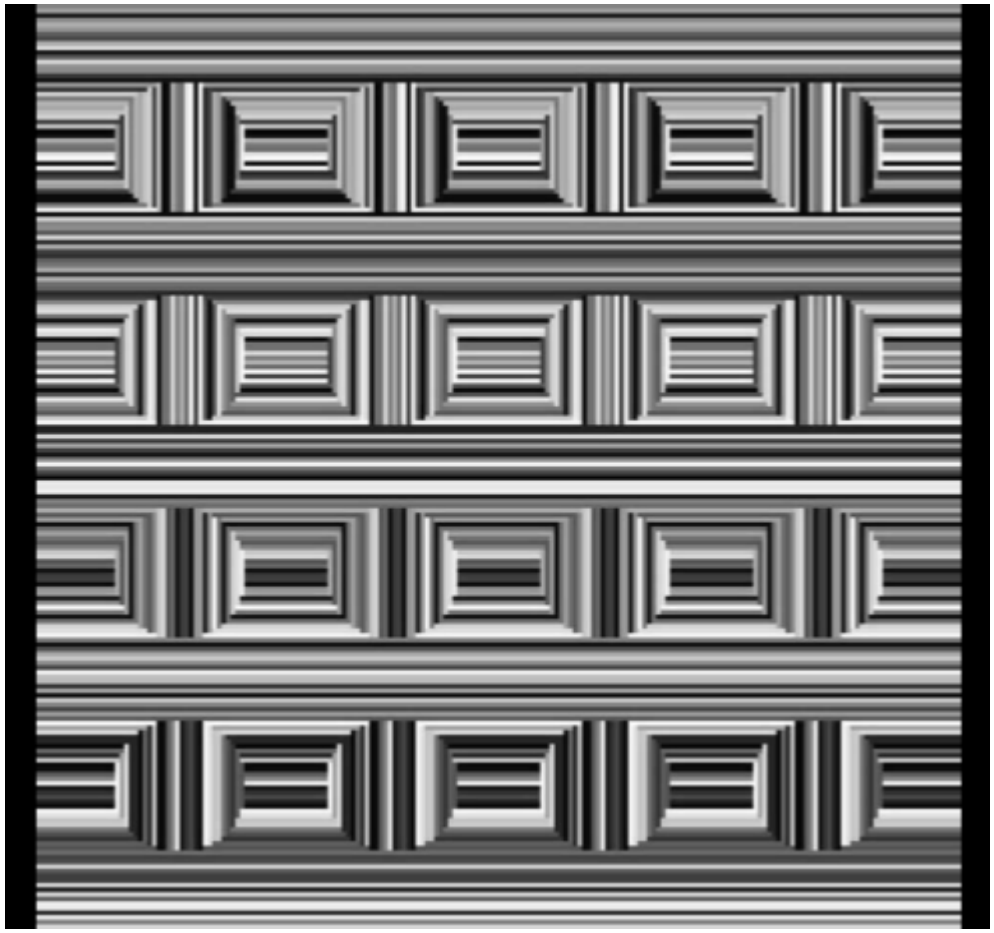
July 1988 – Piper Alpha, North Sea

Photo from http://www.bbc.com/

Activity

What do you see here?



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What affects safety critical decision-making in high risk and uncertain situations?

- **Representativeness (Стереотипизация)** - “What is the probability that process A will generate event B?” ***We judge the likelihood of B based on how much it resembles A***. Where the similarity of A to B is low the probability that B will result from A is also judged to be low.
- **Availability (Эффект доступности)** – ***Widely available information can be perceived as more important***. People have a tendency to assess the likelihood of a given outcome by the ease with which previous occurrences can be brought to mind. This could be misleading; especially given that the most common outcomes in safety critical processes are normal/low potential scenarios.
- **Anchoring (Эффект привязки/якоря)** - ***People often make estimates an event likelihood based on their own given input value.*** Usually if the input case includes a low estimate of likelihood, then the prediction will be relatively low. If input data suggests that an event has a low likelihood, people will underestimate the chances of it occurring.

Which FSU safety culture specifics add to safety-critical decision-making?

1. Leadership commitment is patchy and not always visible;
2. High risk tolerance and focus on compliance leads to blindness to hazards;
3. 'Negative discipline' (blame culture + imminence of punishment) hampers accountability and openness in discussing/reporting safety concerns;
4. Workers perceive themselves as parts of a single mechanism which operates to "reach the target", regardless of safety & health risks;
5. Extra compensations and early retirement for work in harmful conditions are an incentive to continue working in such conditions regardless of consequences;
6. Belief that responsibility for safety lies on the HSE Department and not operational and top management;
7. Out of date and old equipment that is not being upgraded or properly repaired has a corrosive effect on workers' commitment to safety as it undermines their belief that management is prepared to put zero harm first - leading to a sense of fatalism among workers and reduction of their attention/focus on safety.

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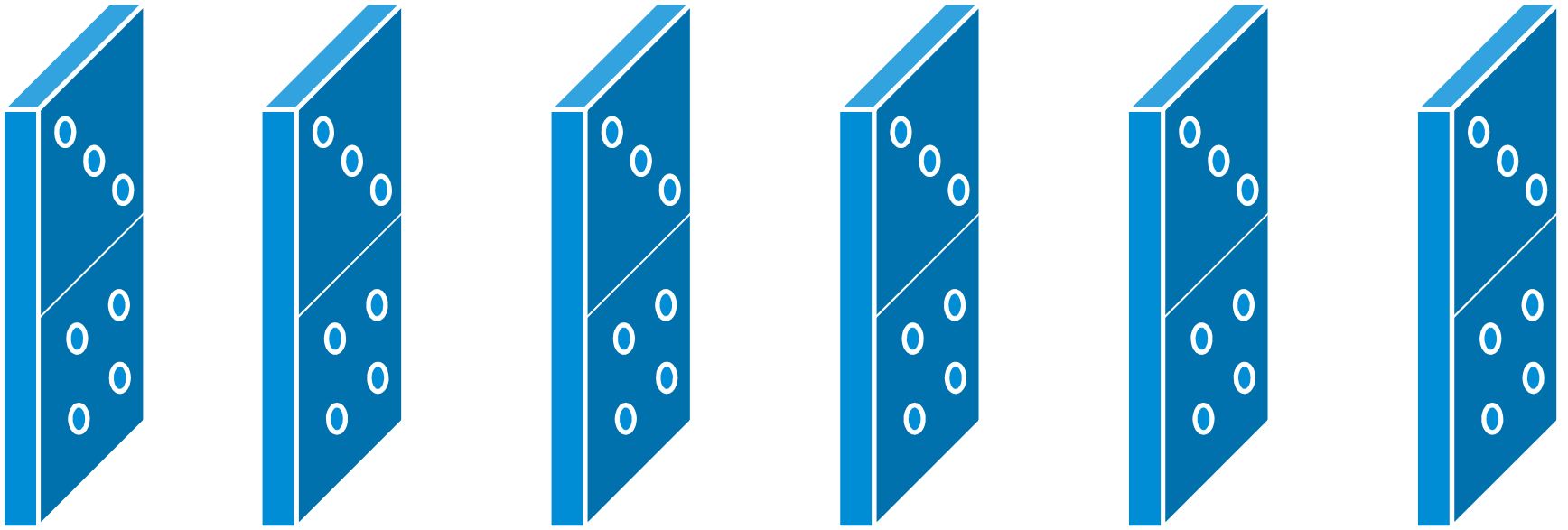
How drifts into failures usually happen?



What is common to all these major catastrophic events?

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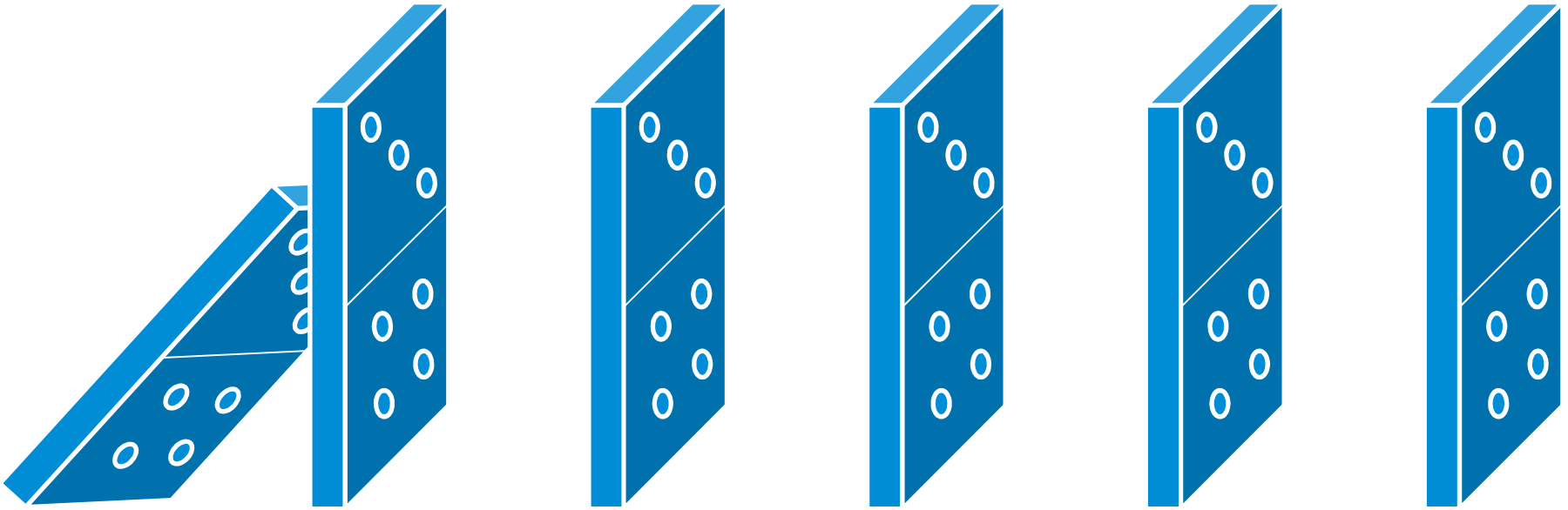

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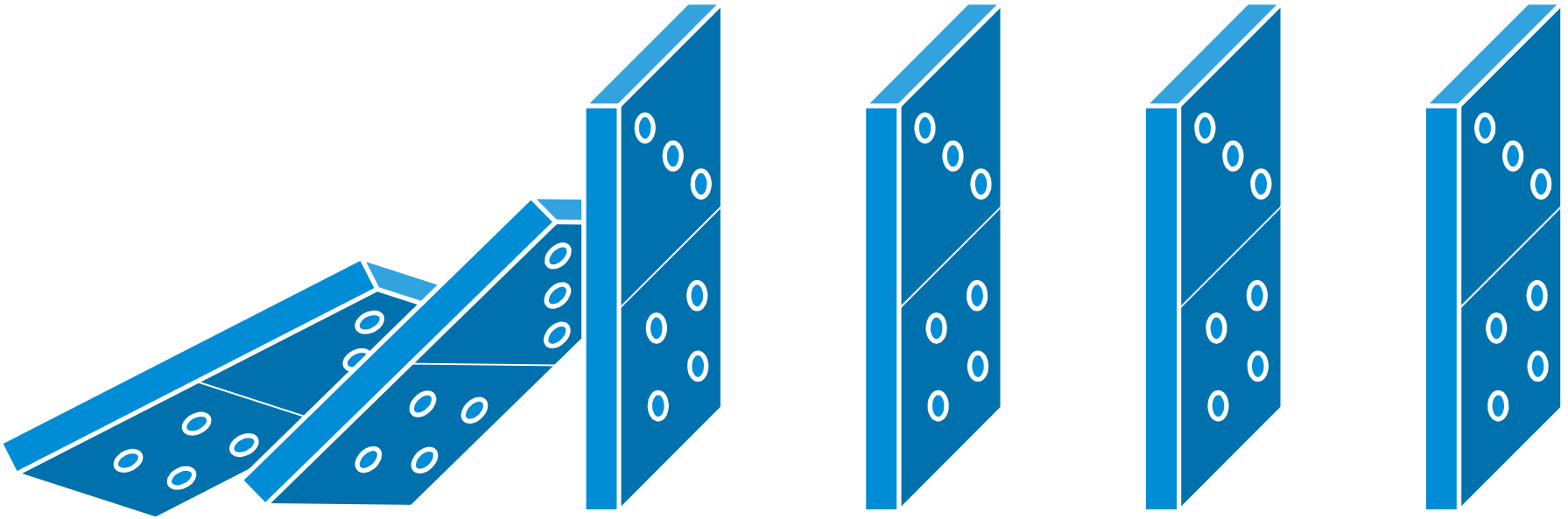

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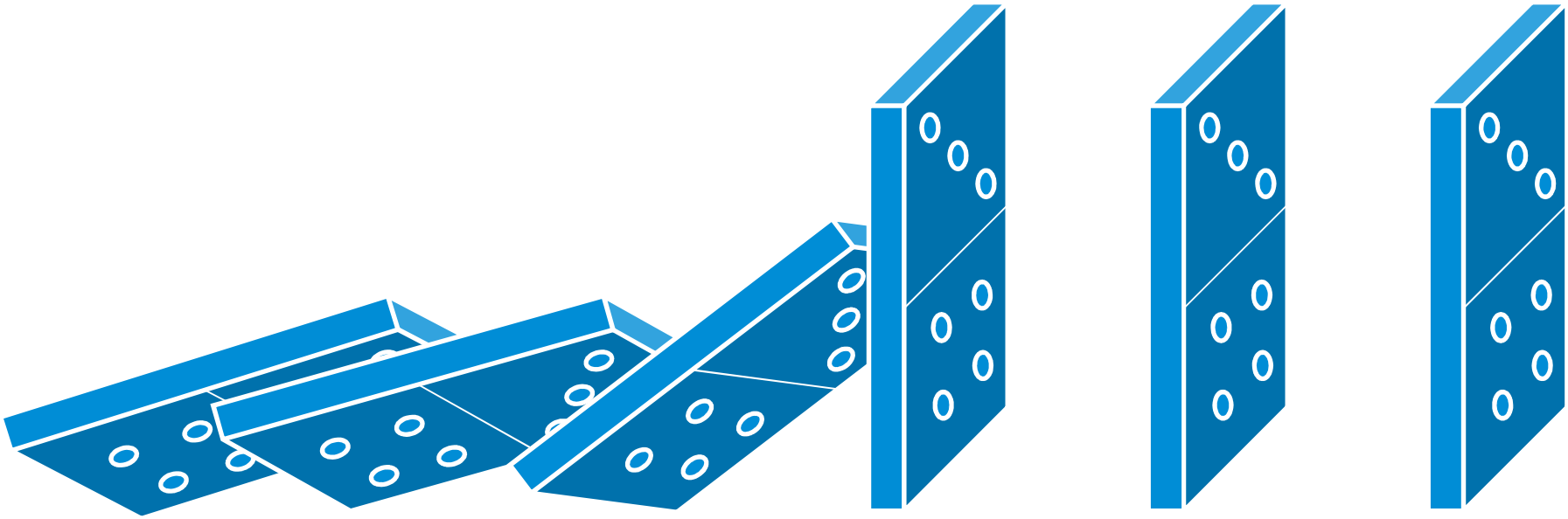

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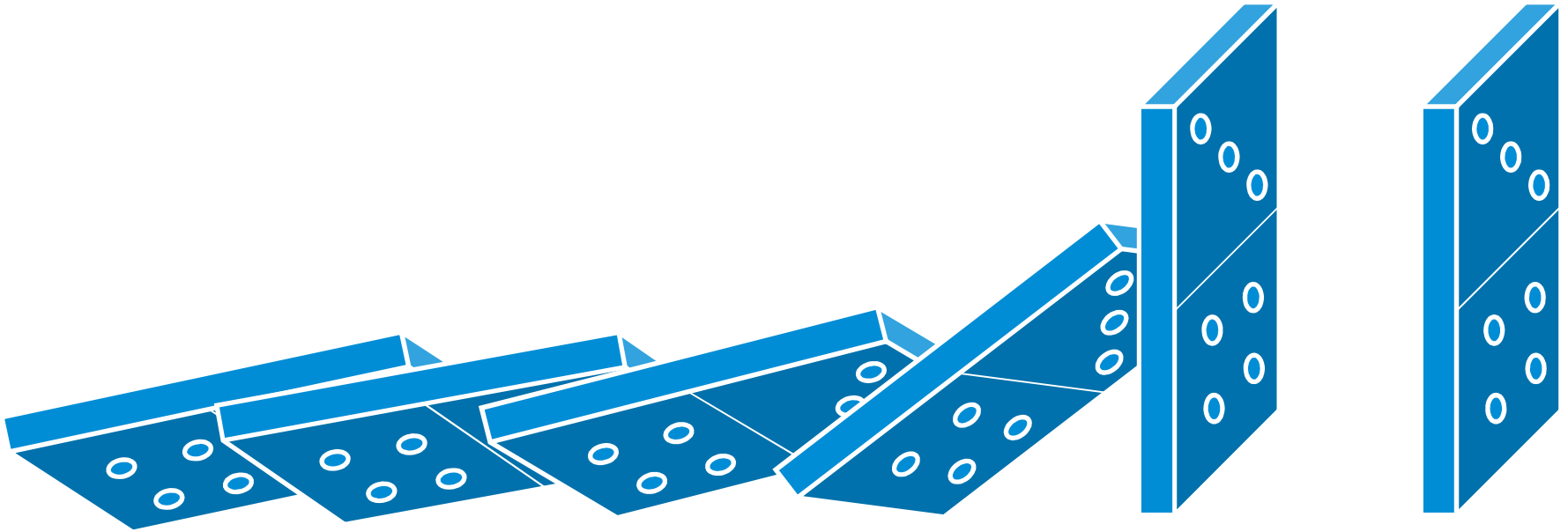

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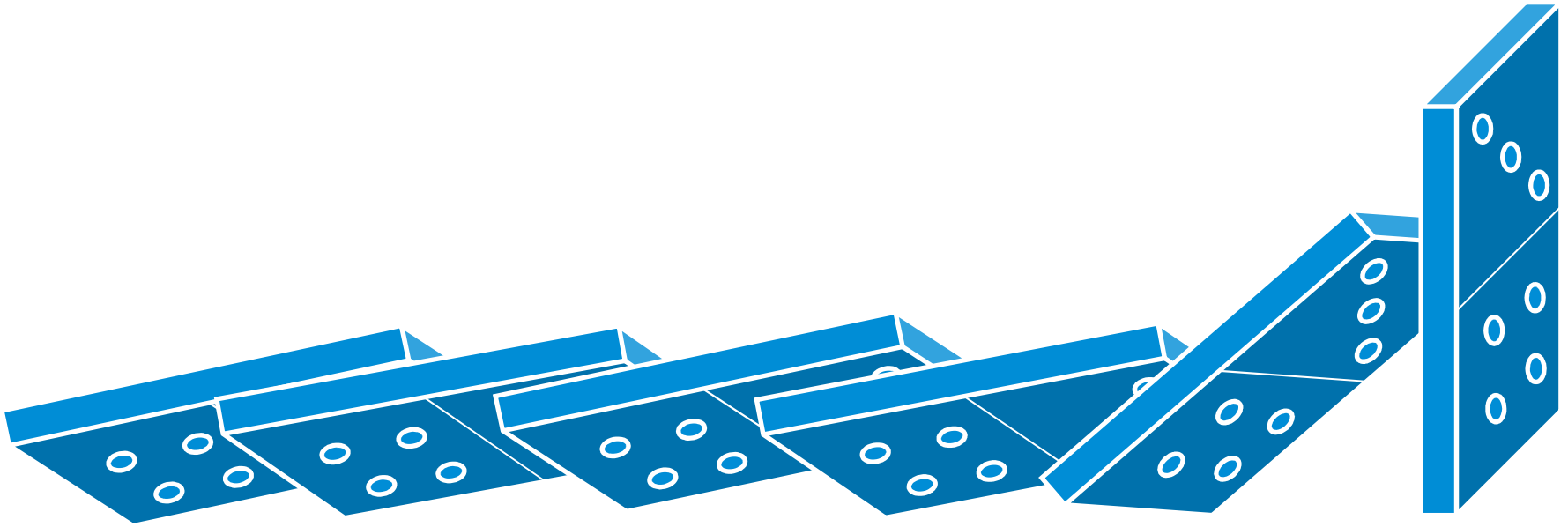

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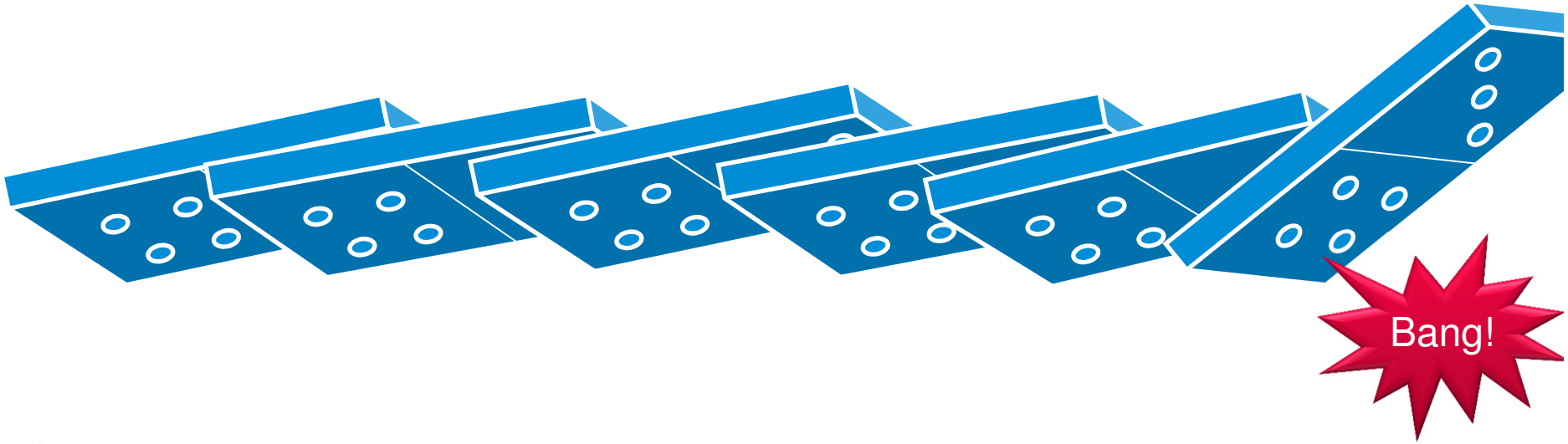

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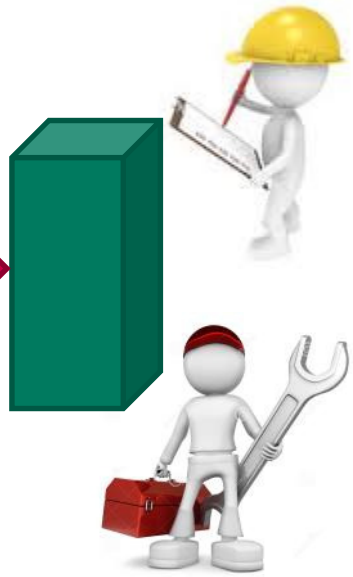
Failure to Manage Risk

People as barriers – safety critical tasks

Threat

People maintain the physical barrier

Threat



People maintain the organisational barrier

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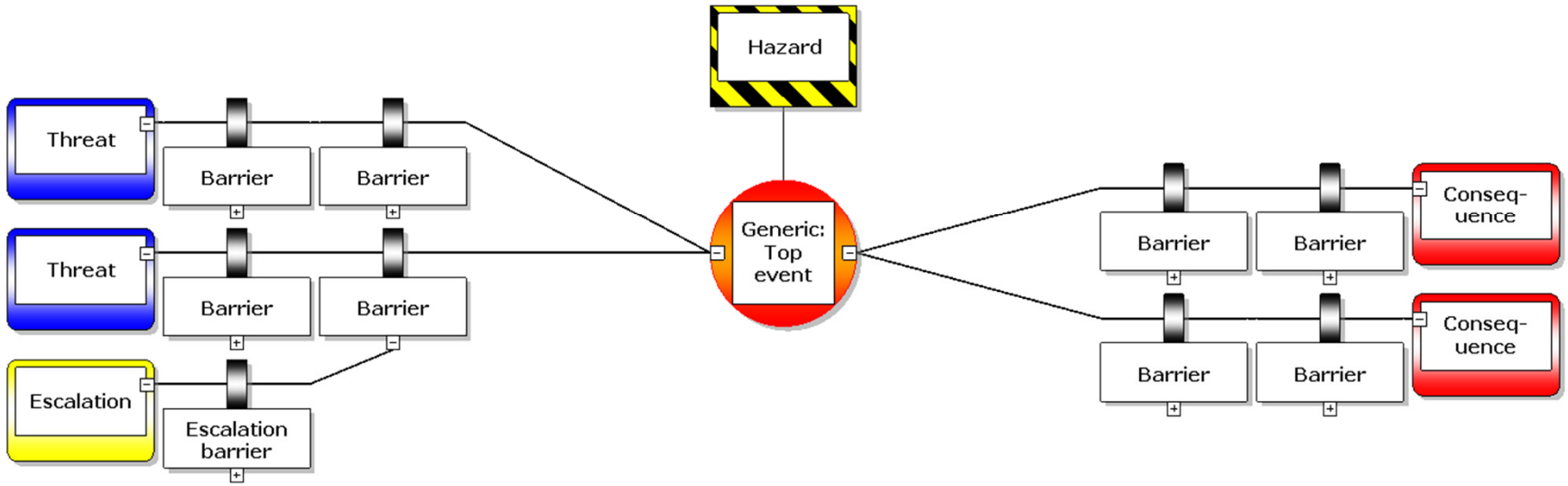
Bowties are “Central” to Barrier Management

Shows Accident Event (at centre), it’s Causes (on left) and Consequences (on right) and the measures (barriers) in place to prevent, control, mitigate and recover.



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Barrier Management Plan

Operation	
Critical barrier	• Identify the specific barrier measure
Barrier objectives	• What is the objective of the barrier that prevents or mitigates the major hazard and makes it critical? The claims?
Safety critical tasks	• What are the tasks that people must perform to operate or maintain the barrier? • What is the required performance quality of these tasks (what error modes must be controlled)? • What additional control measures are needed to manage the risk of error?
Deliberate violation	• Can the control measure be omitted? • Can the barrier be by-passed?
Control responsibility	• Who (what role) will perform these tasks? • Who (what role) will check their performance?
Training and competence requirements	• What specialist knowledge and skills are required to perform the tasks? • How will this be provided and assured?
Reliability	
Criteria to meet barrier objectives	• What is the target performance of the barrier (e.g. sensitivity)? • What are the availability and reliability criteria?
Assessment process	• How are the sensitivity, availability and reliability to be assessed?
Critical measures	• Are specific measurement processes to be applied (e.g. NDT)? • What are the required measurement tolerances?
Test frequency	• How often are the assessments required to be performed?
Assurance measure	• What is the evidence that the assessments are completed satisfactorily?
Concerns	• What weaknesses have been identified for this barrier?
Remedial actions	• What improvement actions must be applied to address the concerns? • Who will be responsible for their completion? • What is the due date for completion?

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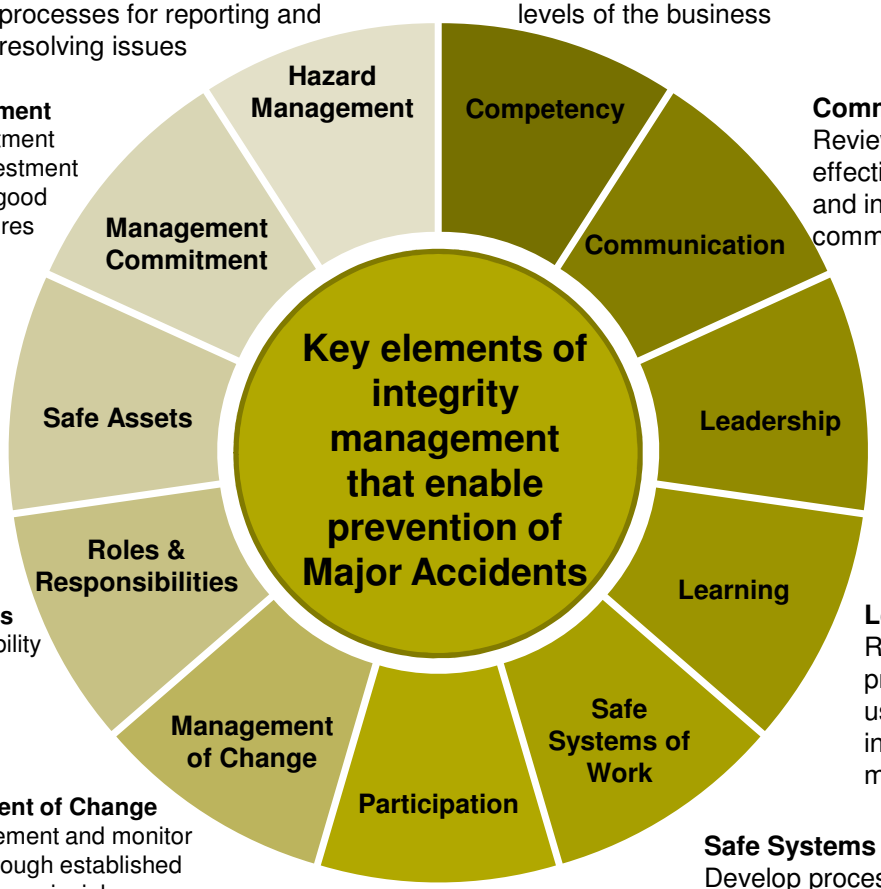
Integrity Management prevents Major Accidents



Hazard Management
Awareness of hazards and associated risks and suitable processes for reporting and resolving issues

Competency
Assess & develop staff competence across all levels of the business

Management Commitment
Showing visible commitment through sites visits, investment and implementation of good processes and procedures

Communication
Review and improve the effectiveness of formal and informal communications

Safe Assets
Ensure asset condition does not create or contribute to additional risk either directly or indirectly

Leadership
Train people to be good leaders and enhance safety culture through strong leadership

Roles & Responsibilities
Define areas of responsibility and accountability.

Learning
Review and learn from previous performance using incident investigation and monitoring and feedback

Management of Change
Plan, implement and monitor change through established best practice principles

Safe Systems of Work
Develop processes and procedures which are fit for purpose and useable

Participation
Engage all levels of the organisation to understand the business and impacts of decisions

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- Leading consultancy providing risk, health & safety, environmental and social services for over 40 years
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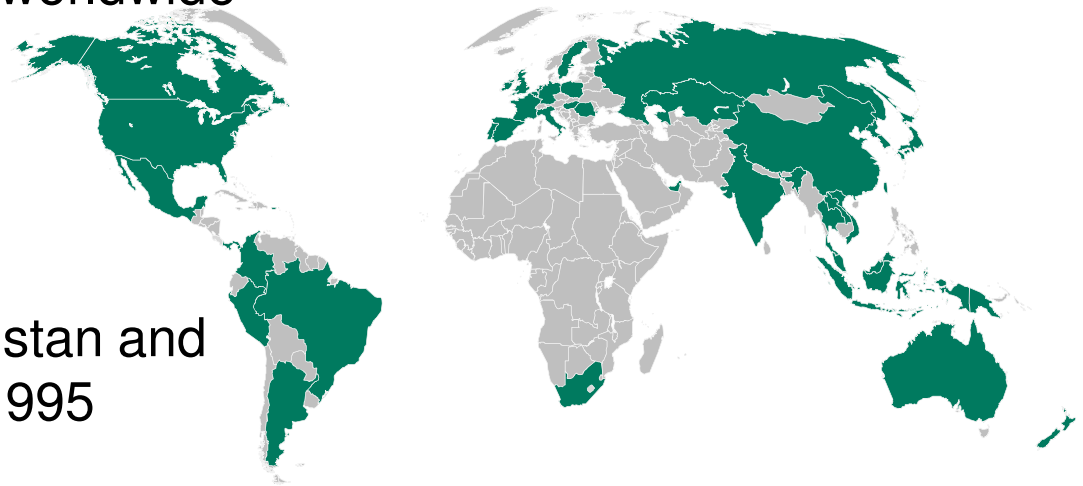
- > 4500 professional staff
- Completed projects in > 160 countries
- Working in Russia, Kazakhstan and other CIS countries since 1995



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