

Why critical control programs stall and how to sustain them

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The bowties were perfect. The controls weren't.

- A real site.
- An incident review found a critical control had been bypassed for months.



You have bowties too. Would yours hold up?

- Most sites can show the documents. Few could prove the controls still work.
- Field studies put critical control reliability around 42%.



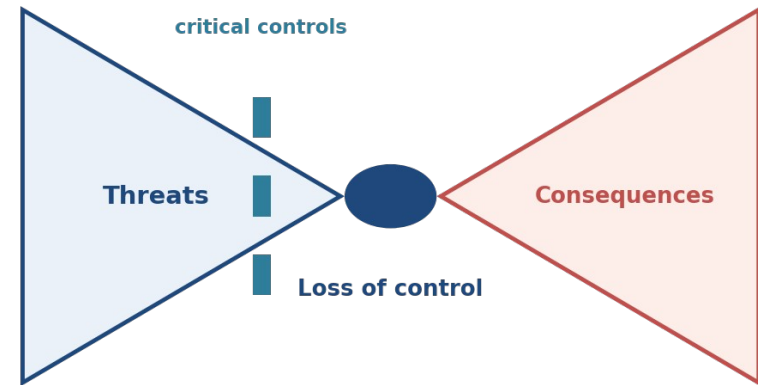
Twenty-plus operations. Twenty-five years at the bowtie.

Impress Solutions: critical risk management across coal, metalliferous, quarry and energy.



A bowtie is a promise about what must hold. Programs stall on keeping it.

- A bowtie makes a promise: hold the few controls that must hold, and the fatal event can't happen.
- Keeping that promise is where programs stall in three ways:
 - 1 – Performance standard quality gaps
 - 2 – The Verification Trap
 - 3 – The Integration Gap



The few that must hold

Failure Mode 1 – Performance standard quality gaps

- The guardrail's standard: "edge protection shall be robust."
- vs
- "Top rail 900–1100 mm; withstands 1.5 kN; verified quarterly."
- If two people can't agree on pass or fail, verification is guesswork.



Failure Mode 1 – What sustaining operations do

- Sustaining operations write measurable requirements for each control:
- what it must do, and how well (functionality, availability, reliability)
- how it can fail, and the trigger to act
- how it's verified, and who owns it

Failure Mode 2 – The Verification Trap

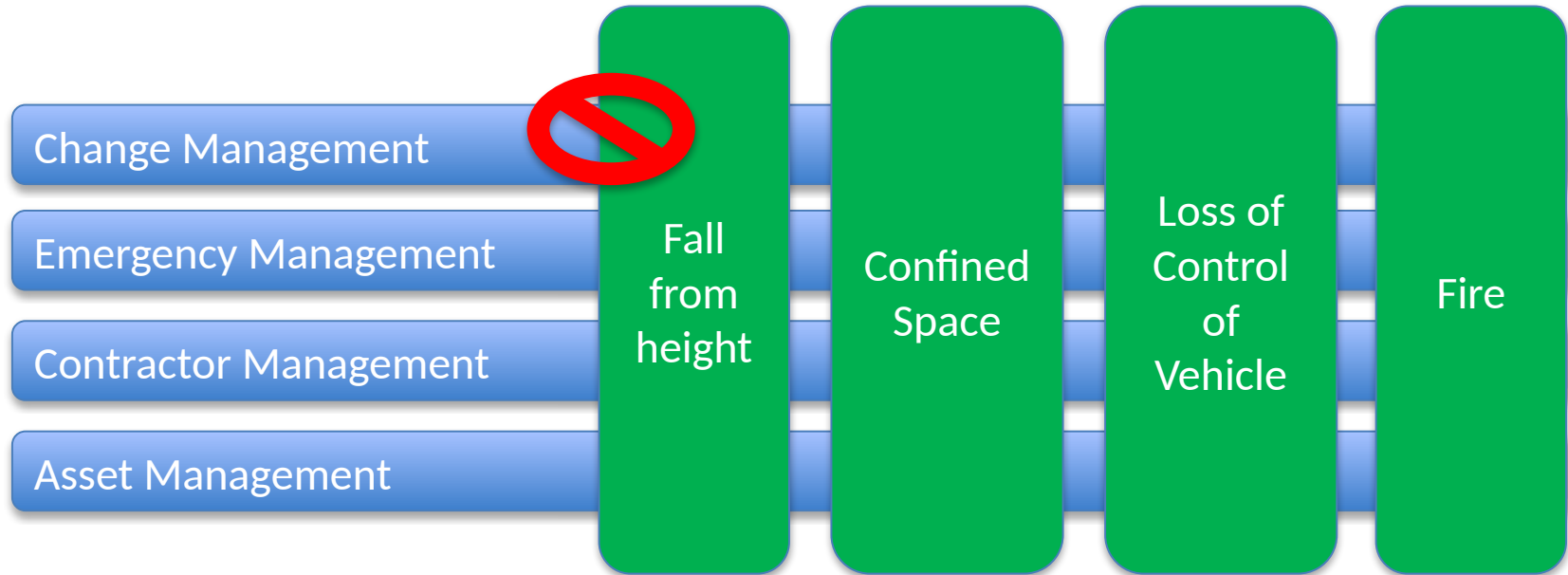
- The monthly check said, "edge protection: in place." Ticked green.
- The reality: a guardrail section removed to land materials, never reinstated.
- A checklist confirms a control exists. It never tests whether it works.



Failure Mode 2 – What sustaining operations do

- Sustaining operations verify by testing effectiveness, not presence:
- What to check — against the performance criteria
- How many — a defined sample
- Where and when — at the point of work, on a risk-based frequency
- The evidence required to pass
- An independent verifier (not the person who does the work)
- Rated good / satisfactory / inadequate — not just a tick

Failure Mode 3 – The Integration Gap



Failure Mode 3 – What sustaining operations do

- Sustaining operations connect the control to the systems around it:
- Management of change — no removal without a reinstatement signed off
- Permit to work — reinstatement as a hold point before access
- Asset integrity — the barrier stays fit for service
- Emergency and contractor management aligned to the control
- The golden thread — from the unwanted event to the point of work

Sustaining operations do three things differently.

- Testable performance standards. In language the frontline can act on.
- Verification that tests effectiveness, independently.
- Controls connected to the systems around them. The golden thread.



Find your own failure mode in three questions.

1. Could two people agree on pass or fail for the same control? (performance standards)
2. Does verification test whether the control works, or just confirm it exists? (verification)
3. When plant, people or contractors change, do the supporting systems move with the controls? (integration)



What if this held across your whole program?

- A supervisor can open any bowtie, name the controls and their owners, and know they're verified and working.
- Programs stall on the connection to people and systems, not the analysis



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Questions

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