From Insight to Action:

LEVERAGING ANALYTICS FOR SIF PREVENTION IN MINING

Incident Analytics™

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Your Host

Alex Fernando

CHIEF STRATEGY OFFICER AND HEAD OF RISK ADVISORY

Alex is an experienced business leader and management consultant with experience across a diverse range of high-risk industries, including mining, ports, manufacturing and utilities sectors. He has several years in safety and business improvement initiatives including large scale workforce development, critical risk management, incident analytics, governance and assurance programs. Alex is well known for his systems thinking and highly collaborative approach to co-develop sustainable programs that positively impact organisations and reduce exposure in high-risk contexts.

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ACKNOWLEDGEMENT OF COUNTRY

Sentis acknowledges the traditional custodians throughout Australia and recognises their connections to land, waters and community.

We acknowledge the Traditional Owners of the land on which we meet today and pay our respects to elders past and present. We extend that respect to Aboriginal and Torres Strait Islander peoples here today. We do this because we value Aboriginal and Torres Strait Islander history, culture and knowledge.

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Our Mission

To change the lives of individuals and organisations for the better, every day.

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OUR EXPERIENCE

- ✓ *Over 180,000 participants*
- ✓ *400 + Organisations*
- ✓ *40 Countries*
- ✓ *Broad industry experience*
- ✓ *Dedicated team of Organisational Psychologists*
- ✓ *Deep expertise in critical risk management*

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Agenda

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Our Approach

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Our Approach

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“Safety is not the absence of accidents. Safety is the presence of defenses.”

— DR TODD CONKLIN

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Yin & Yang

Yin and yang (English: /jɪn/, /jæŋ/), also yinyang[or yin-yang,is a concept that originated in Chinese philosophy, describing opposite but interconnected, mutually perpetuating forces.

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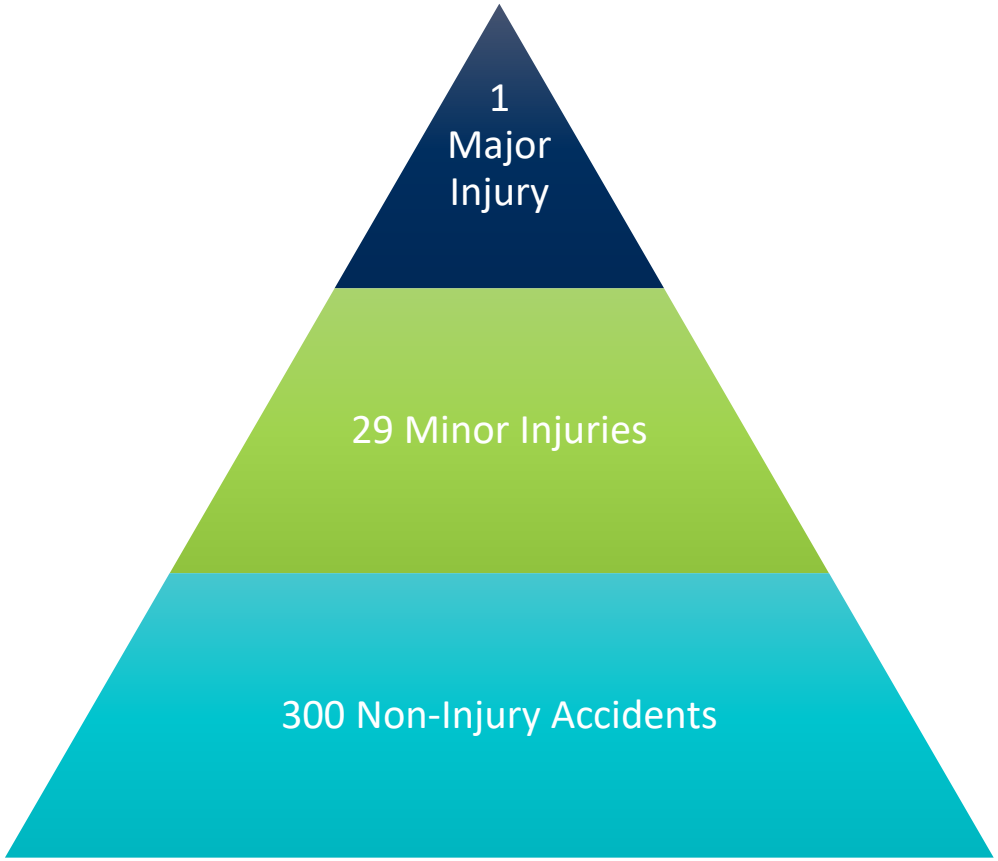
Recordable Incidents

- Many schools of thought (i.e. Zero Harm)
- Randomness of data
- Heinrich's Safety Triangle

BUT there is value in learning from lag data such as recordable injuries



HEINRICH'S SAFETY TRIANGLE

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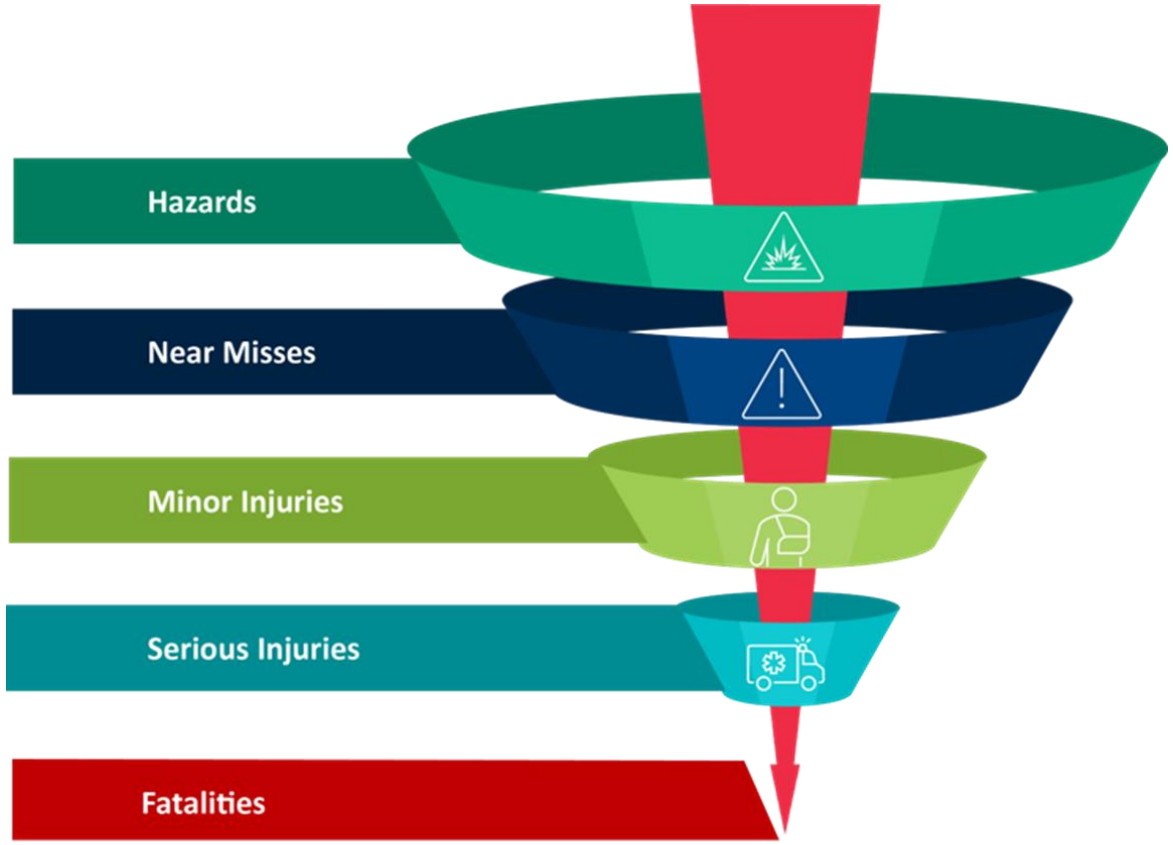
Learning from SIFp events

- What is a SIFp?
- A healthy culture of reporting is critical to enable organizational learning
- Industry study
  - TRIFR reducing but rate of SIF incidents increasing
  - found that up to 20% of all incidents have the potential to be a SIF.
- Use as a leading indicator for exposure to SIFp and enhancing critical control management



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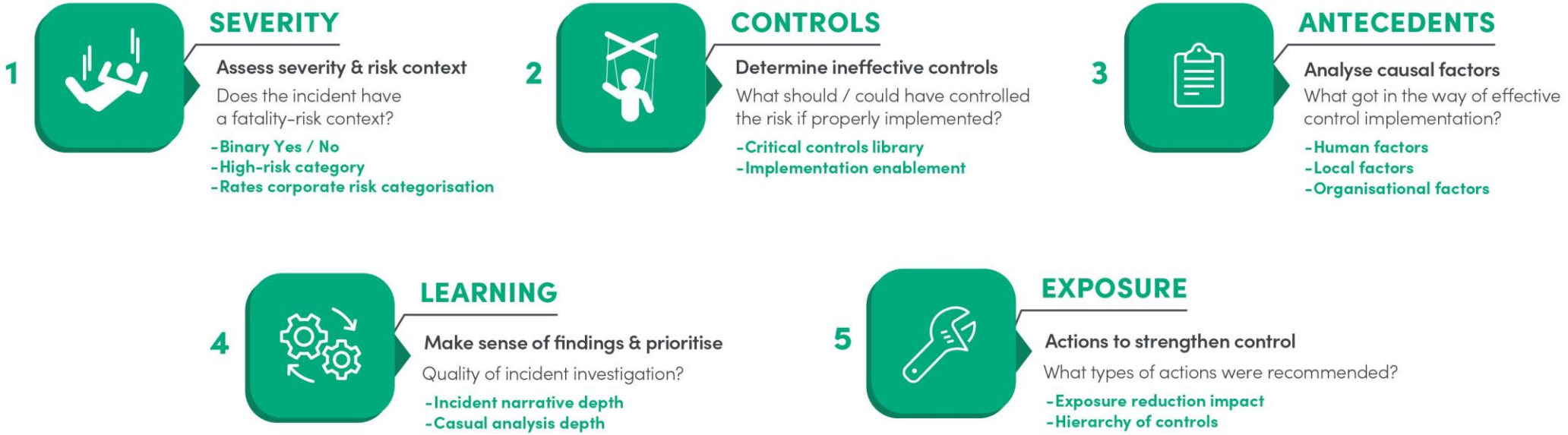
To see one of our related case studies, scan the QR code or visit **sentis.com.au/utilities-case-study**

Meta Incident Analysis™

The **Meta Incident Analysis™** approach is underpinned by a contemporary causal analysis framework called SCALE®. This enables a comprehensive and repeatable approach to understand opportunities to improve high risk work through strengthening (critical) controls, human factors as we all as broader organisational and system factors.



Incident Analytics™

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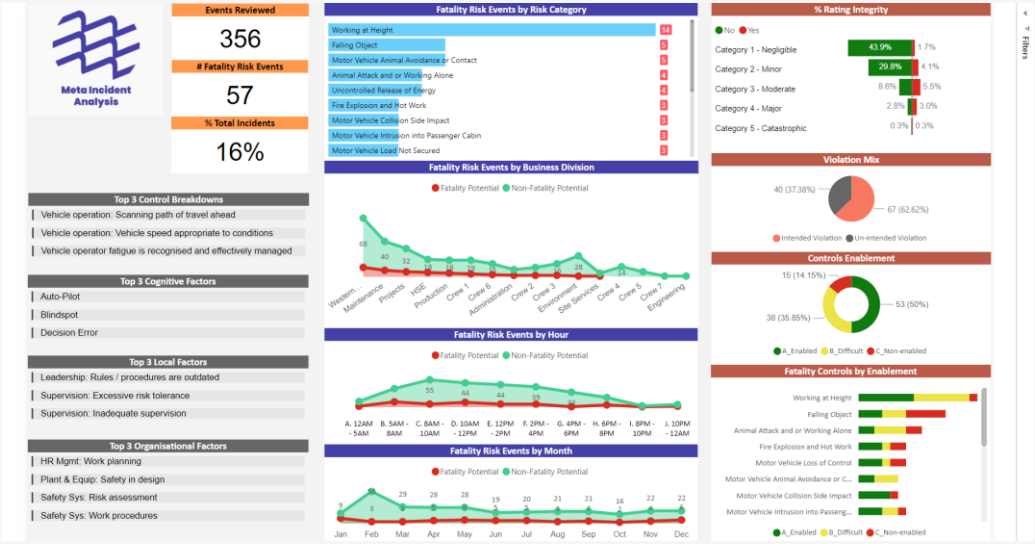
Analytics Dashboard

We perform a structured and comprehensive analysis of your incidents and near miss events to provide dashboard reporting and drill-down data analysis via a customised PowerBI interface:

- SIF risk category and incident frequency
- Critical control integrity and enablement within risk categories
- Contributing factor analysis (human, operational and organisational factor)
- Investigation Quality and Action Assessment
- Chronological and geographical analysis



Incident Analytics™

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Client Context

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What Was Analysed

659 incidents and near miss events from 2018 to early 2023 were reviewed for severity potential.

93 incidents were considered potential Serious Injury & Fatality (SIF) events and were then subject to detailed analysis.

Triangulate with Safety Climate Diagnostics, Critical Risk System Reviews

Poll

WHAT PROPORTION OF YOUR INCIDENTS COULD BE, IF NOT FOR LUCK, A SIFP INCIDENT?

1. 1 in 2 (50%)
2. 1 in 3 (33%)
3. 1 in 4 (25%)
4. 1 in 5 (20%)
5. 1 in 10 (10%)
6. 1 in 20 (5%)

Unpacking the Data

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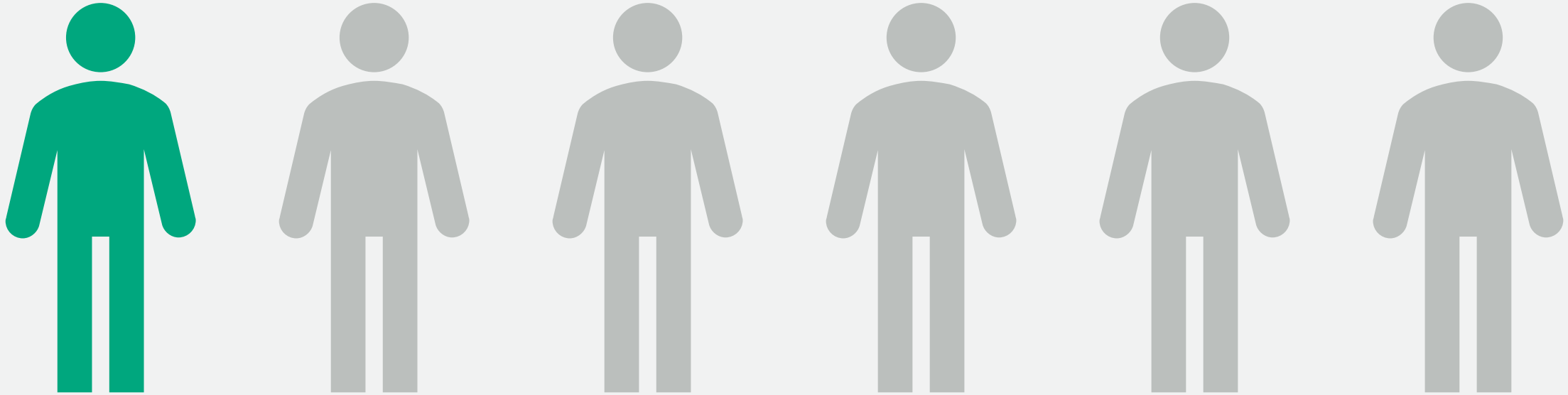
In 2018,



1 in 6 incidents had serious injury fatality potential

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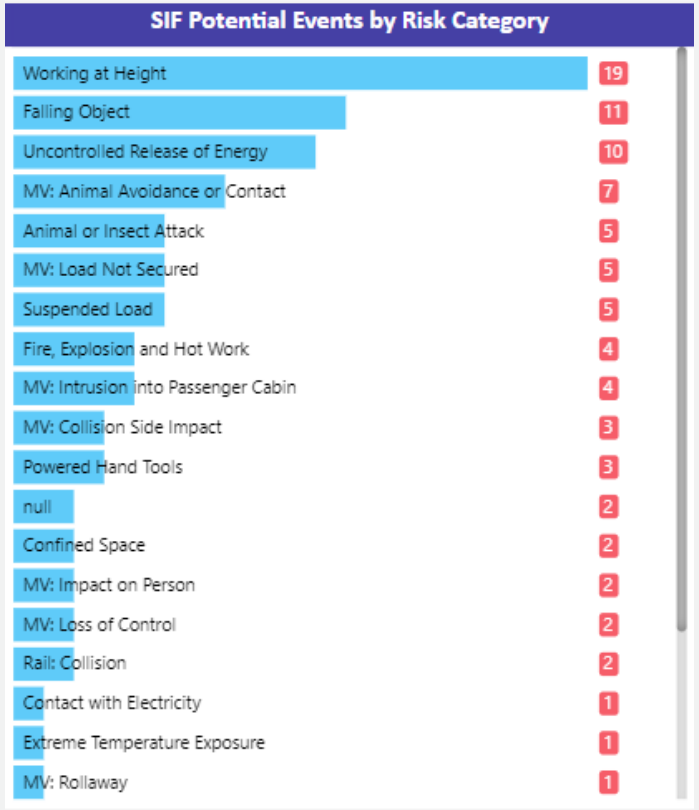
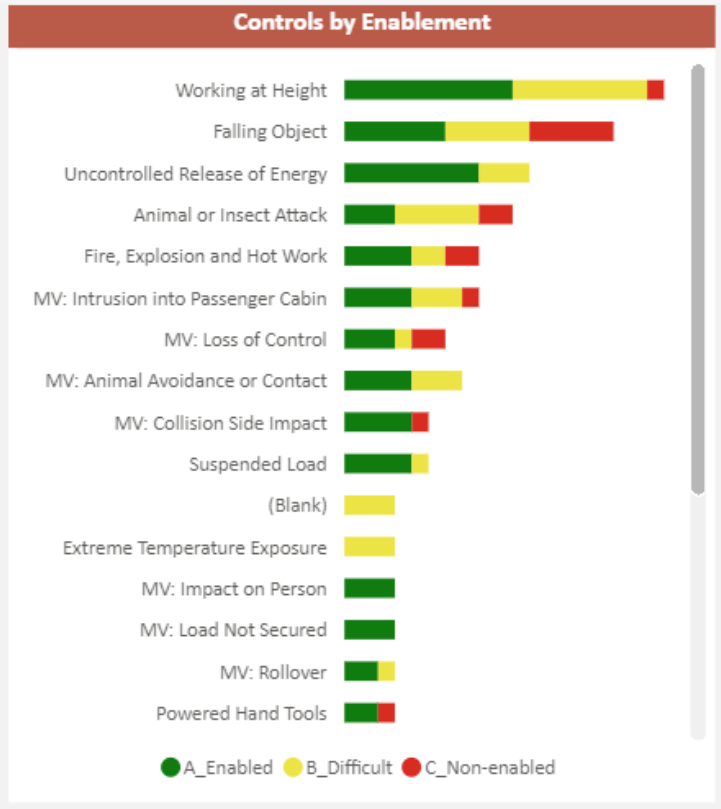
High Risk Work Exposure

1. Working at Height
2. Falling Object
3. Motor Vehicle
4. Uncontrolled Release of Energy





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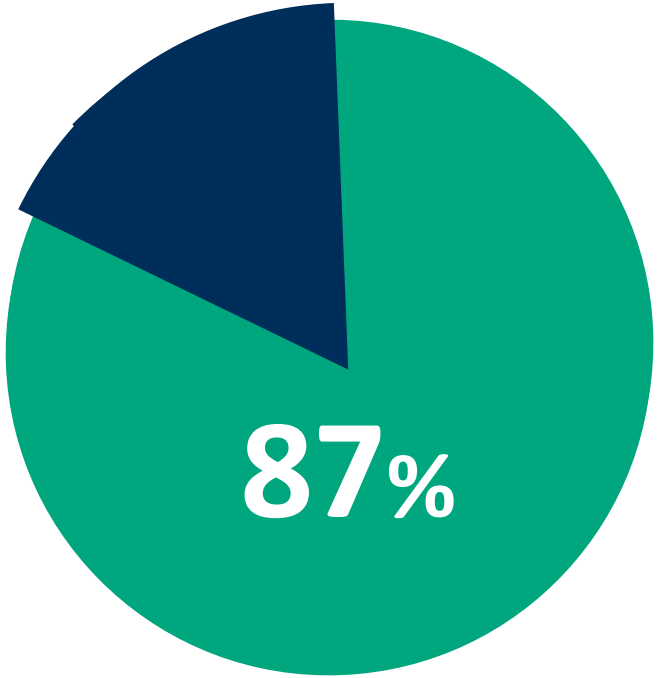
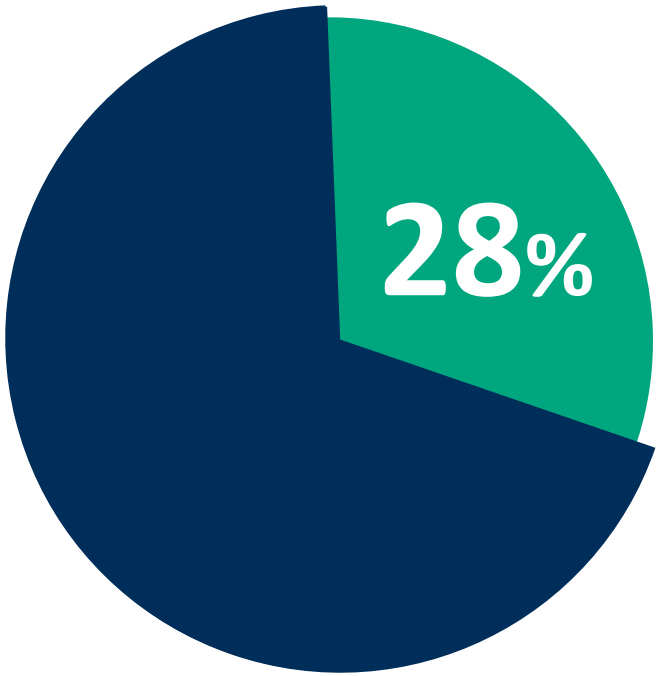
Categorisation

% of SIFp incidents internally rated **Low/Moderate risk**



Risk matrix approach to internal rating of severity potential underplays the real risk, which means many incidents fly under the radar.

% of incidents rated **High or Major Risk were non-SIFp**



On the flip side, several incidents may have been over-emphasised or attracted unwarranted attention and/or investigation depth.

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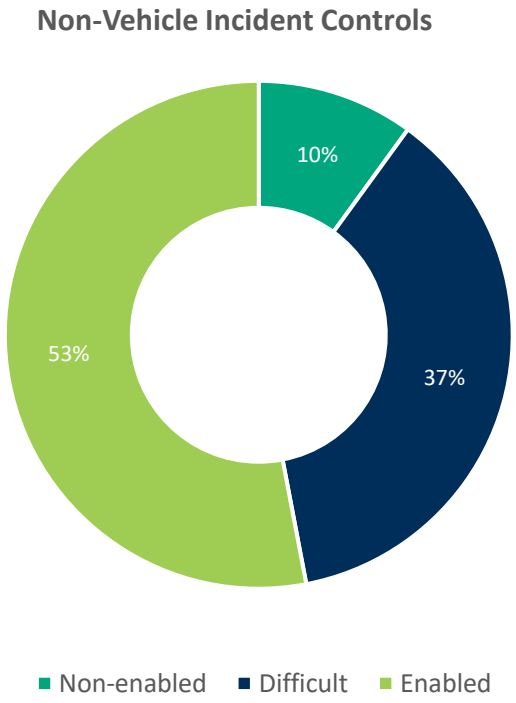
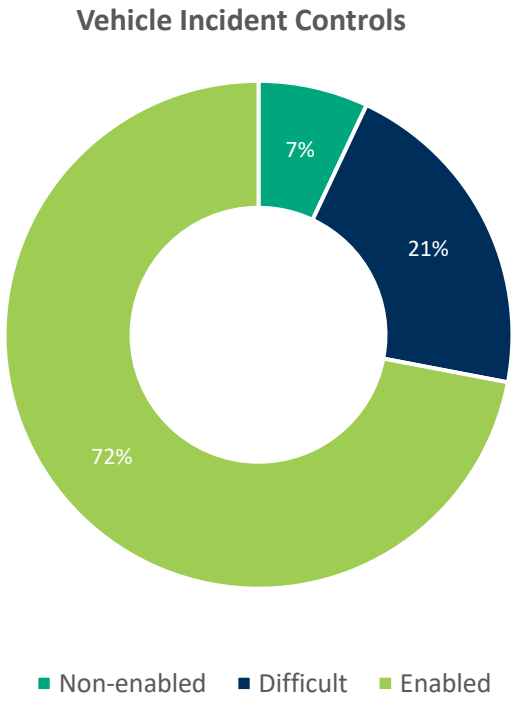
Control enablement



52 of 110 SIF incidents involved some degree of control implementation.



16 of 57 SIF incidents involved some degree of control implementation difficulty.

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Client Strategy

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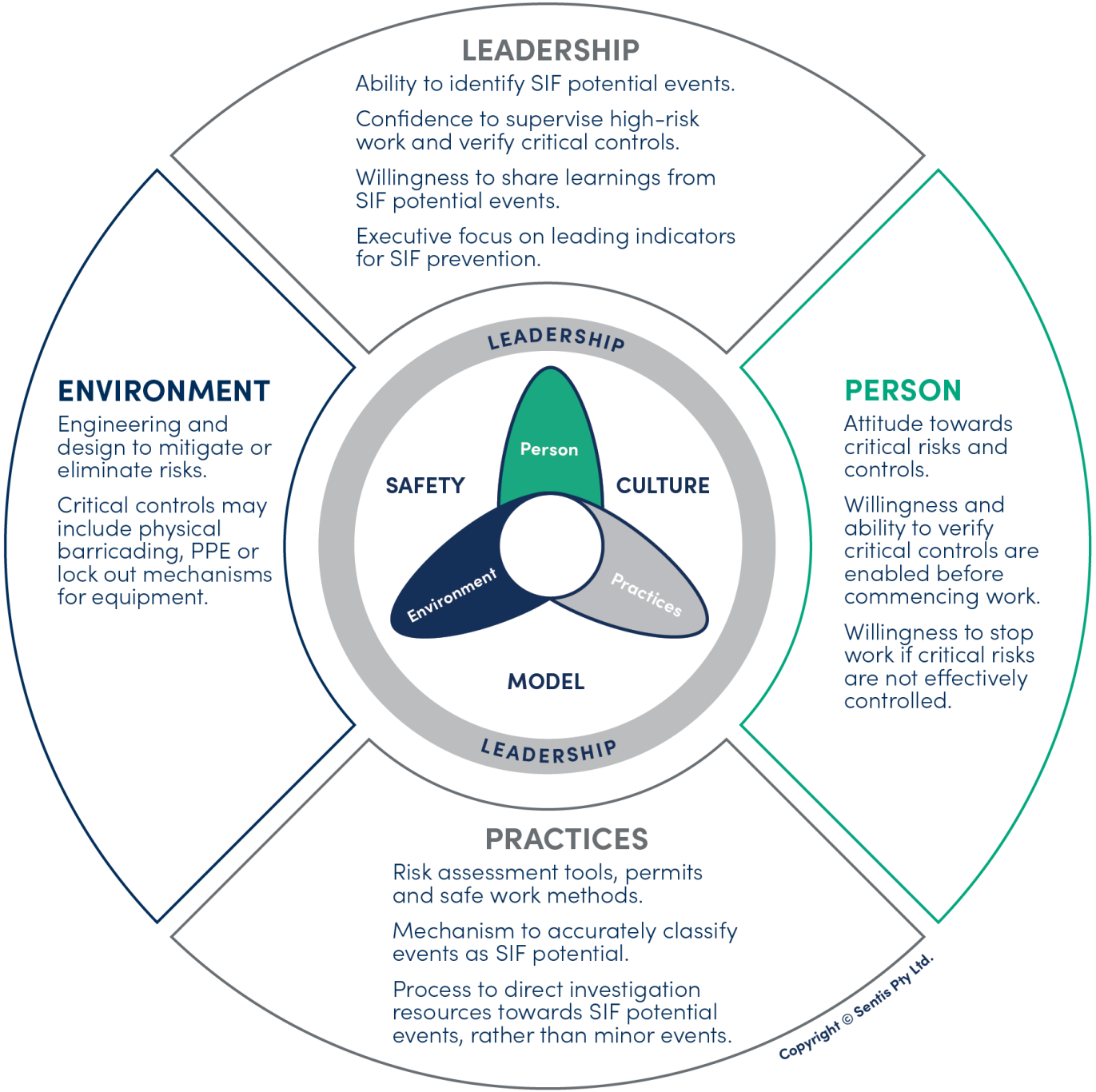

THE SAFETY CULTURE MODEL & CRM SYSTEM

To learn more about the Safety Culture Model, scan the QR code or visit **sentis.com.au/articles/understanding-safety-culture/**

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What did the organisation do?

- Redesign their Critical Risk Framework
- Bow Tie Workshops
- Enhanced Critical Control Performance Standards
- Increase role clarity and engagement of workforce
- Introduced new leading indicators
- Provide coaching in the field
- Assurance of the data reporting to increase reliability

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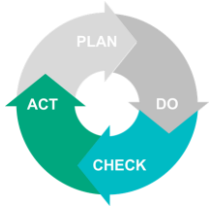
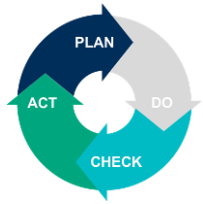
Focus on Improving Effectiveness of Critical Controls

The CRM System by Roles & Actions

WHO	SYSTEM	WHAT	HOW
Crew / Contractors		Implements controls task-by-task (***Have I…?***)	JSA, Permit, SWMs, SLAM
Front line leaders		Verify controls are in place and effective shift-by-shift (***Has my team…?***)	Critical Control Verifications (CCV) & Pre-starts
Leaders / Risk Owners		Owns the risk and evaluates the controls (***Have we…?***)	Critical Control Deep Dives, CCV, Audit
H&S team		CRM support to operations	All tools

Did we set our team up for success?

ENABLED: did they have the procedures, knowledge, skills, equipment and work environment to effectively implement the critical controls?

DIFFICULT: can the task be controlled but takes extra effort or increased resources? Are the local conditions and operating context prompting a ‘work around’?

NON-ENABLED: is it reasonable to expect the person to be able to control the risk is the context of local or organisational factors?

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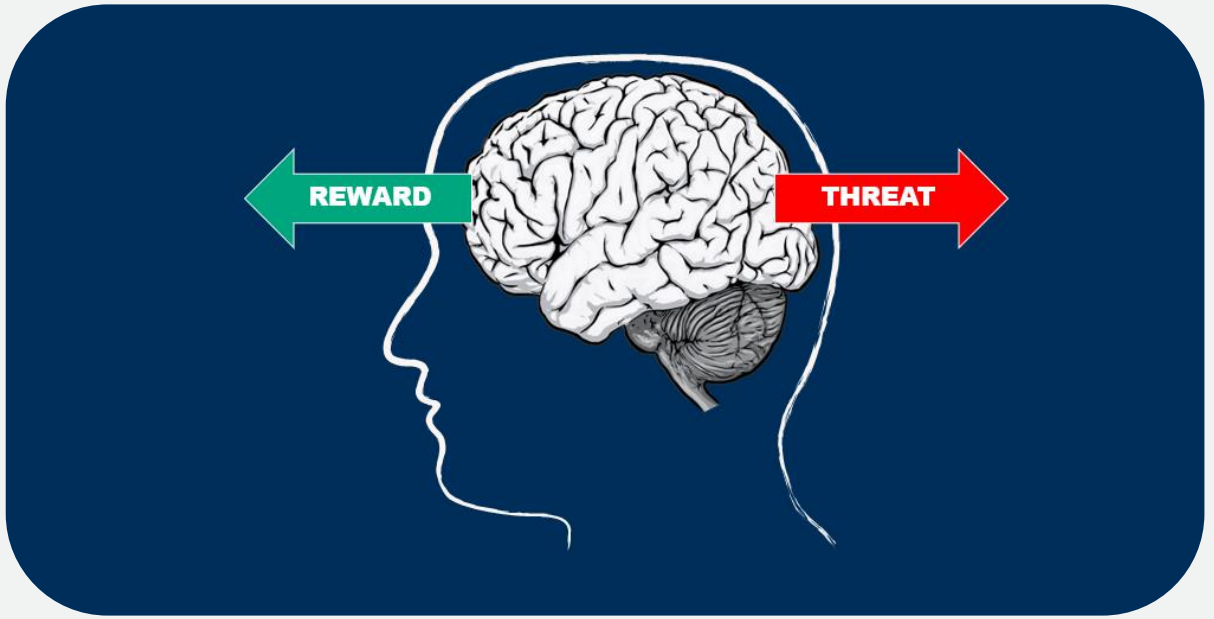
What ‘threat’ frames might exist?

- What are the frames your teams may have around CRM in general?
- How might your team members be framing the possible outcomes of CCVs?



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Key brain limitations that may impact the team

Autopilot

Blind Spots

Cognitive Bias

Fatigue

"..to err is human.."

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Critical Control Verifications

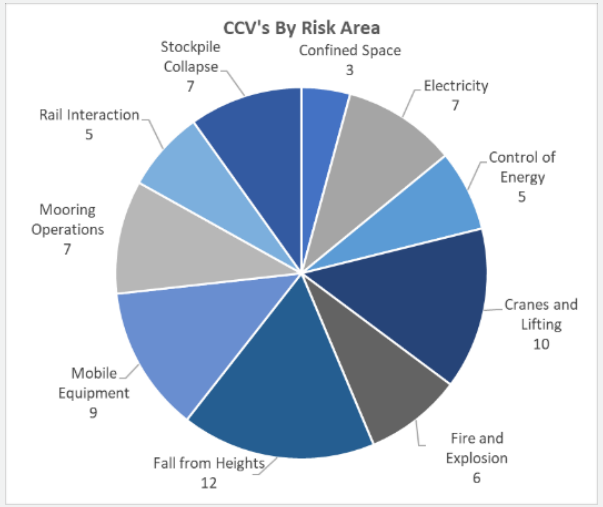
71
CCV's Completed

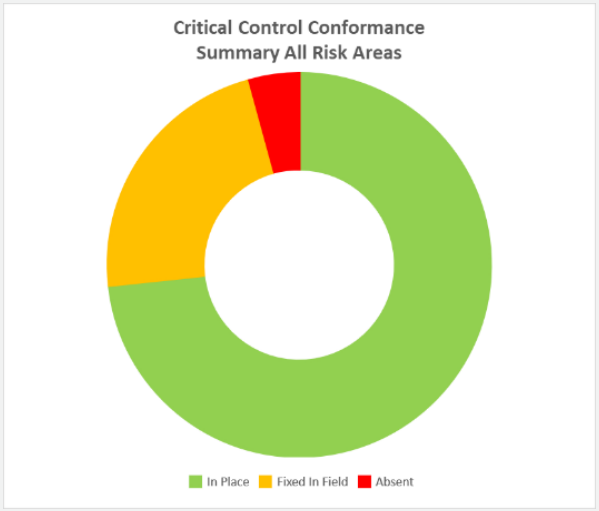
92
% Scheduled CCV's Completed

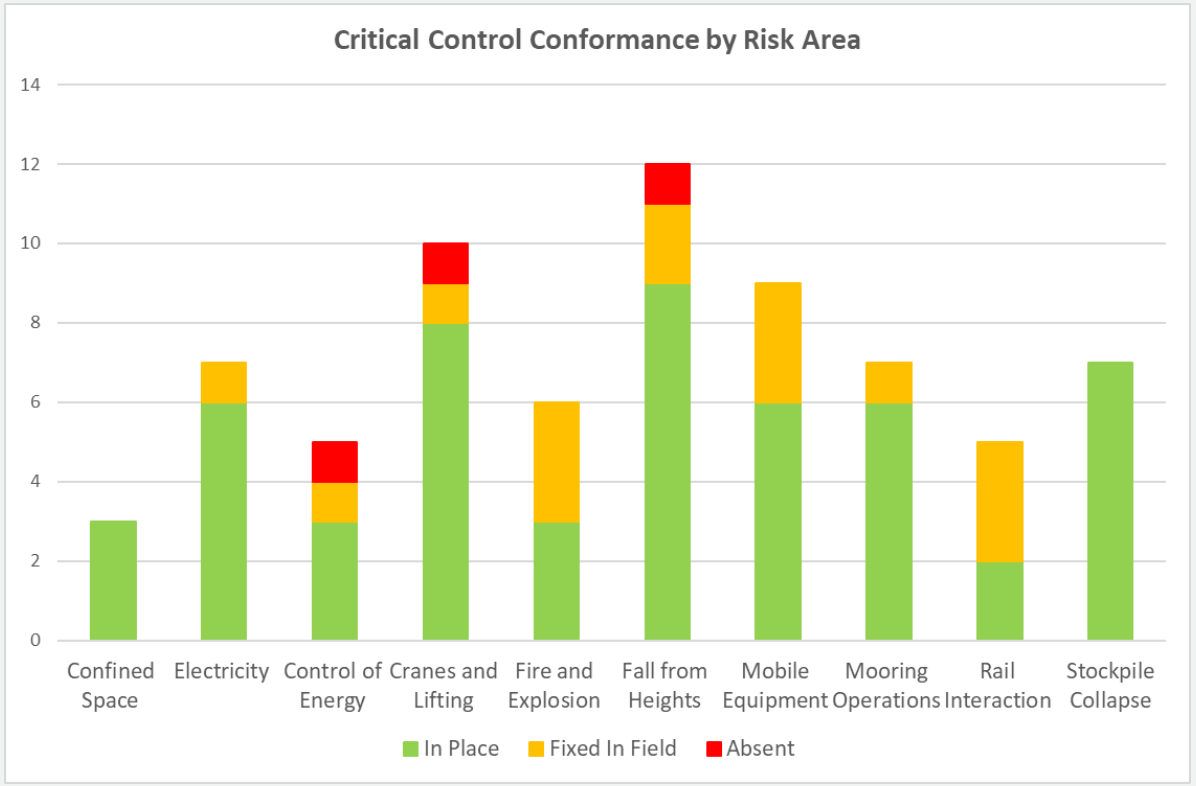
23
% CCV's Unscheduled

73%
Control Conformance

8
Actions Raised







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Poll

WHERE DO YOU FEEL YOU COULD IMPROVE CRITICAL CONTROL MANAGEMENT WITHIN YOUR ORGANISATION?

1. Data analytics
2. Workforce engagement
3. Leading indicators
4. Identifying critical controls
5. Learning from SIFp incidents
6. Other

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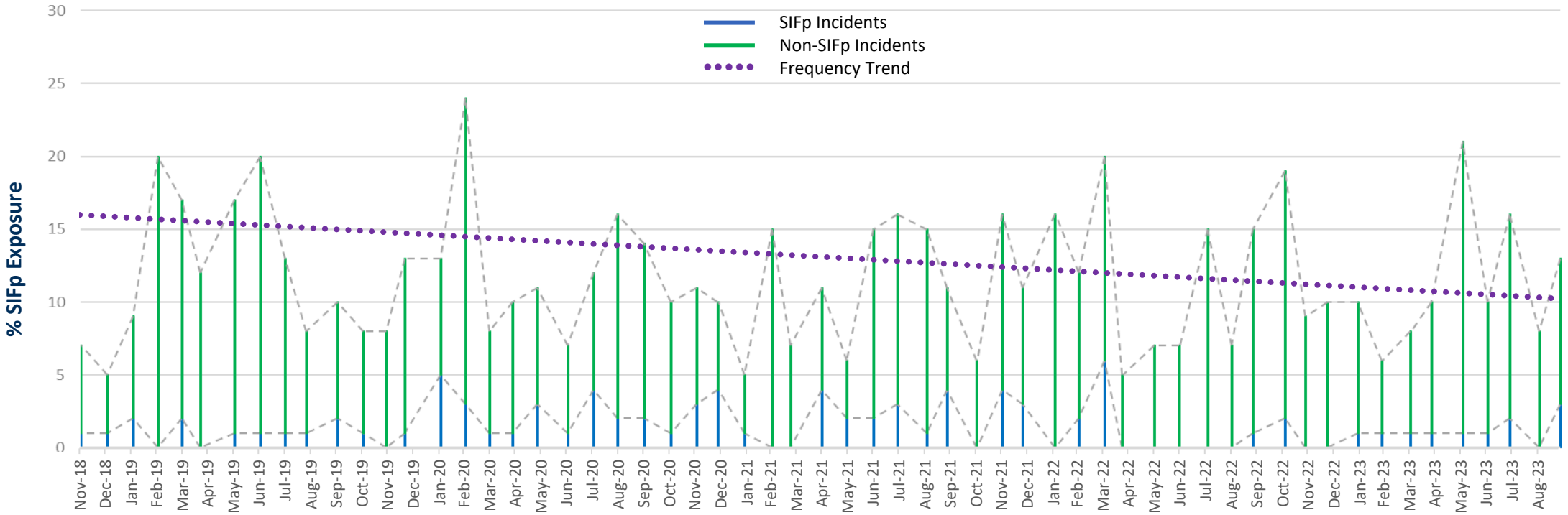
SIFp exposure 2019-2023

SIFP EXPOSURE HAS TRENDED DOWN FROM NEAR 16.3% TO 10.8% OVER 4 YEARS



Notes:

Global SIFp Exposure rate benchmark equates to ~20%*

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In 2024,

1 in **9** near miss incidents had fatality potential

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Where to next for this organisation?

- Use near miss and CCV data to improve effectiveness of controls
- Increase quality and coverage of verifications across risk areas
- Consider redesign of work or greater cross-checks within high-risk work to prevalence of human error
- Enhance engagement of risk owners
- Review risk assessment process and enhance investigation capability

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A positive approach to critical control assurance

Organisations with a positive approach to critical control assurance recognise that alignment and maturity across their business are required. These are characterised by:

1. a shared understanding of critical risk activities
2. leadership focus on SIFp (learning) and CCVs (proactive control effectiveness)
3. leverage lead and lag data to provide insights and prioritisation for exposure management
4. foster a culture of psychological safety, learning and reporting
5. increase reliability and assurance of reporting

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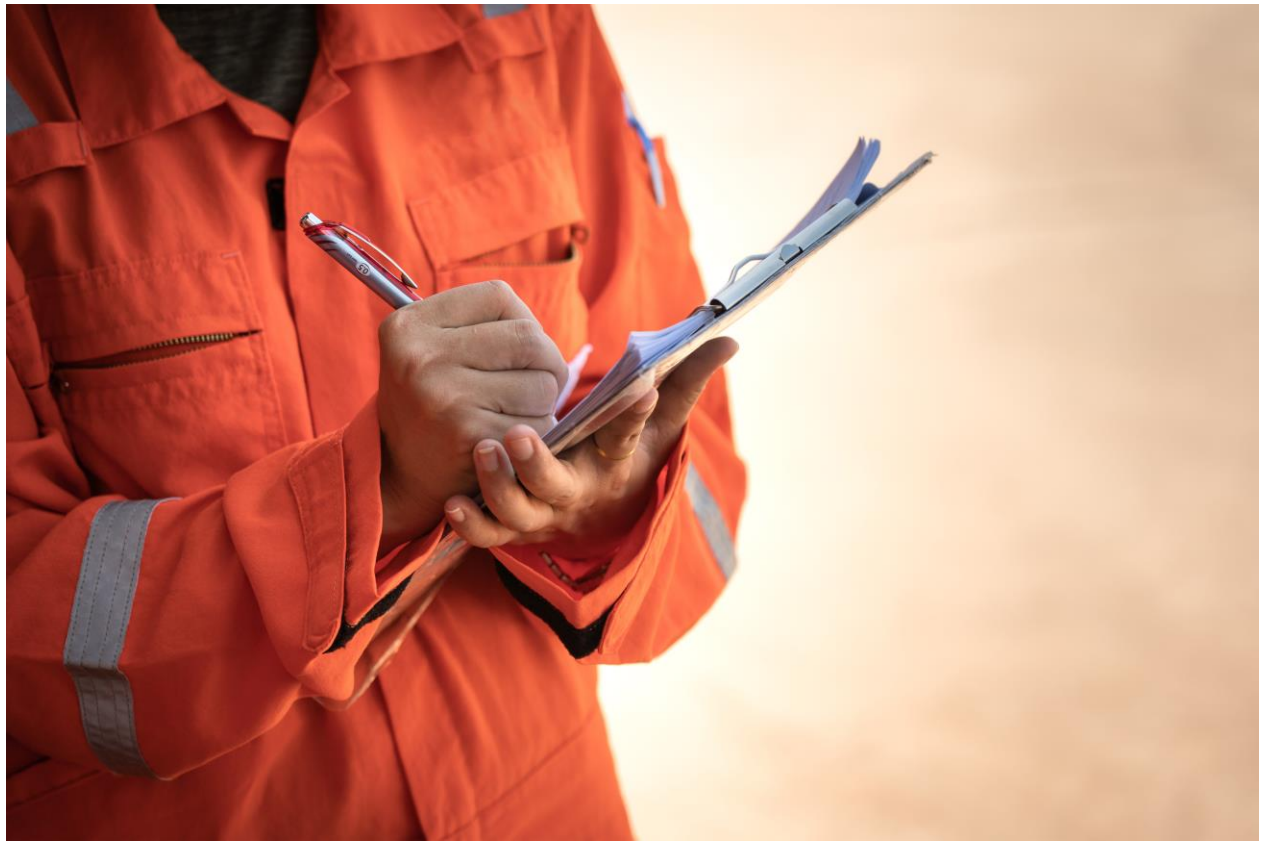
DISCOVER MORE

Critical Control Assurance



Would you like a copy of our Critical Control Assurance Whitepaper with more information?

Express your interest

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DISCOVER MORE

Meta Incident Analysis®

Would you like more information on Sentis' Meta Incident Analysis?

Express your interest

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Q&A

OVER TO YOU

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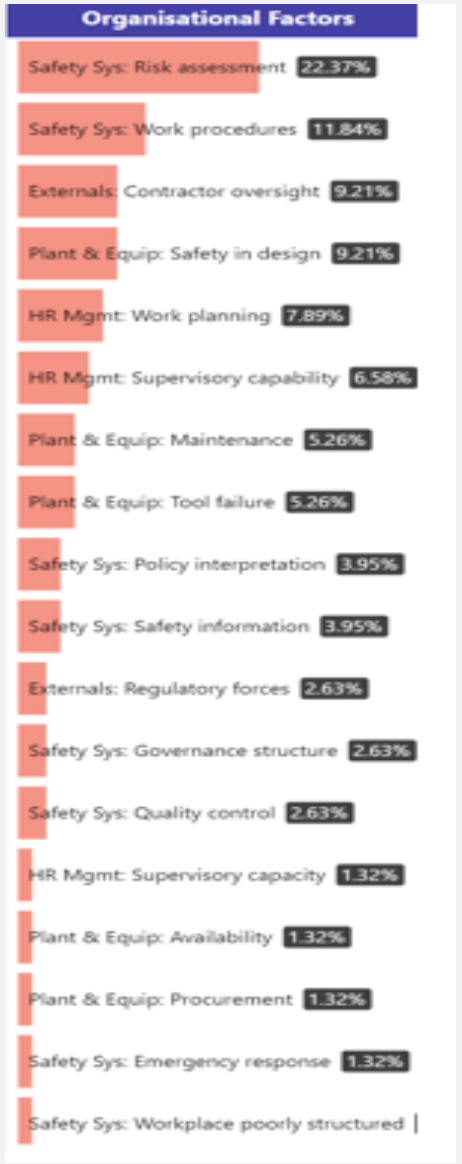
Were there any insights from the data analysis related to human error or non-compliance to engineering, maintenance or safety standards and procedures, and can you share these in the webinar.



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Comparative Findings (2020-2021 v 2022-2023)

SIFp Events

Overall SIFp frequency dropped from 2.1/mth to 1.4/mth

Control Enablement

Controls enablement improved from 50% to 77%

Intentional ‘workarounds’ dropped from 61% to 36%

Human Error factors

Continue to see workers being in autopilot and having natural slips/lapses – need to redesign work and/or enhance CCVs

Operational Factors

Individual (high) risk tolerance and need for enhanced work planning remain significant themes

Organisational Factors

Procedural integrity and risk assessment capability were the **two most significant issues** in 2020-2021 – and in 2022-2023.

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