

# Critical Control Management in the resources industry

*Suggested focus areas to better manage our fatal risks*

**Christian Young | Managing Director | Impress Solutions**

# Question

- Who has Fatal Risks?
- Who has a CRM?
- Who is a Risk Owner?
- Who is a CC Owner?
- Under Control or Long Way to go?

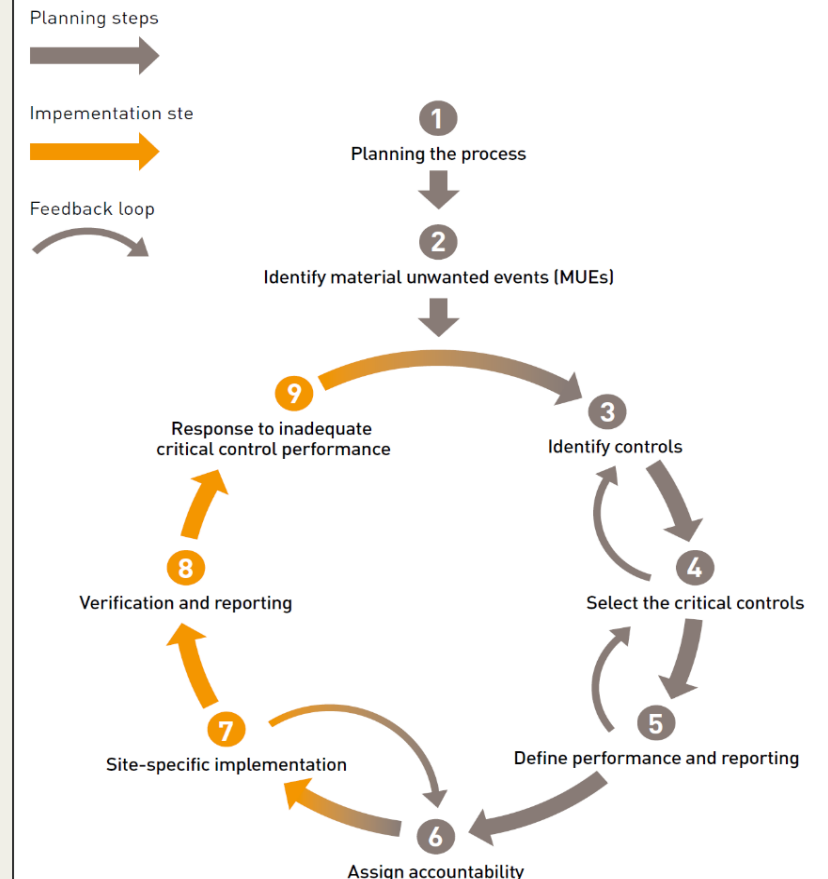




# Critical Controls Management Vs Critical Risk Management

- Critical Controls come from CRM.
- Good CRM = Good CC's
- Give as much info as I can
- 3 practical strategies

**Figure 1: The critical control management process**



# About me?



I help you save lives at work



# Separate the wheat from the chaff

Get absolute clarity on your Critical Risks

# Any of these sound familiar?

- Base Line Risk Assessment with hundreds of line items
- Confusion on what is a Critical Risk
- Too many critical risks
- Too few critical risks
- Uncertainty on what risks require a Critical Control?
- Incident causation does not match Critical Risk register
- Overwhelmed looking at their Baseline Risk Assessment

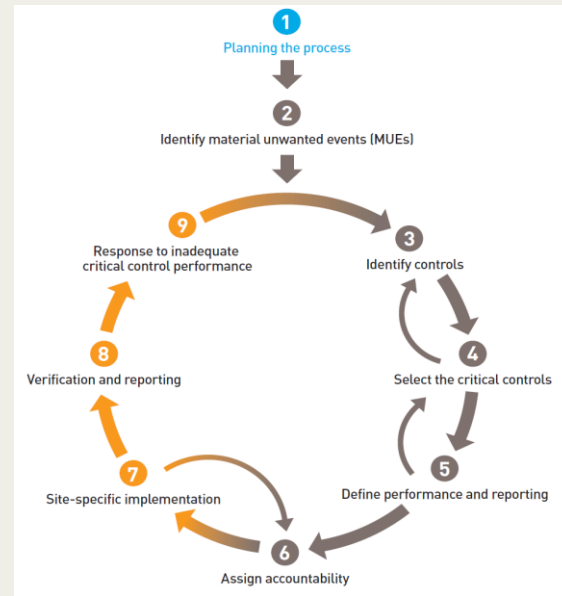
# Wouldn't it be nice if

- You have absolutely clarity on your Critical Risks.
- Your Base Line Risk Assessment contained only the most important risks for your business
- You had Critical Controls in place for only true Critical Risks



# All Risks

## Critical Risks



### Defining your Materiality Criteria

# Materiality Criteria

	Health & Safety	Environment	Financial Impact	Image & Reputation / Community	Legal & Compliance
<b>5 Catastrophic</b>	<ul style="list-style-type: none"> <li>Multiple fatalities (5 or more fatalities in a single incident)</li> <li>Multiple cases (5 or more) of Permanent Damage Injuries or Diseases that result in permanent disabilities in a single incident</li> </ul>	<ul style="list-style-type: none"> <li>Unconfined and widespread</li> <li>Environmental damage or effect (permanent; &gt;10 years)</li> <li>Requires major remediation</li> </ul>	<ul style="list-style-type: none"> <li>&gt;\$600M investment return</li> <li>&gt;\$100M operating profit</li> <li>&gt;\$20M property damage</li> </ul>	<ul style="list-style-type: none"> <li>Loss of multiple major customers or large proportion of sales contracts</li> <li>Security incident resulting in multiple fatalities or major equipment damage</li> <li>Formal expression of significant dissatisfaction by government</li> <li>Grievance from internal or external stakeholder alleging human rights violation resulting in multiple fatalities</li> </ul>	<ul style="list-style-type: none"> <li>Major litigation / prosecution at corporate level</li> <li>Nationalisation / loss of licence to operate</li> </ul>
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**Material Consequences** will be included within the BBRA

**Materiality Threshold**

**Immaterial Consequences** will not be included within the BBRA  
Managed via other Risk Management (WRAC, JSA, SLAM)

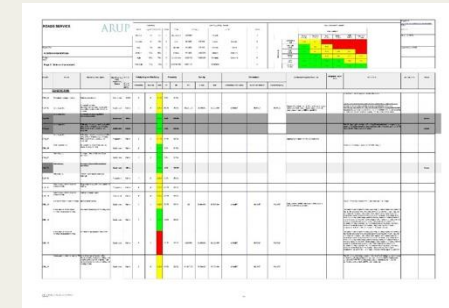
# All Risks

# BBRA Risks

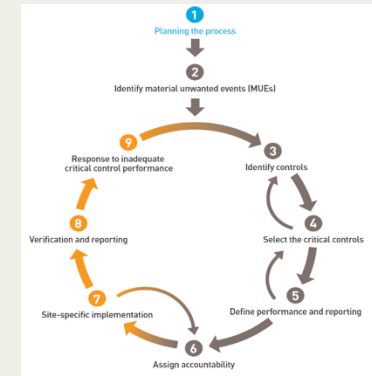
# Critical Risks

Category	Health & Safety	Environment	Process Safety	Legal & Regulatory Compliance	Asset & Operations
Construction	1. Safety of workers and the public 2. Environmental protection 3. Quality of workmanship 4. Compliance with regulations	1. Environmental protection 2. Compliance with regulations	1. Safety of workers and the public 2. Environmental protection 3. Quality of workmanship 4. Compliance with regulations	1. Compliance with regulations 2. Safety of workers and the public 3. Environmental protection 4. Quality of workmanship	1. Safety of workers and the public 2. Environmental protection 3. Quality of workmanship 4. Compliance with regulations
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ARUP Risk Register Table showing various risk categories, descriptions, and risk levels. Includes a color-coded risk matrix in the top right corner.



# To summarise

Using Materiality Criteria to define BBBA risks and Critical Risks is one of the secrets to successful CRM

	Health & Safety	Environment	Financial Impact	Image & Reputation / Community	Legal & Compliance
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# **Not all controls are equal**

Look around for controls and evaluate what you have

# Any of these sound familiar?

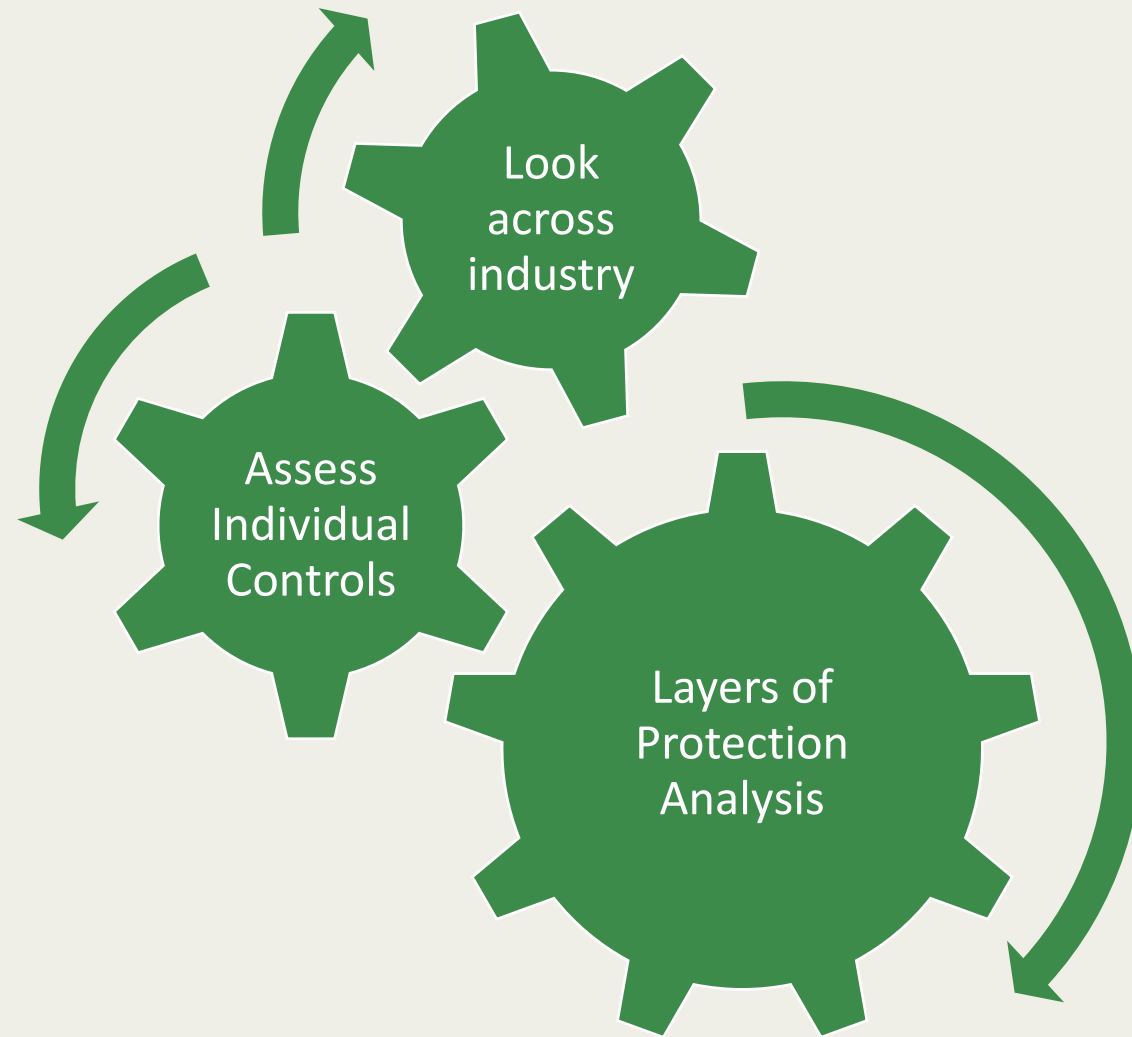
- Copy the same controls as previous BLRA
- Controls identified by people in the room only?
- Did you only look inside your business to identify controls for Critical Risks?
- There are few if any new controls identified?



**Do you have all the  
controls?**

# Wouldn't it be nice if

- You had confidence you have identified all possible controls for each Critical Risk
- Your control suite improved with technology advancements



# Where to look

- Risk gate
- Tyre Gate
- Earth Moving Equipment Safety Round Table (EMESRT)
- Regulator databases
- Past industry conferences for innovation awards
- Industry groups
- Informal networks
- Talk to Impress Solutions!



# Assess Individual Controls

CONTROL QUALITY		No object/technology component to control	Coverage, availability and reliability of OBJECT/TECHNOLOGY component of control				
			Works in >95% of scenarios/areas	Works in 90%-95% of scenarios/areas	Works in 75%-90% of scenarios/areas	Works in 50%-75% of scenarios/areas	Works in <50% of scenarios/areas
No human action component to control			Excellent	Very Good	Good	Poor	Very poor
Coverage, availability and reliability of HUMAN ACTION component of control	Works in >95% of scenarios/areas	Excellent	Excellent	Very Good	Good	Poor	Very poor
	Works in 90%-95% of scenarios/areas	Very Good	Very Good	Good	Good	Poor	Very poor
	Works in 75%-90% of scenarios/areas	Good	Good	Good	Poor	Poor	Very poor
	Works in 50%-75% of scenarios/areas	Poor	Poor	Poor	Poor	Very poor	Very poor
	Works in <50% of scenarios/areas	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor

CONTROL EFFECTIVENESS		CONTROL IMPACT - Degree to which the control impacts residual risks				
		Significant impact	Impact	Slight impact	No impact	Adverse impact
		Presence/action of control <b>significantly reduces</b> residual risk. Absence/failure of control <b>significantly increases</b> the residual risk	Presence/action of control <b>reduces</b> residual risk. Absence/failure of control <b>increases</b> the residual risk	Presence/action of control <b>slightly decreases</b> the residual risk. Absence/failure of control <b>slightly increases</b> the residual risk	Presence/action or absence/failure of the control <b>does not change</b> the residual risk	Presence/action of control has potential to <b>increase</b> residual risk
CONTROL QUALITY from matrix one	Excellent	Highly adequate	Very good adequacy	Marginally adequate	Poor adequacy	Inadequate
	Very Good	Very good adequacy	Very good adequacy	Marginally adequate	Poor adequacy	Inadequate
	Good	Very good adequacy	Very good adequacy	Marginally adequate	Poor adequacy	Inadequate
	Poor	Marginally adequate	Marginally adequate	Poor adequacy	Inadequate	Inadequate
	Very poor	Poor adequacy	Poor adequacy	Inadequate	Inadequate	Inadequate

Source: M. Hassall, J. Joy, C. Doran and M. Punch, Selection and Optimisation of Risk Controls. ACARP report no C23007, 2015.





# To summarise

Looking outside in the identification of controls, and evaluating your controls is one of the secrets of a successful CRM.

# Are your Critical Controls ready to Perform?

Defining critical control performance ensures control performance

# Any of these sound familiar?

- Critical Controls aren't effective
- Critical Controls effectiveness erodes over time
- Perform adhoc checks on Critical Controls at best
- Critical Controls are a mystery to the front line
- Confusion as to who is responsible for maintaining the Critical Controls
- Unsure what to do if the Critical Controls fails

# Wouldn't it be nice if


- Everyone new their Critical Control responsibilities
- You knew how each Critical Control could fail and what you can do to stop this
- You had clear reporting on the effectiveness of your Critical Controls

How do we get there?

# **Critical Control Performance Standards**

# Critical Control Performance Standard

A document (or structured set of data) which defines the performance required of each Critical Control



CRITICAL CONTROL PERFORMANCE STANDARD				
				Assigned Owner
<b>Critical Control</b>				
<b>Material Unwanted Event</b>				
<b>Critical Control Objective</b>				
<b>Critical Control Type</b>				
<b>Performance Requirement</b>				
Performance Parameter	Requirement	Activities that ensure performance requirement is delivered	Management System requirement to ensure performance requirement completion	Assigned Owner of Performance Requirement
Functionality: <i>How the control performs in order to achieve the required risk reduction (combination of action + value)</i>				
Timing: <i>For Object type controls what is the input or signal to the object that initiates application? For Act type controls, when is it required to occur? What is the input or signal to the person(s) that initiates the act</i>				
Availability: <i>Percentage of time that CC is capable of performing its function? (operating time + stand by time)x</i>				
Reliability: <i>The probability that at any point in time CC will operate correctly for a further specific length of time</i>				
Survivability: <i>Whether or not the control is able to survive a damage event. Relevant for mitigation CC's</i>				
Dependency: <i>The degree of CC reliance on other systems in order for it to be able to perform its intended function.</i>				



# Performance standard elements

Define performance requirements for:

- **Objective:** What is the Purpose of the CC
- **Functionality:** How the CC performs in order to achieve the required risk reduction
- **Availability:** Percentage of time that CC is capable of performing its function
- **Reliability:** Probability that at any point in time CC will operate correctly
- **Survivability:** Ability of CC to survive a damage event
- **Dependency:** Degree of reliance on other systems for it to perform.
- **Compatibility:** Compatibility with existing controls
- **Redundancy:** Mechanisms to perform similar function should CC fail

# Performance standard elements

Other requirements

- **Performance Trigger:** Criteria that will trigger shutdown, critical control review or investigation
- **Verification Activities:** Activities that can be checked to verify critical control performance (Monitoring Activities)
- **Failure Mechanisms:** What can cause the degradation of the control or failure of the control
- **Failure Prevention Strategies:** Strategies that mitigate control failure or degradation
- **Control Effectiveness Assessment:** How effectiveness will be measured

# Performance standards are not enough!!!

industry? This study analyzed 10 years of serious and fatal incident investigation reports from four international construction companies to (i) assess the reliability of their Critical Controls (CCs) and (ii) assess the factors that affect the reliability of CCs. The results show the reliability of CCs, measured by implementation and effectiveness, averaged just 42%. Insight into human performance

Source - Selleck, R.; Hassall, M.; Cattani, M. Determining the Reliability of Critical Controls in Construction Projects. Safety 2022, 8, 64.

critical controls were assumed to be operating effectively. Unfortunately, there was plenty of other evidence that these controls were *not* operating effectively, specifically large numbers of exceedances, but this was not regarded as relevant. What appears to have happened was that the monitoring of critical controls was treated as routine bureaucratic process and, provided this yielded satisfactory results, nothing else seemed to matter.

Source – Andrew Hopkins | March 2023 | Managing the Risk of Major Accidents – Lessons from Anglo American’s Grosvenor mine accident

# To summarise

Developing Critical Control Performance Standards for each Critical Control is one of the secrets to a successful CRM program.

# Recap

- Using Materiality Criteria to define BBBA risks and Critical Risks is one of the secrets to successful CRM
- Looking outside in the identification of controls, and evaluating your controls is one of the secrets of a successful CRM.
- Developing Critical Control Performance Standards for each Critical Control is one of the secrets to a successful CRM program.



# What next

- Review your Critical Risk Management Strategies and resourcing plans.
  - The CRM Work required is more than you currently have capacity to undertake.
- Update your Broad Brush to ensure it only includes material risks.
- Ensure Control effectiveness Assessments are performed within Bowtie Analysis.
- Consider layers of protection analysis as a prompt to identify any additional controls.
- If you don't have performance standards on Critical Controls – start.
- If you do have Performance Standards – consider the requirements outlined by this presentation.
- Confirm your Critical Controls are in all of the places they need to be.

# Join our next CRM Masterclass



- Wed 3<sup>rd</sup> & Thurs 4<sup>th</sup> May | Brisbane
- For more information scan QR code



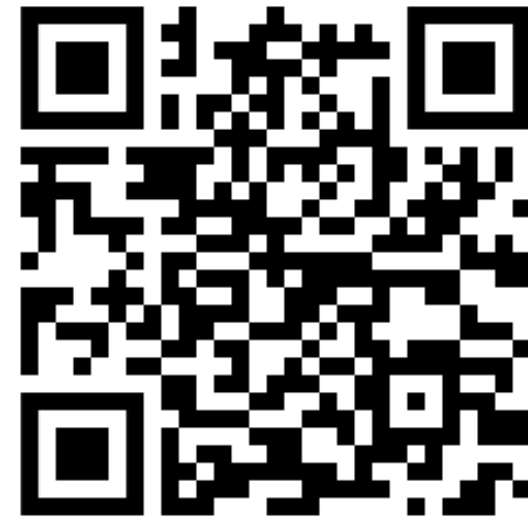


# Questions

Christian's contact details



Next CRM Masterclass



**THANKYOU!**