Critical Control Management (CCM)

1. The development approach of the ICMM CCM guide
2. Overview of the CCM process steps
3. Suggested CCM implementation planning required to facilitate effective adoption, maximising value realisation.

Project No:	Section of Facility:	Date:	Page:
Description of Scenario:		Team Leader:	
		Team members:	
Reference Documents:		Minutes By:	

Item No.	Initiating Event	Hazard Type and Magnitude	Description of Potential Effects				Existing Control Measures			Risk Ranking			Actions	Accountability
			People	Biophysical Environment	Property	Economic Impact	Description	Critical Control	Accountability	Likelihood Rating	Consequence Rating	Risk Rating		

- Poor quality of unwanted events
- Too many unwanted events
- Limited identification & review of Controls
- Too many controls
- Critical controls?
- Accountability?
- Control quality assurance?

ICMM CCMP Project Objective

- Produce a user-friendly guide outlining a model end-to-end ‘material’ health and safety (H&S) risk management process

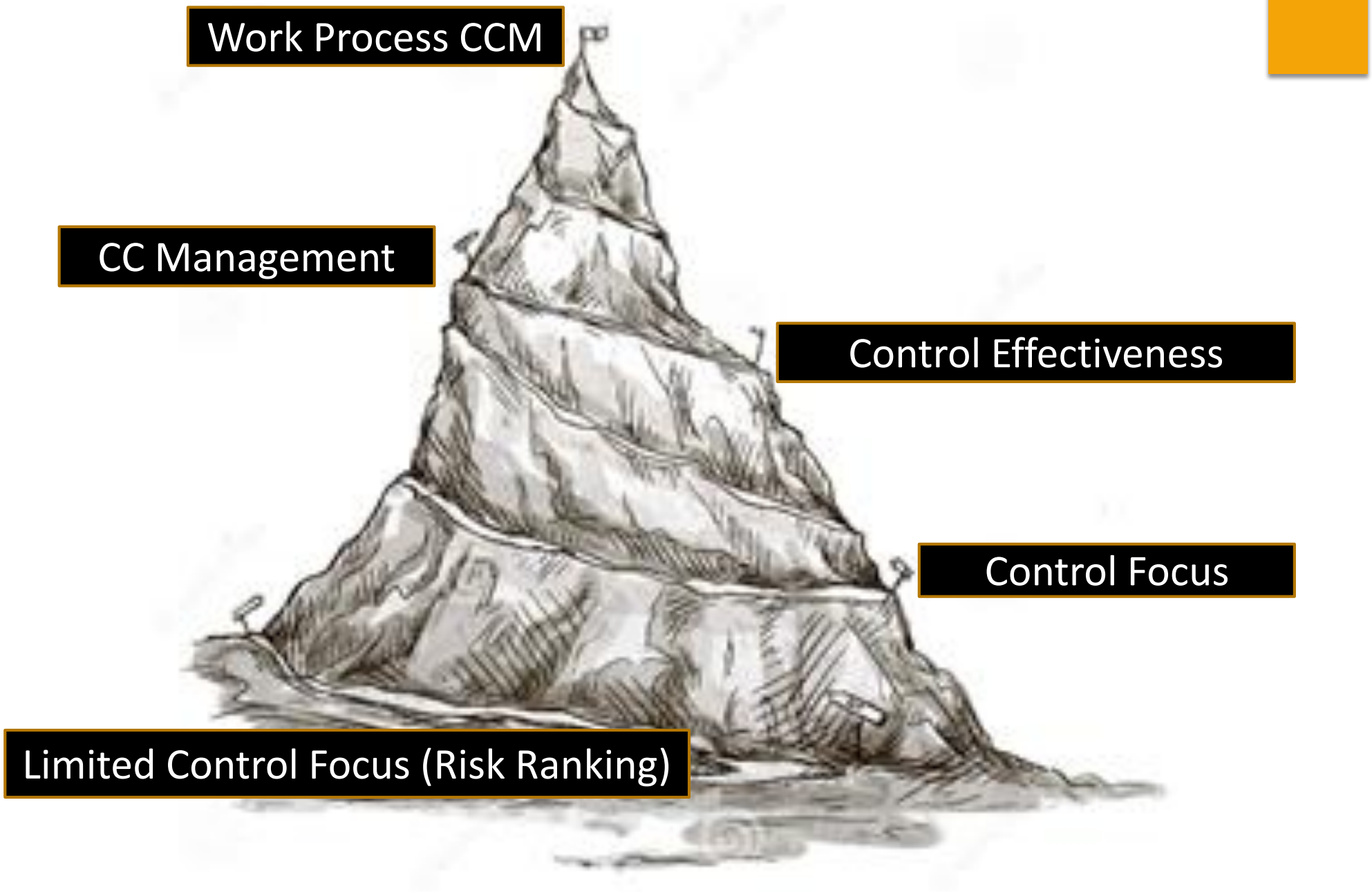
- The guide will include:
  - a definition for ‘critical controls’,
  - the process for identifying critical controls,
  - the process for defining performance and assurance criteria for critical controls, and
  - an understanding of how to assess and manage to achieve critical control effectiveness.

CCM Project Method

1. Survey all ICMM Members about CCM and related leadership
2. Identify the leading practice elements
3. Gather more information from CCM practitioners
4. Consider Alpha and ACARP studies
5. Draft the ICMM guide
6. Complete the final guide and the support resources.

The ICMM Survey – 16 companies replied

- Organisational Context
- The Process of Critical Control Management
- Related Organisational Culture Factors
- Feedback on the Overall Process
- ICMM Risk Guidance information


Work Process CCM
CC Management
Control Effectiveness
Control Focus
Limited Control Focus (Risk Ranking)

Risk component

What are the critical controls?

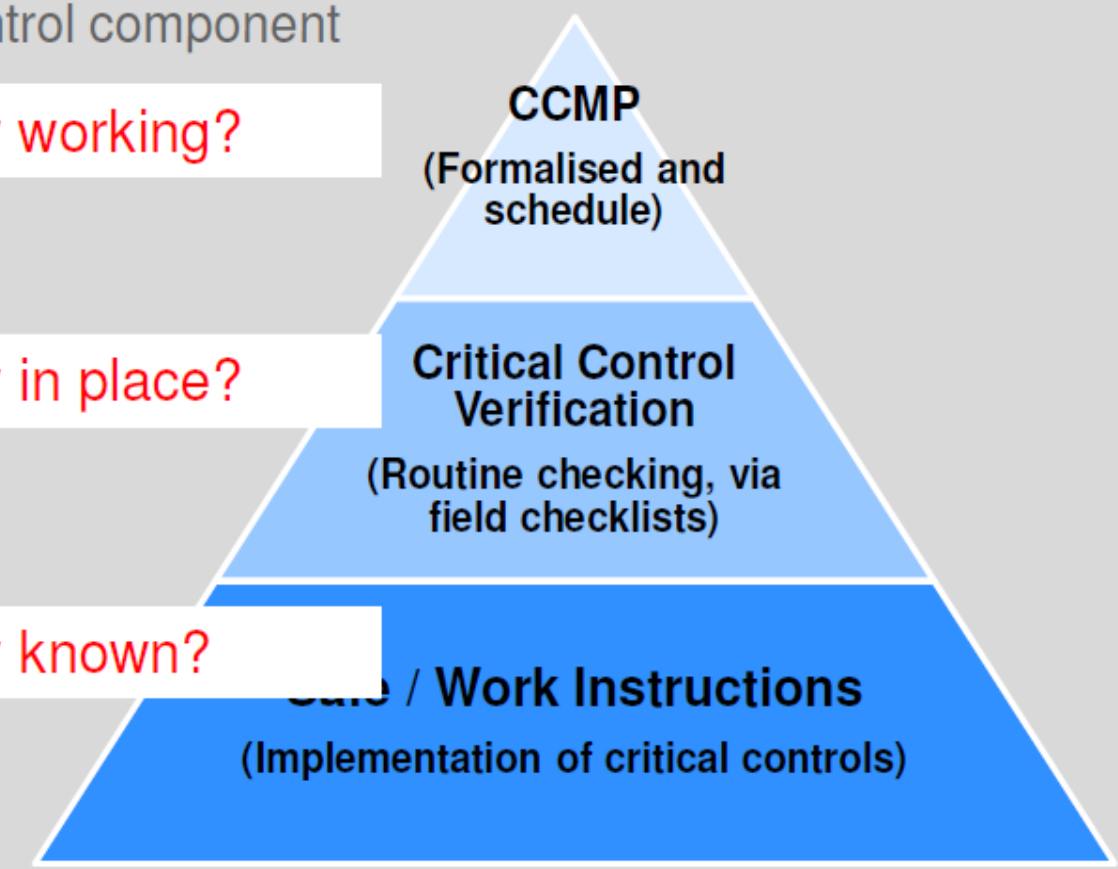
Risk & Bow-tie analysis

Critical control component

Are they working?

Are they in place?

Are they known?



- **CCM is a major positive step change**
- **Management of the change is part of the 'journey'**
- **Other internal & external stakeholders should join the 'journey'**
- **Current RM quality, leadership and 'mindset' issues can affect the changes!**

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MUE Owner Accountability

CC 1 Owner Accountability

CC 1 verification activity 1

CC 1 verification activity 2

CC 1 Owner Accountability

CC 2 verification activity 1

CC 2 verification activity 2

CC 2 verification activity 3

Critical Control

Critical Control

CCMP for Vehicle Collisions

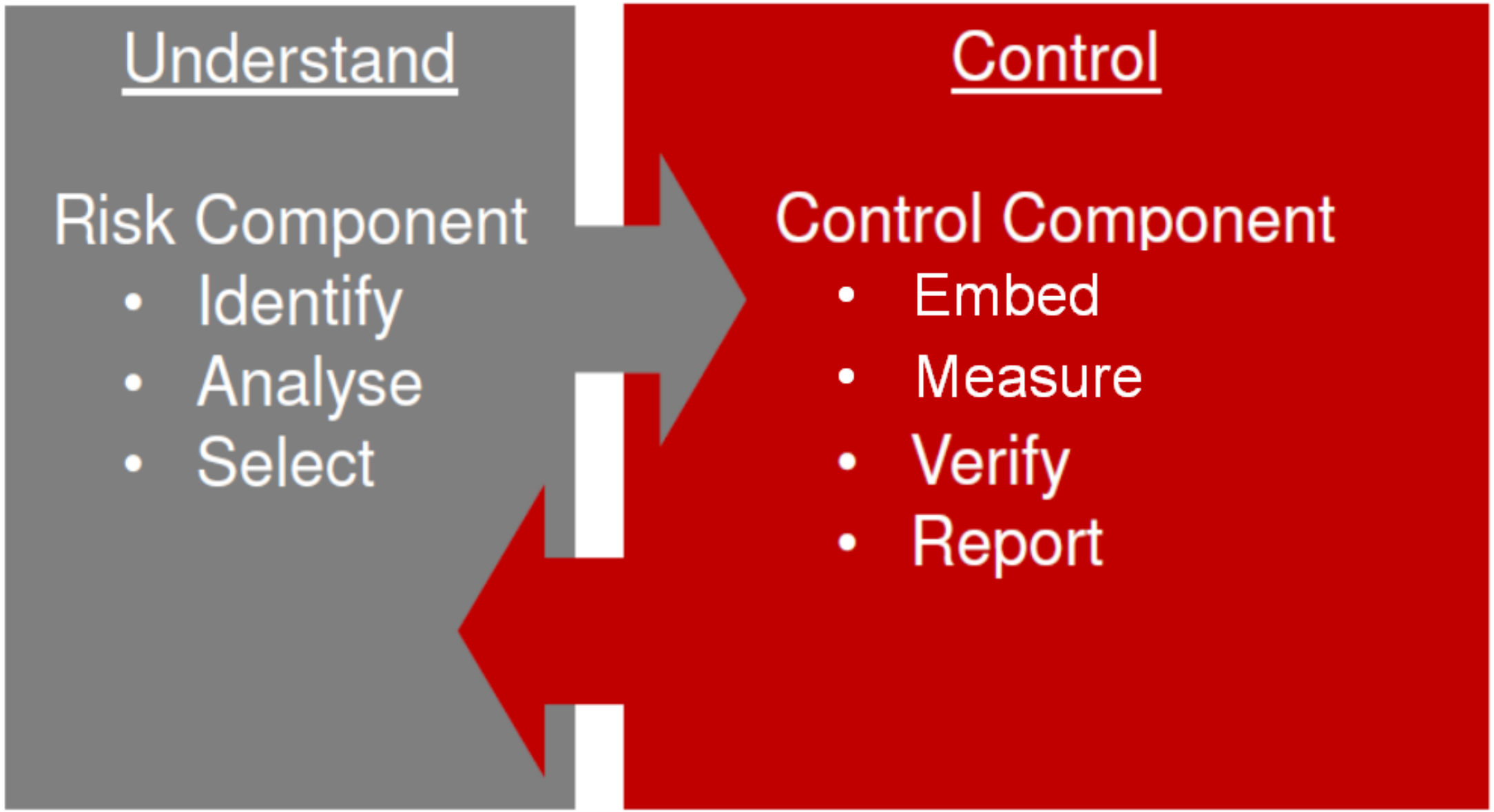
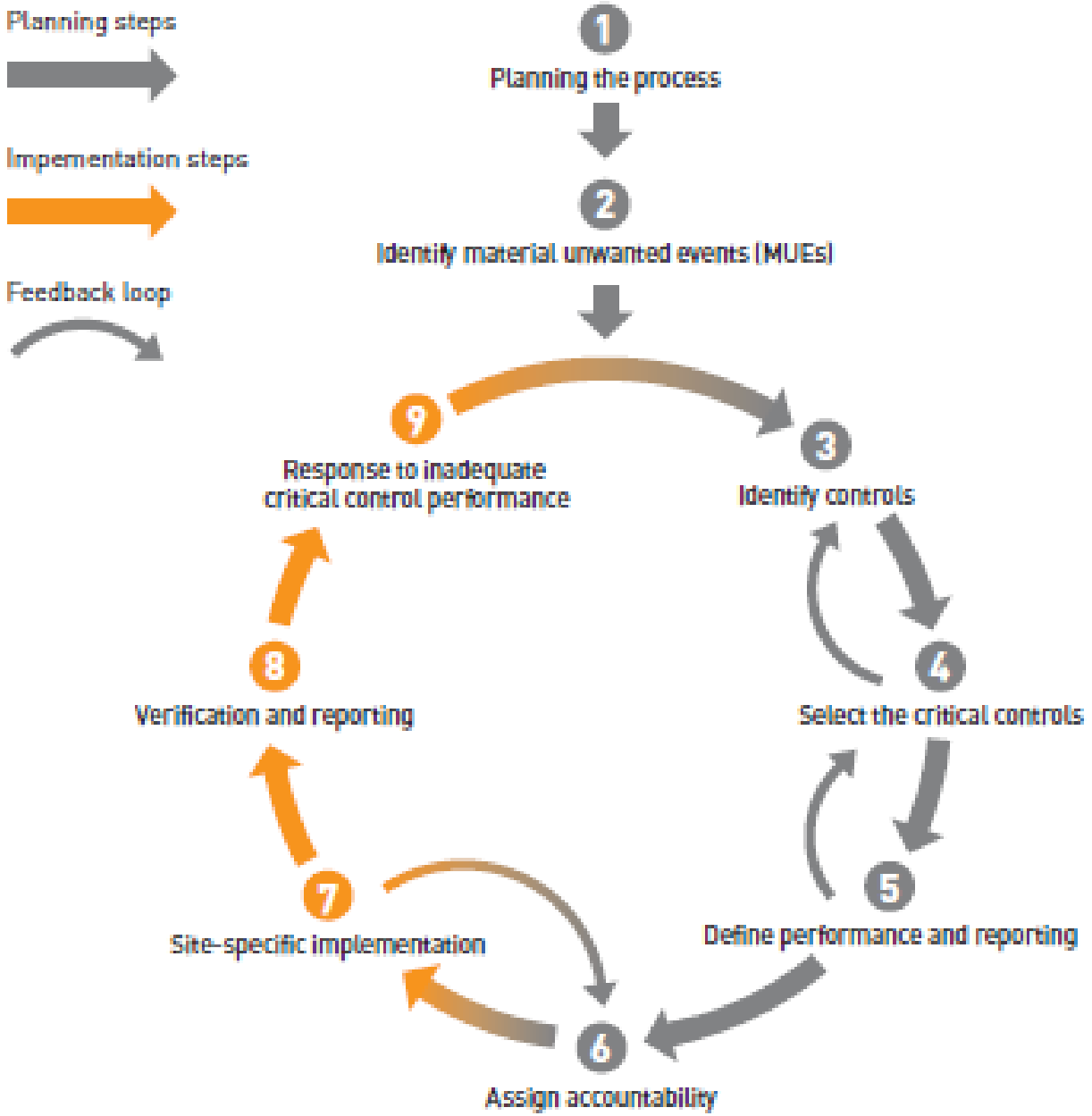

Understand
Risk Component
• Identify
• Analyse
• Select
Control
Control Component
• Embed
• Measure
• Verify
• Report

Figure 1: The critical control management process



Current good practice site ORM

Objective

To look across an entire organisation or site, find potential major unwanted events, analyse them, establish required controls, document requirements and apply the outcomes.

CCM integration

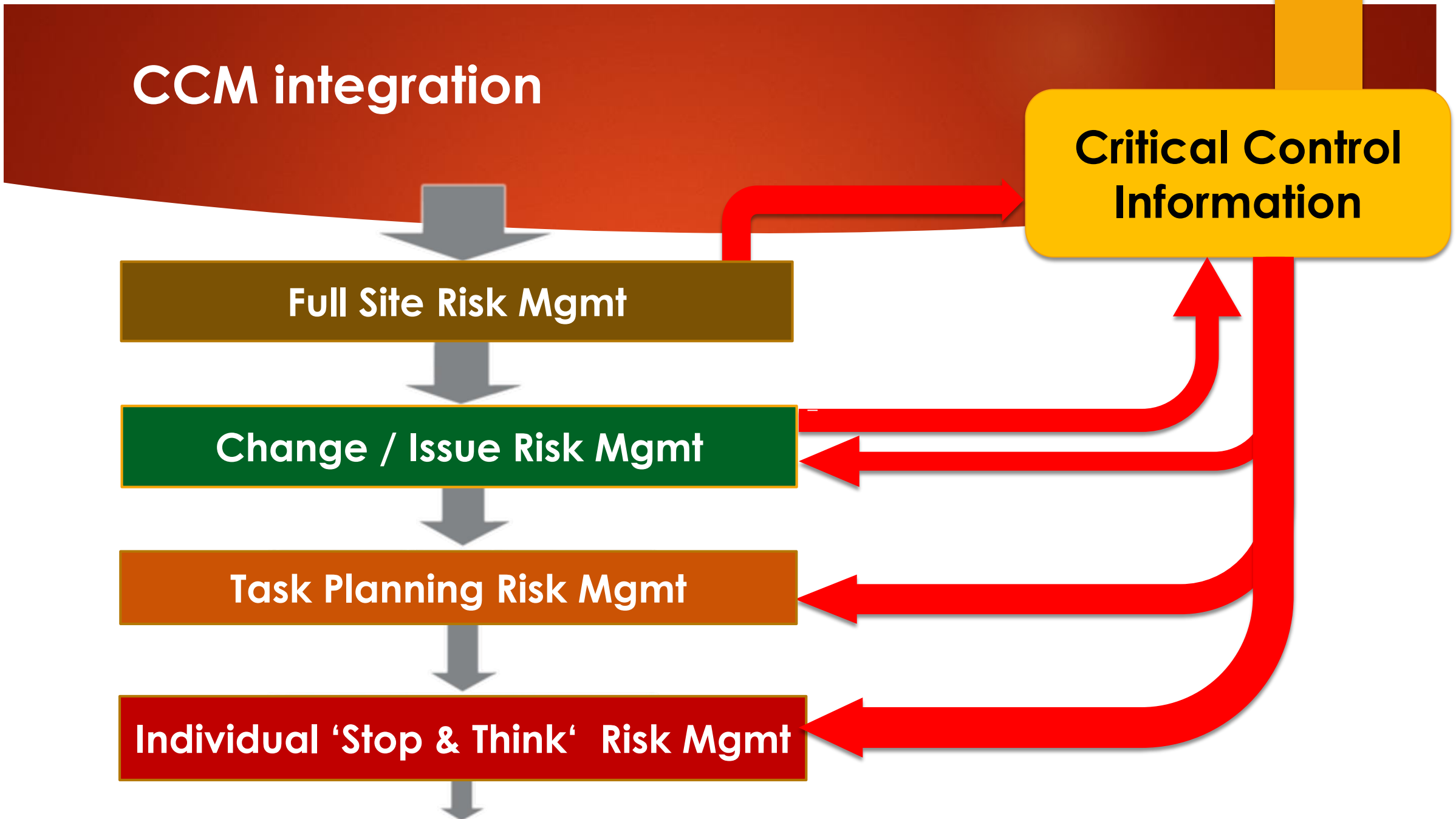
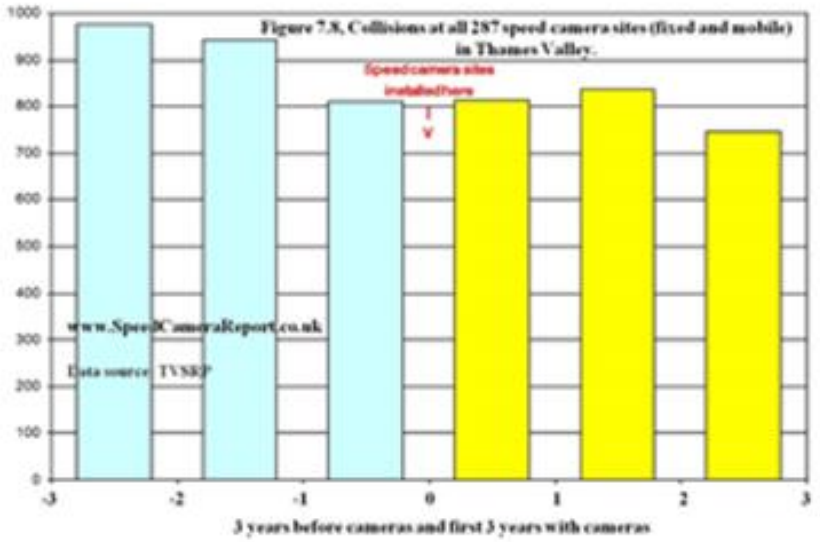


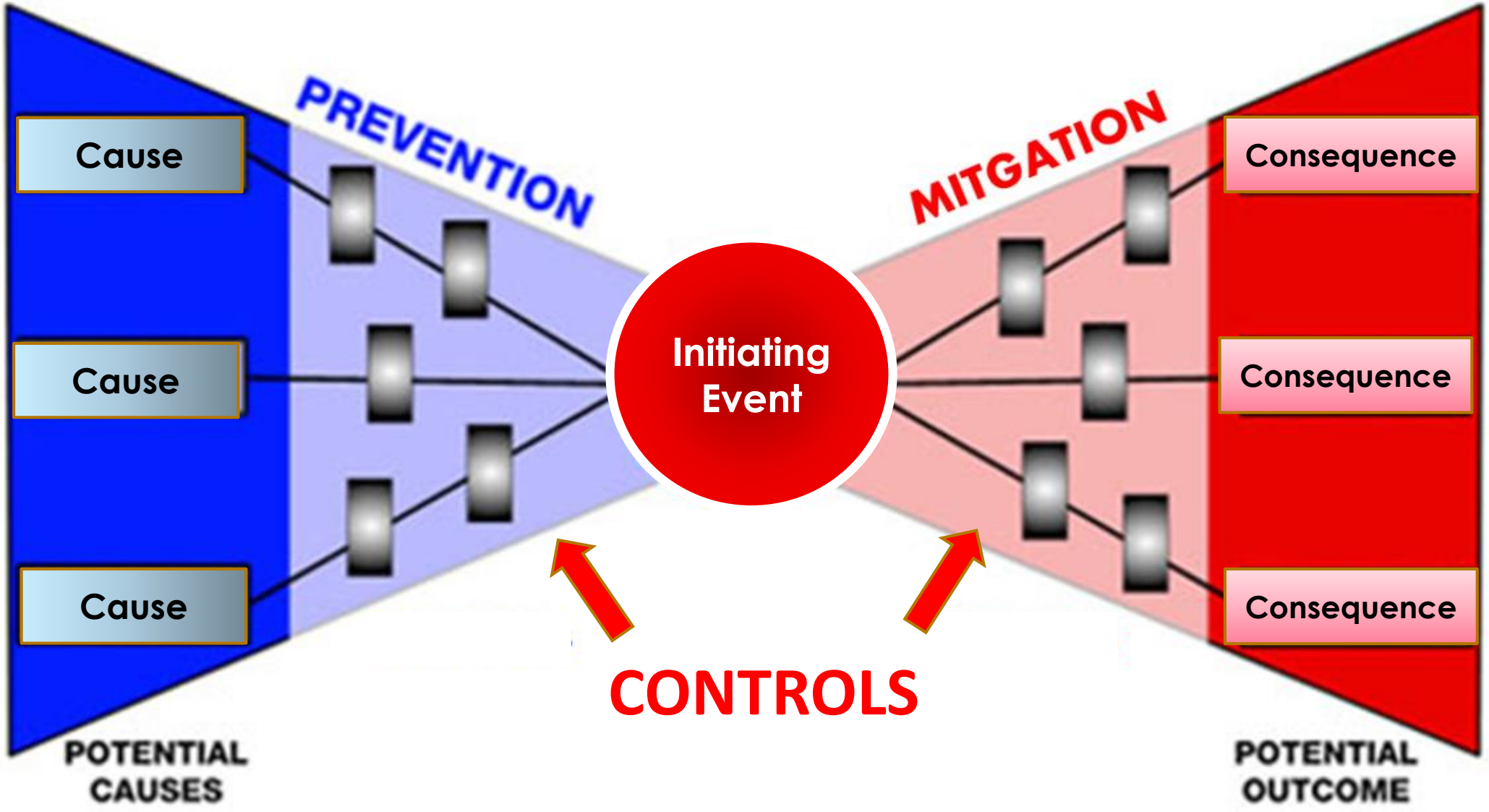
Figure 1: The critical control management process

Controls are:

Acts – a description of what a person should do
Objects – a device that works when needed without a persons act(s), or
Systems – combination of act(s) and object(s)



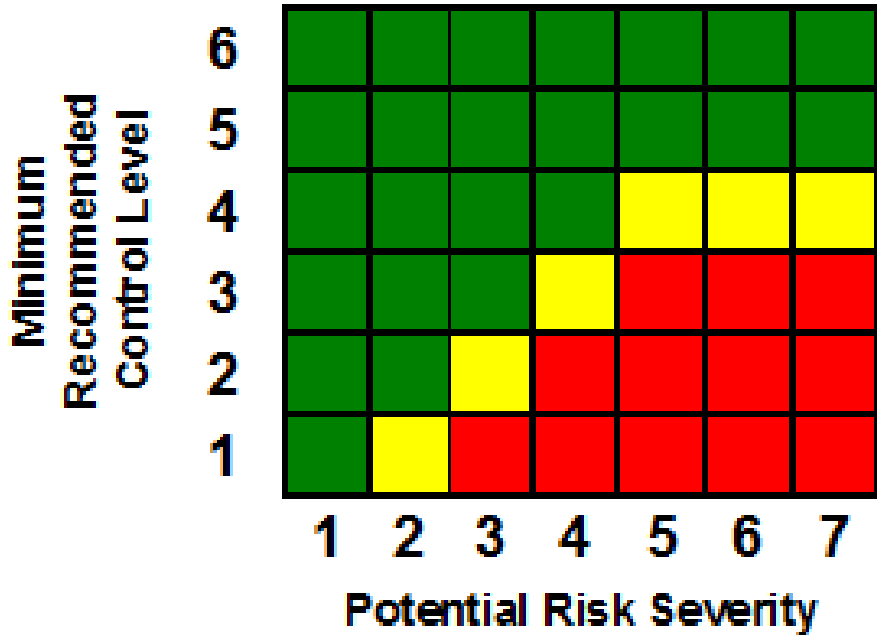
Specifiable **Measurable** **Auditable**



The Bowtie Analysis (BTA) method

Considering Control Effectiveness

Control Level	ACT	SYSTEM	OBJECT
1			
2			
3			
4			
5			
6			



Legend

- Control design likely to be appropriate
- Control design may require enhancement
- Control desion likely to require enhancement

ACARP C23007: SELECTION AND OPTIMISATION OF RISK CONTROLS

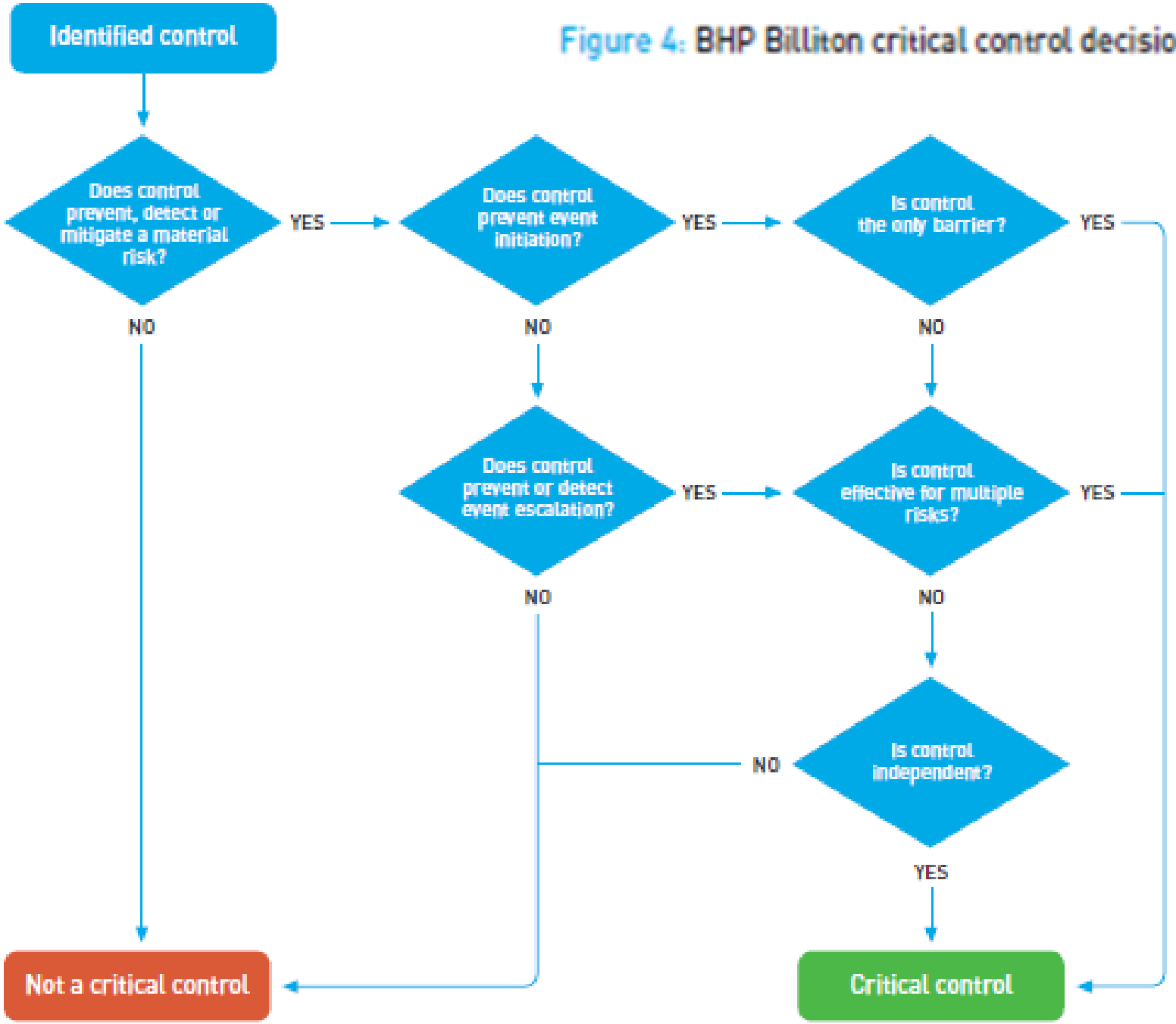
- To define ‘Control Optimisation’ methods for determining tolerable risk at sites.

- The Team:

Maureen Hassall Chris Doran

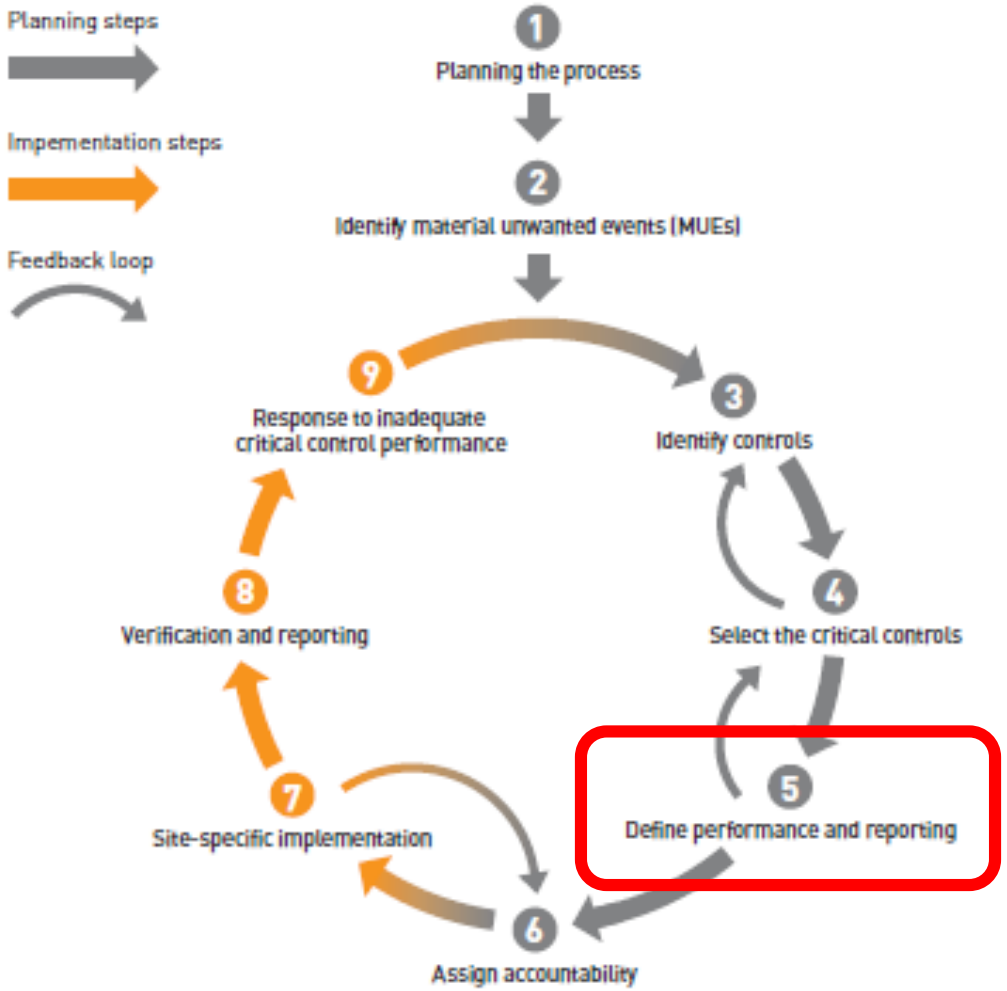
Marcus Punch Jim Joy

Figure 4: BHP Billiton critical control decision tree



a definition for ‘critical controls’

Figure 1: The critical control management process



Control information summary

For each critical control the following information is needed:

- The name of the critical control
- What are the specific objectives of the critical control?
- What performance is needed from the critical control?
- What activities support the performance of the control to the standard?
- What verification activities are needed to ensure the critical control is meeting its required performance?

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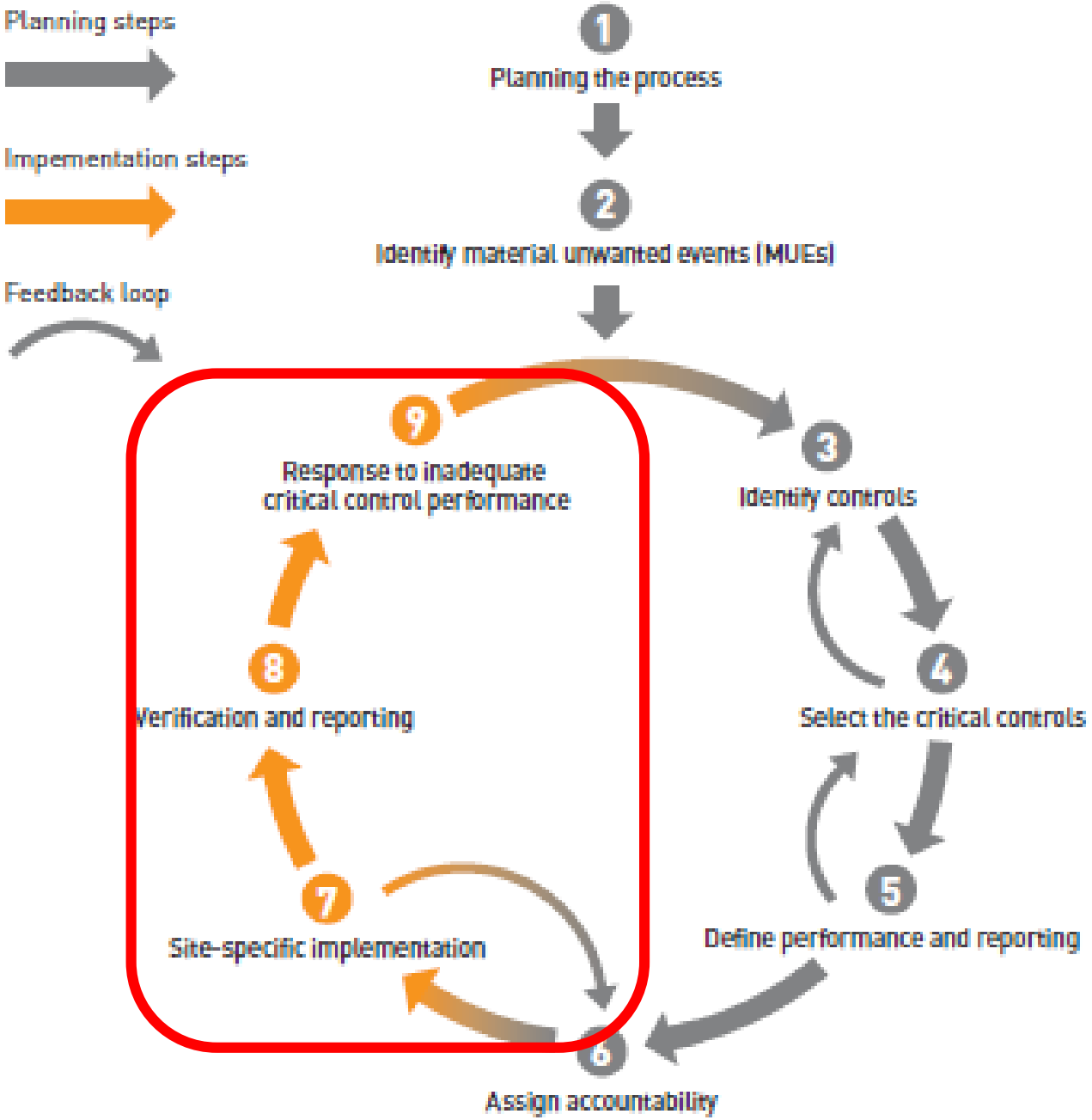


Event Owner

CC 1 Owner

CC 1 verification activity 1

CC 1 verification activity 2

Critical Control

CC 2 Owner

CC 2 verification activity 1

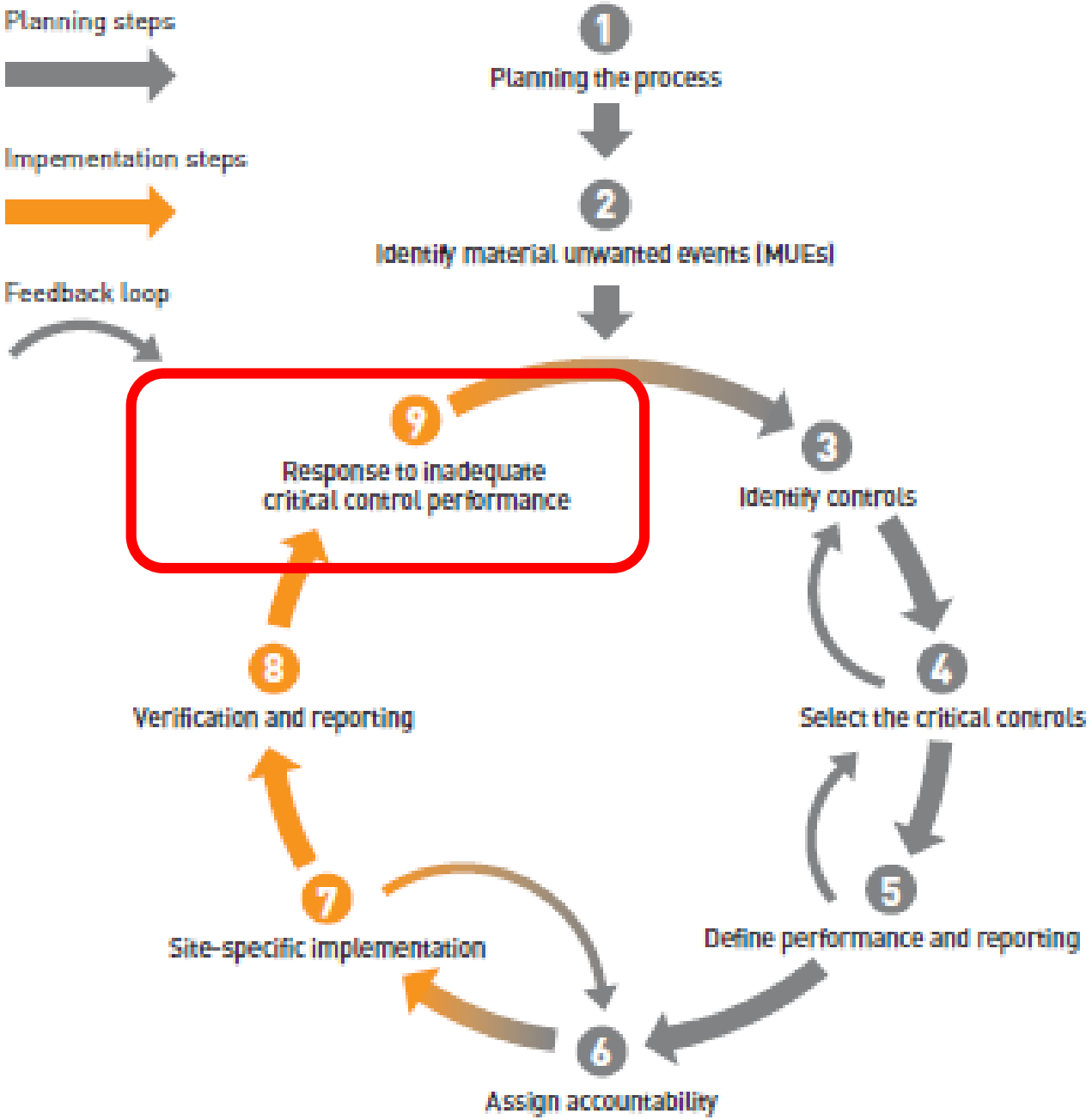
CC 2 verification activity 2

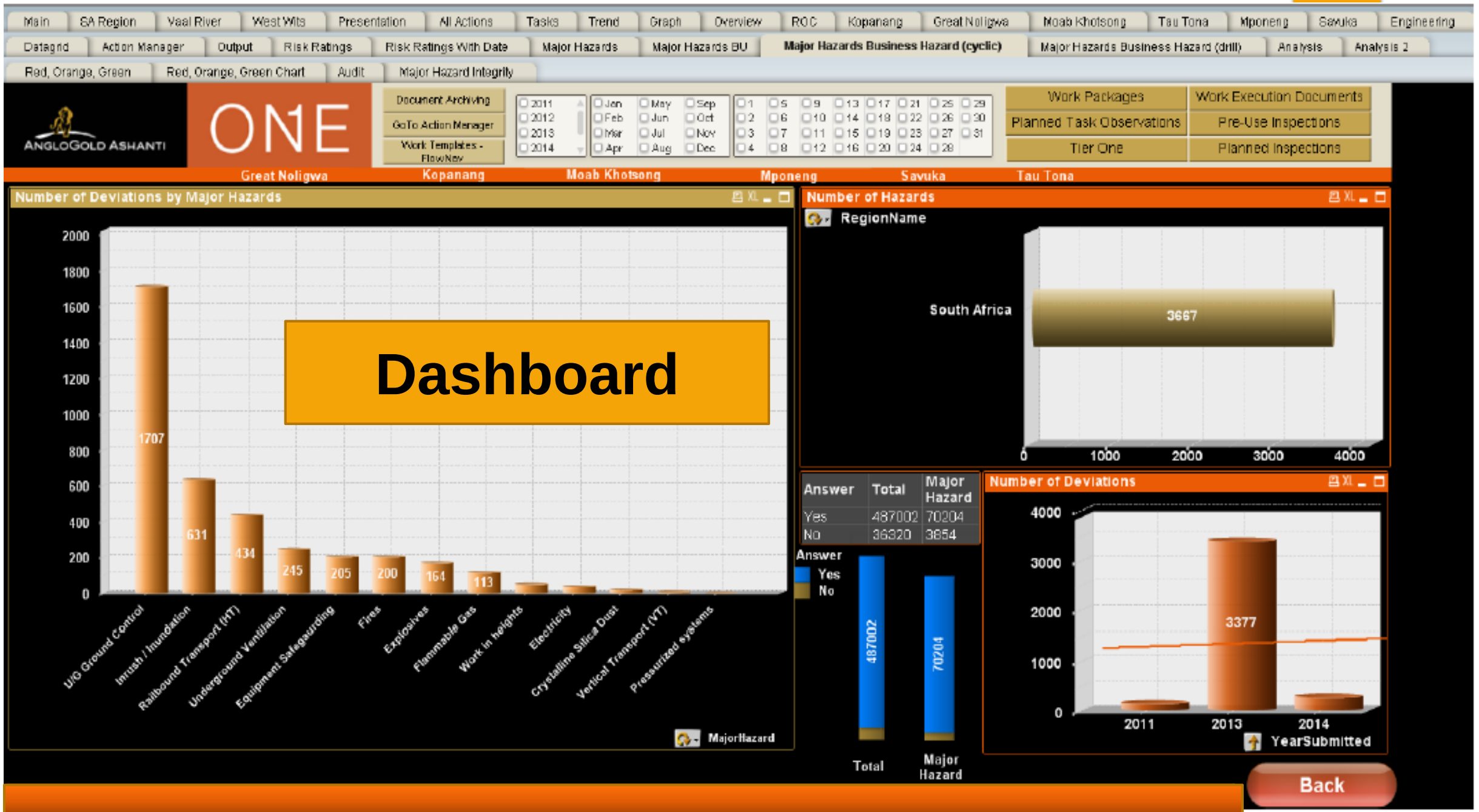
CC 2 verification activity 3

Critical Control

CCMP for Vehicle Collisions

Figure 1: The critical control management process




Main
SA Region
Vaal River
West Wits
Presentation
All Actions
Tasks
Trend
Graph
Overview
ROC
Kopanang
Great Noligwa
Moab Khotsong
Tau Tona
Mponeng
Savuka
Engineering
Datagrid
Action Manager
Output
Risk Ratings
Risk Ratings With Date
Major Hazards
Major Hazards BU
Major Hazards Business Hazard (cyclic)
Major Hazards Business Hazard (drill)
Analysis
Analysis 2
Red, Orange, Green
Red, Orange, Green Chart
Audit
Major Hazard Integrity
ANGLOGOLD ASHANTI
ONE
Document Archiving
GoTo Action Manager
Work Templates - FlowNav
Work Packages
Work Execution Documents
Planned Task Observations
Pre-Use Inspections
Tier One
Planned Inspections
Great Noligwa
Kopanang
Moab Khotsong
Mponeng
Savuka
Tau Tona
Number of Deviations by Major Hazards
2000
1800
1600
1400
1200
1000
800
600
400
200
0
1707
631
434
245
205
200
164
113
U/G Ground Control
Inrush / Inundation
Railbound Transport (HT)
Underground Ventilation
Equipment Safeguarding
Fires
Explosives
Flammable Gas
Work in heights
Electricity
Crystalline Silica Dust
Vertical Transport (VT)
Pressurized systems
MajorHazard
Dashboard
Number of Hazards
RegionName
South Africa
3667
0
1000
2000
3000
4000
Answer
Total
Major Hazard
Yes
487002
70204
No
36320
3854
Answer
Yes
No
487002
70204
Total
Major Hazard
Number of Deviations
4000
3000
2000
1000
0
3377
2011
2013
2014
YearSubmitted
Back

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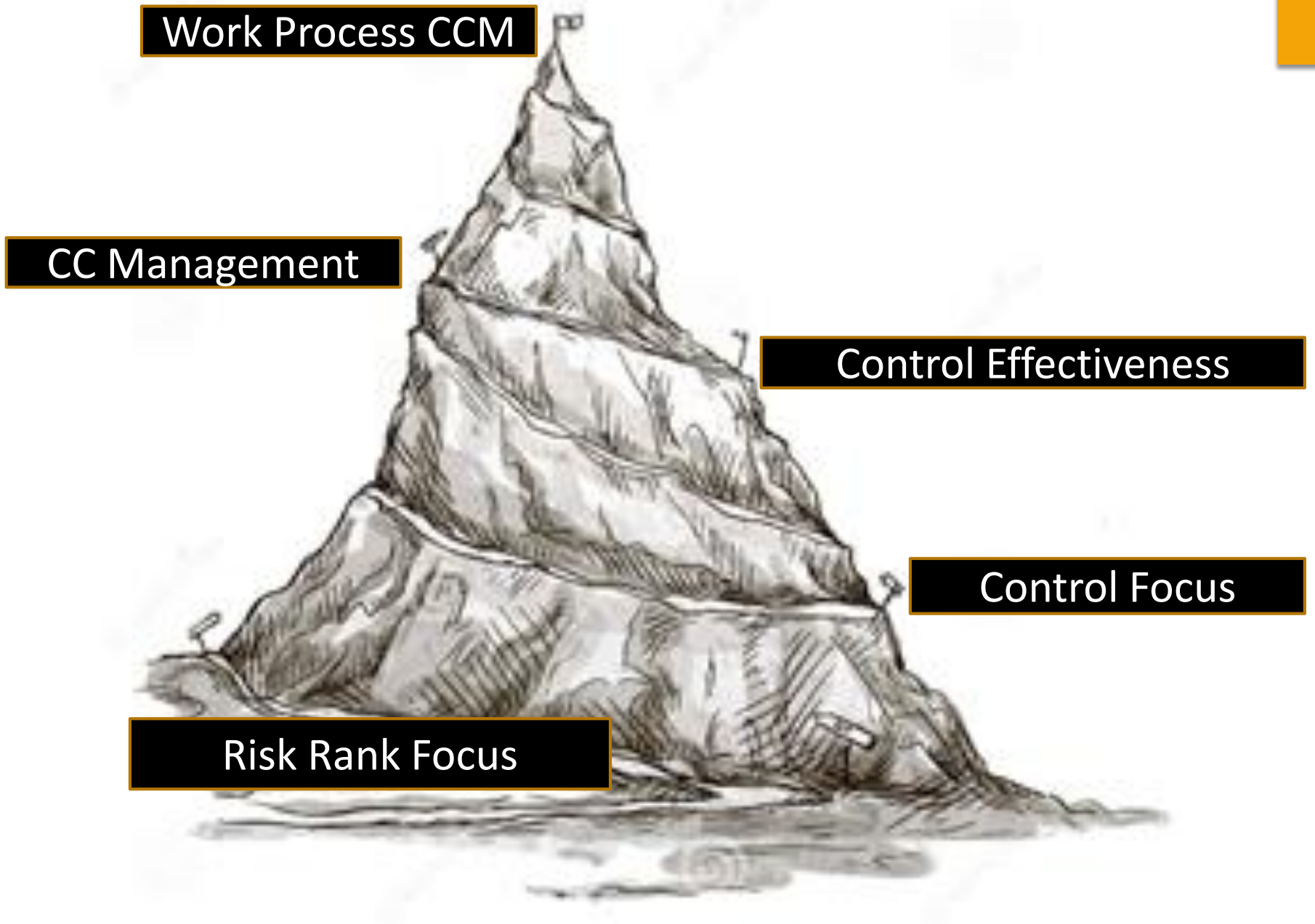

Work Process CCM
CC Management
Control Effectiveness
Control Focus
Risk Rank Focus

Figure A1: Summary illustration of the CCM journey model and mapping tool

GENERAL CHARACTERISTICS	LIMITED CONTROL FOCUS	CONTROL FOCUS	CRITICAL CONTROL FOCUS	CCM PLANNING	WORK PROCESS CCM
Leadership mindsets	Compliance	Compliance but support health and safety recommendations	Seeing value and appreciating the focus	CCM is driven by line leaders	CCM is an accepted, important part of the work process
Individual mindsets	Limited appreciation for the control focus	Limited appreciation for the critical control focus	Engaged in the process and some critical control understanding	Critical controls are an accepted focus	Work methods and CCM are the same
Finding the highest risk unwanted events	Basic historical or proactive methods for priority unwanted events	Systematic historical or proactive methods for priority unwanted events	Effective historical or proactive methods for MUEs	Proactive and lessons learned processes are combined to identify MUEs	Proactive and lessons learned processes identify MUEs
Analyzing controls and identifying the most critical	Controls noted to re-rank risk but no significant control dicussion	BTA applied to discuss controls and their effectiveness	Critical controls identified using BTA and effectiveness	Critical controls are identified with objectives and performance requirements	Identified critical controls include information for work process integration
Defining required control performance	No discussion of required control performance	No performance requirements defined	Control information defined, including accountability	Critical control performance requirements defined and the verification process	Integrated critical control information is in work process requirements
Embedding and managing controls	Limited, if any, embedding and monitoring of controls	Some informal or sporadic monitoring of controls	Some monitoring is defined and done for critical controls	All critical controls are systematically embedded and verified and status is reported	Verifying the work process includes critical controls
Improving controls	Sporadic actions related to controls, closeout limited	Improved action management but not well linked to controls	Deviations from critical control monitoring generate actions	Any deviations from the CCM planning expectations are investigated and actioned	Acting on deviations in work process includes critical control needs

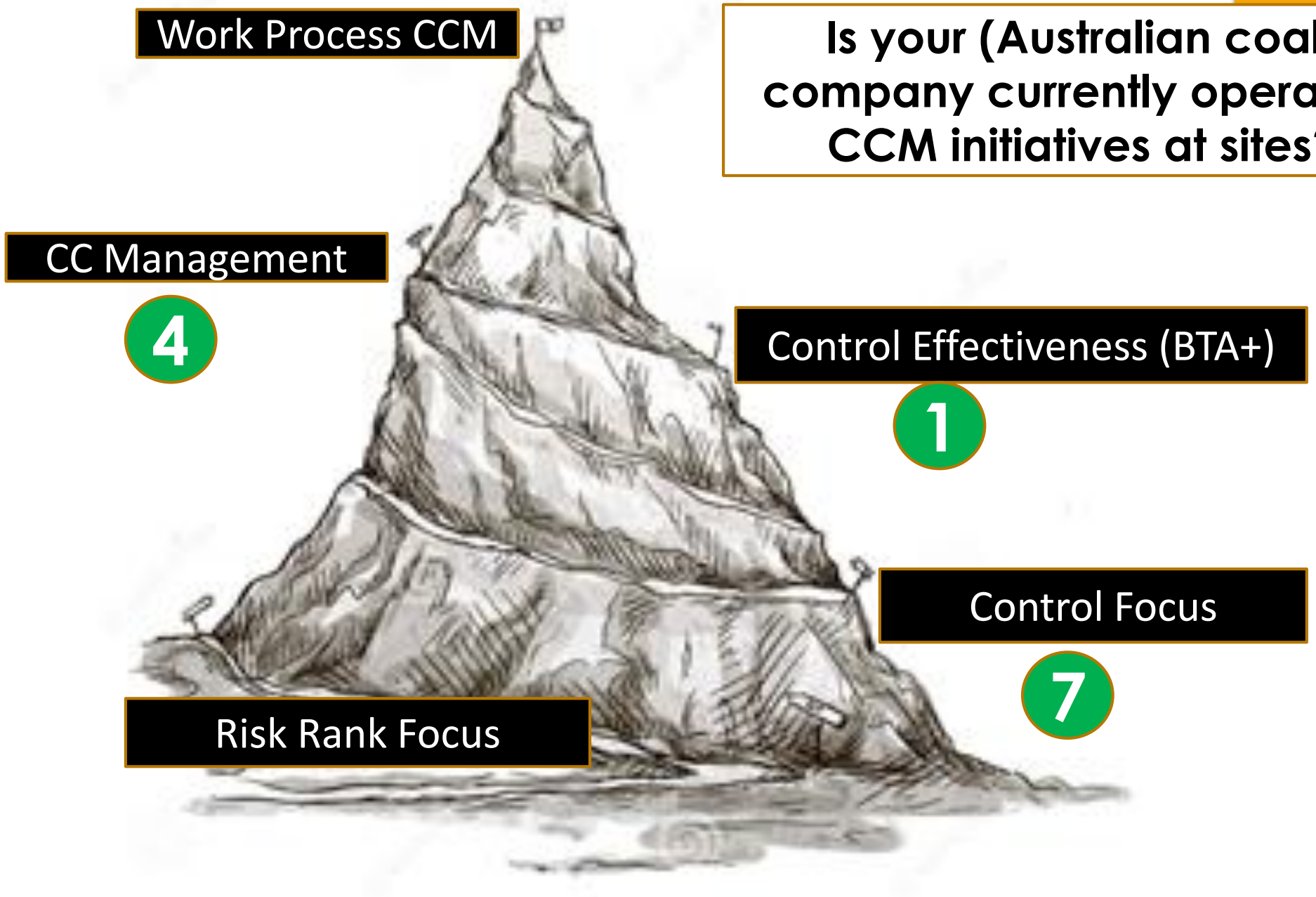
CCM Survey of 12 Australian Coal Mining Companies

6 large international miners, 2 large contractors, 4 moderate to small

Asked about

1. Interest in CCM? (11 very interested, 1 maybe)
2. Current status re CCM? – general, mindsets and process detail
3. Ideas to move CCM forward by 2020?

Is your (Australian coal) company currently operating CCM initiatives at sites?



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7 1 4

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Risk Identification & Prioritisation

12

Bowtie Analysis and Control Effectiveness

4

4

- **Site driven**
- **Seem OK with CC selection but….**
- **Systematic verification / reporting 'in progress'**
- **Incident investigation varies / so learning varies**

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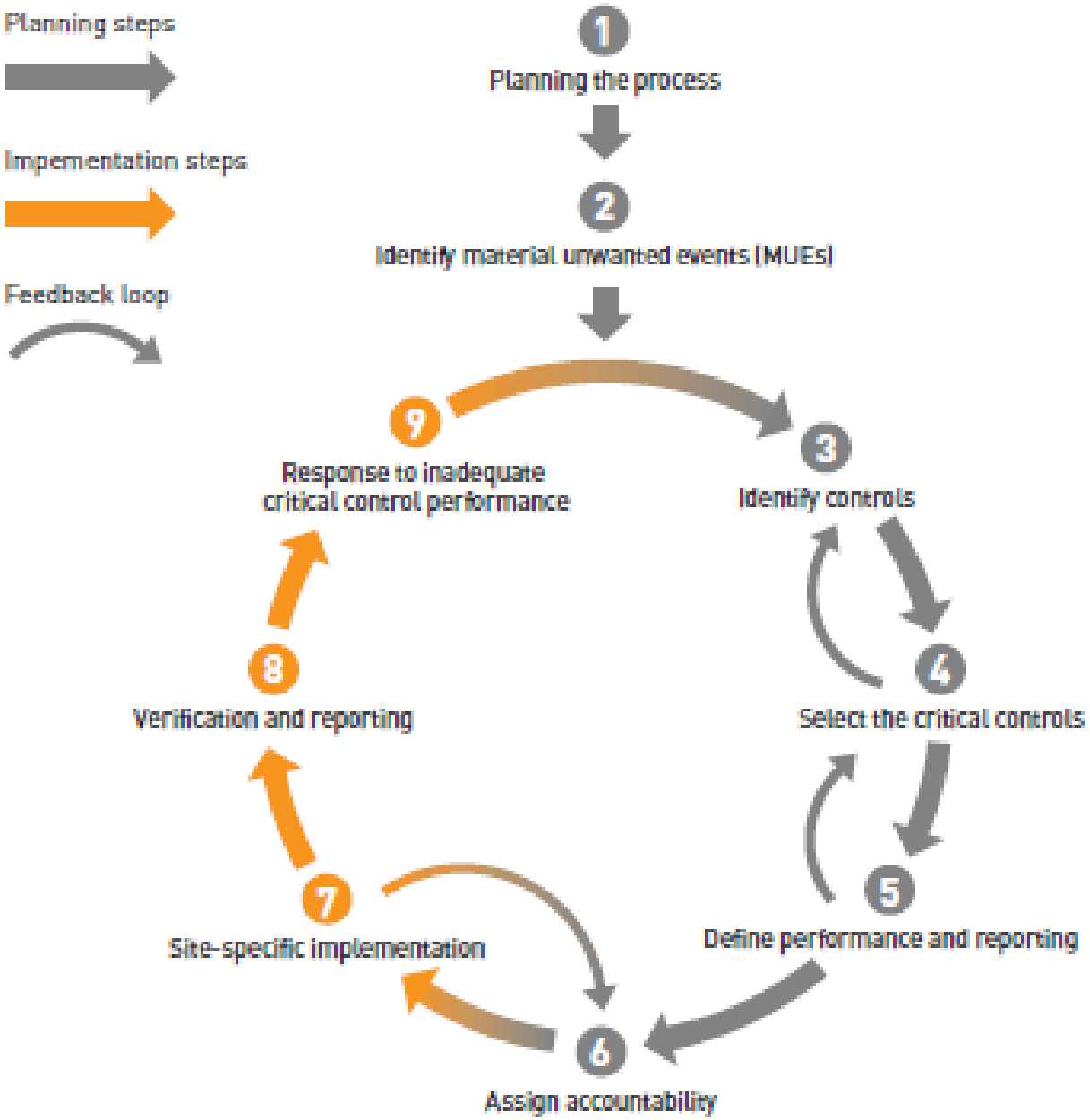

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