

Material Risk Management

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Hanover
Germany



Presentation overview

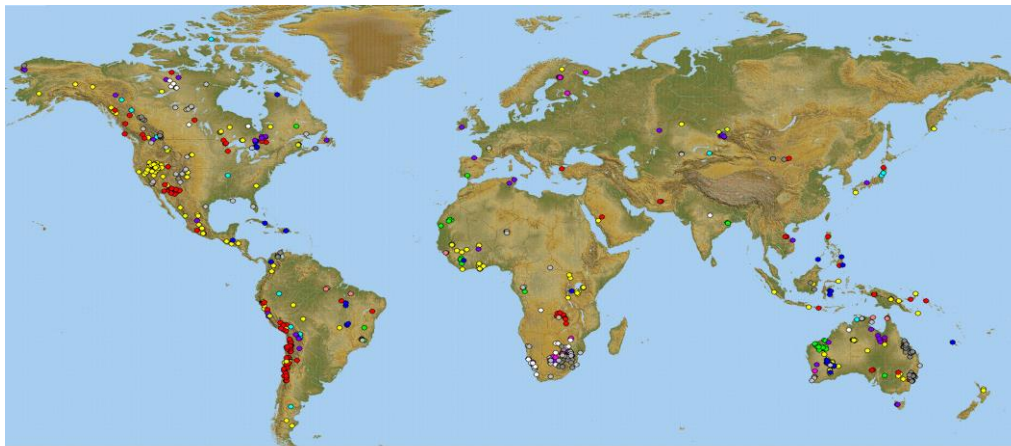
- ICMM introduction
- Mining H&S performance
- Current trends and issues
- ICMM risk management journey in response

ICMM at a glance



CEO led
23
Company
members

35
Association
members



Main metal: Au, Ag, Cu, Fe, Ni, Pb, Zn, PGMs, coal, Al, diamonds, other
Source: Raw Materials Data, Copyright: SME, Metals & Mining, Stockholm, 2014

Over 950 sites
in 58 countries

Our vision and its fundamental implication



ICMM Vision

leading mining and metals companies working together and with others to strengthen the contribution to sustainable development



Fundamental implication

creating value for shareholders while simultaneously creating value for the communities and societies in which they operate



Our role: a catalyst for improving environmental and social performance in the mining and metals industry

Occupational Health and Safety

performance

of the mining and metals industry

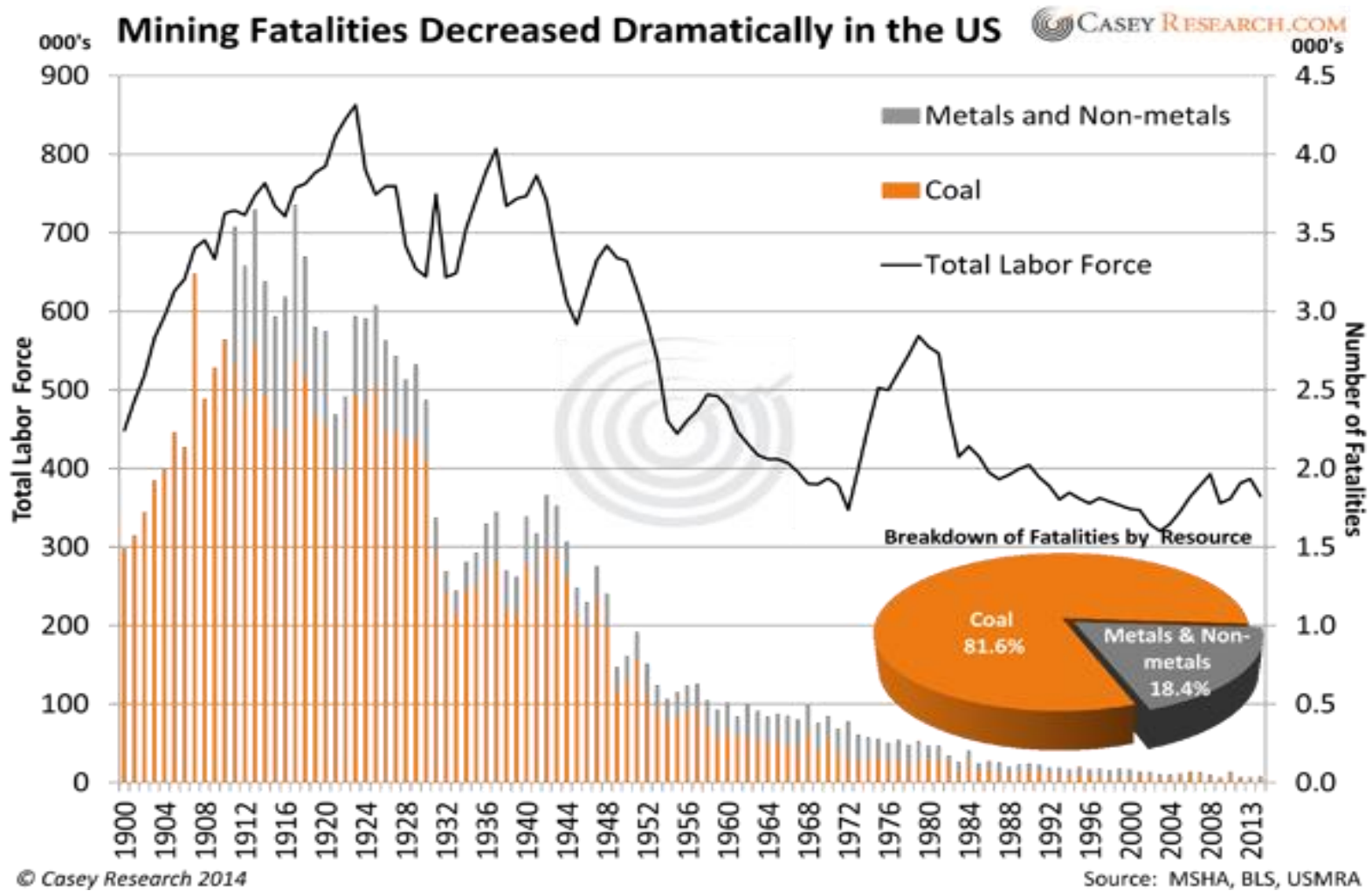
Major catastrophic events over the past 100 years

Year	Mine	Country	Deaths	Commodity
1942	Honkeiko	China	1549	coal
1946	Zeche Monopol Schacht Grimberg	Germany	405	coal
1960	Laobaidong	China	684	coal
1960	Coalbrook	SA	437	coal
1963	Mitsui	Japan	447	coal
1966	Plakalnitsa	Bulgaria	488	copper (tailing dam)
1972	Wankie	Zimbabwe	427	coal
2014	Soma	Turkey	301	coal
Total			4738	

The real catastrophic event: occupational lung diseases

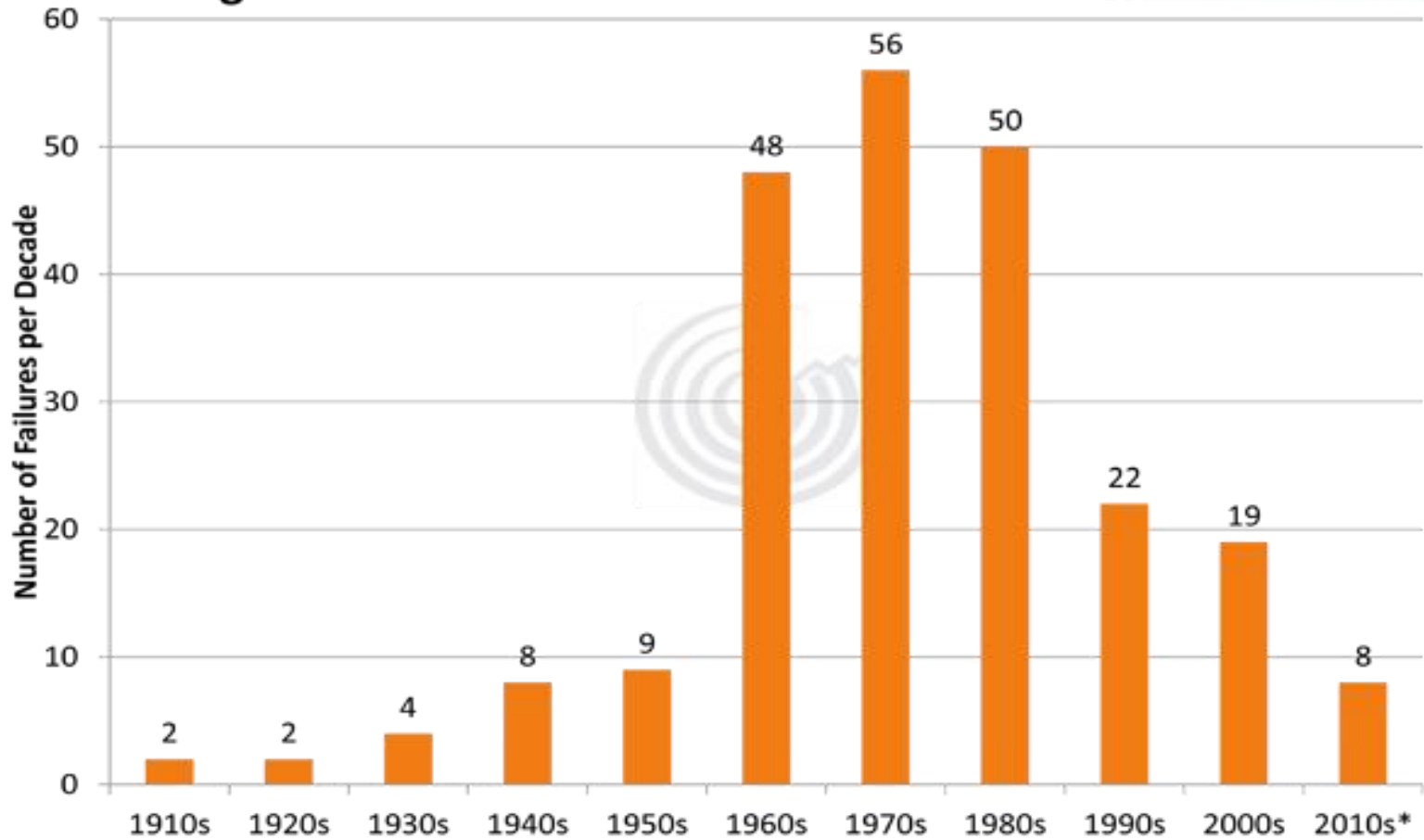
- 46 000 people died from silicosis in 2013
- 25 000 people died from Coal workers' pneumoconiosis in 2013
- How many new cases are reported per annum?
- How many people are over exposed in our workplaces today and will develop lung diseases in the future?
- How many lung cancers are caused by diesel fumes?

Are we improving?



Are we improving?

Tailings Dam Failures: 100 Years Track Record CASEY RESEARCH.COM



© Casey Research 2014

*Data from 2010 through 2014 year-to-date

Source: UNEP, ICOLD, USEPA, WISE, USCOLD, infomine.com, wise-uranium.org

Global

trends and issues

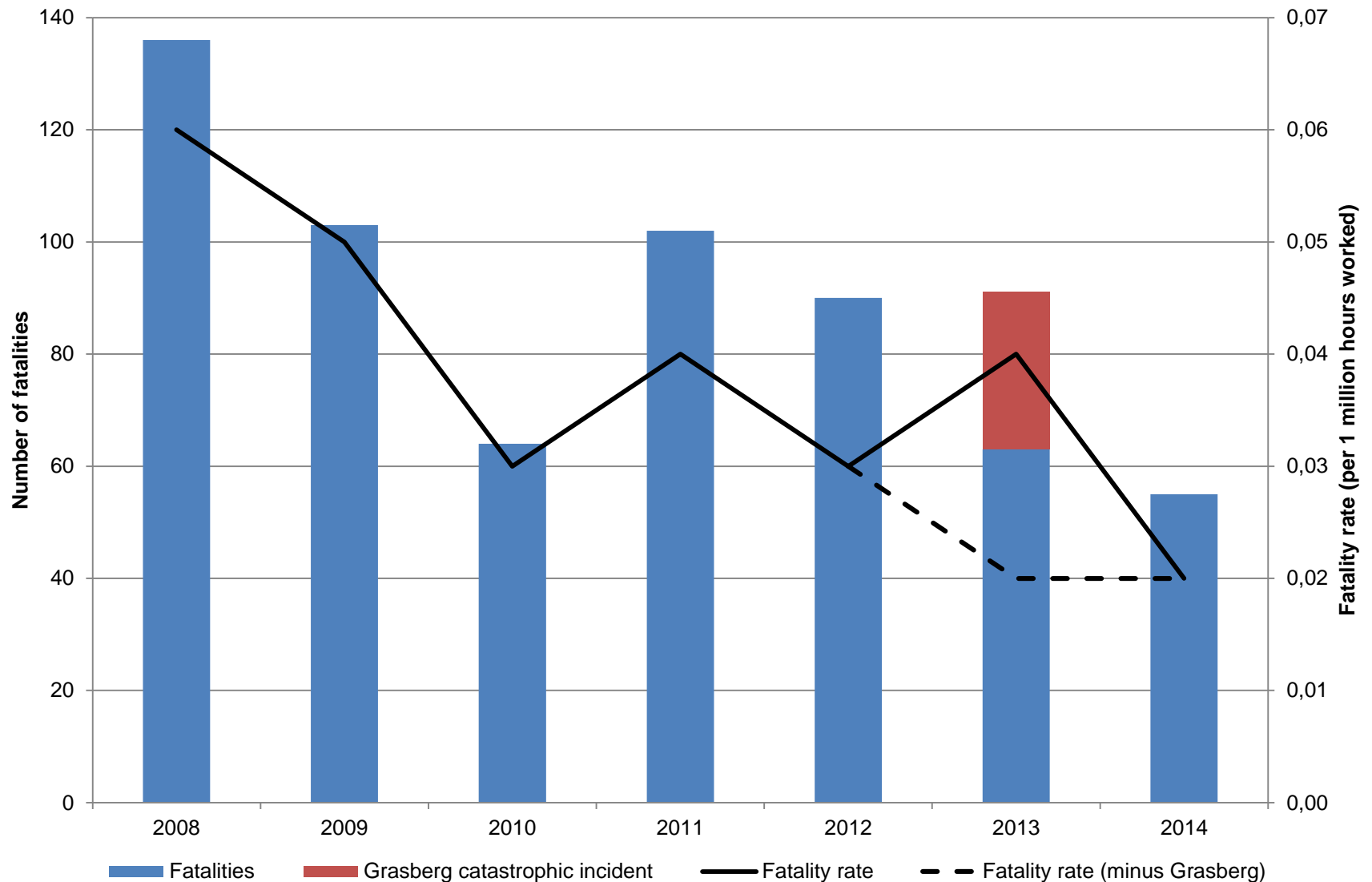
Trends

- Aging workforce (live longer, work longer)
- New hazards – nanotechnology
- Diminishing society risk tolerance
- Pressure on resilience caused by low commodity prices (value not priority)
- Better informed society (Google)

ICMM

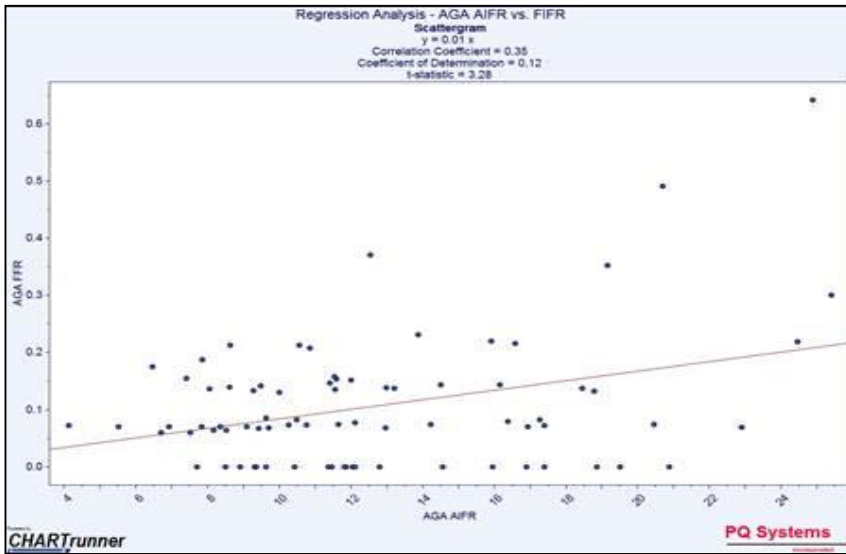
RISK MANAGEMENT JOURNEY

Fatality rate of ICMM members

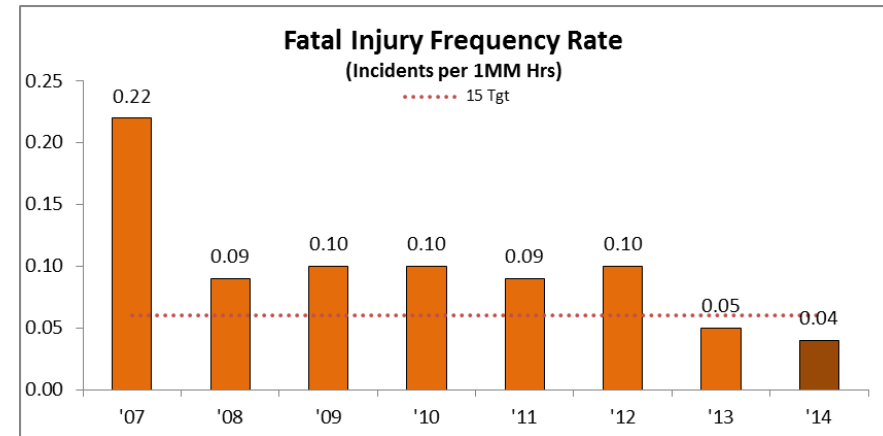
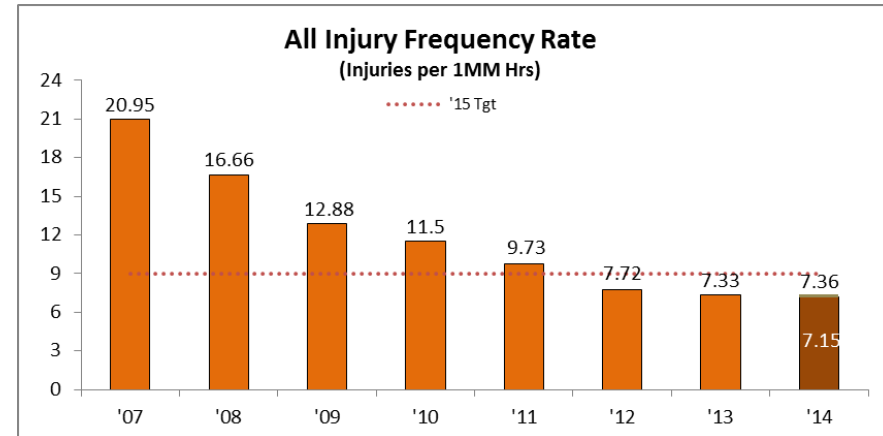


2012 - COLLECTIVE REALISATION

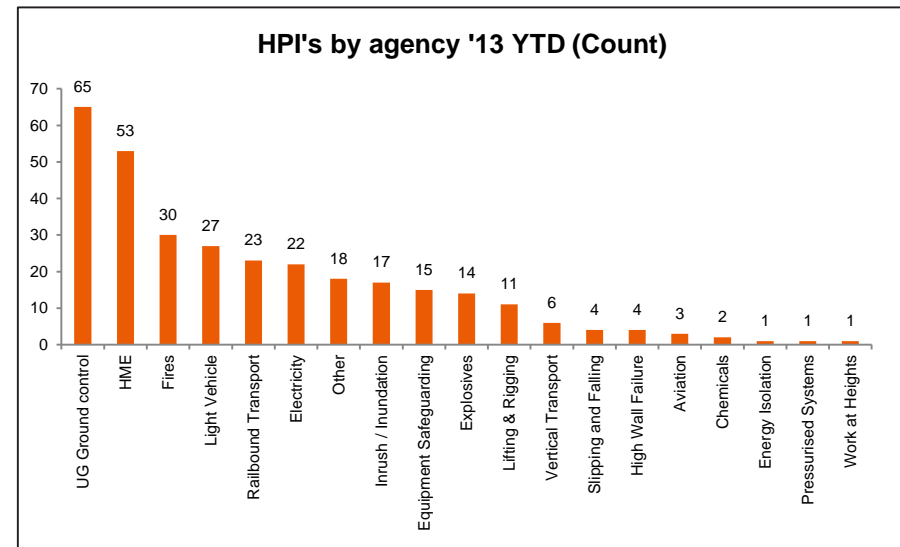
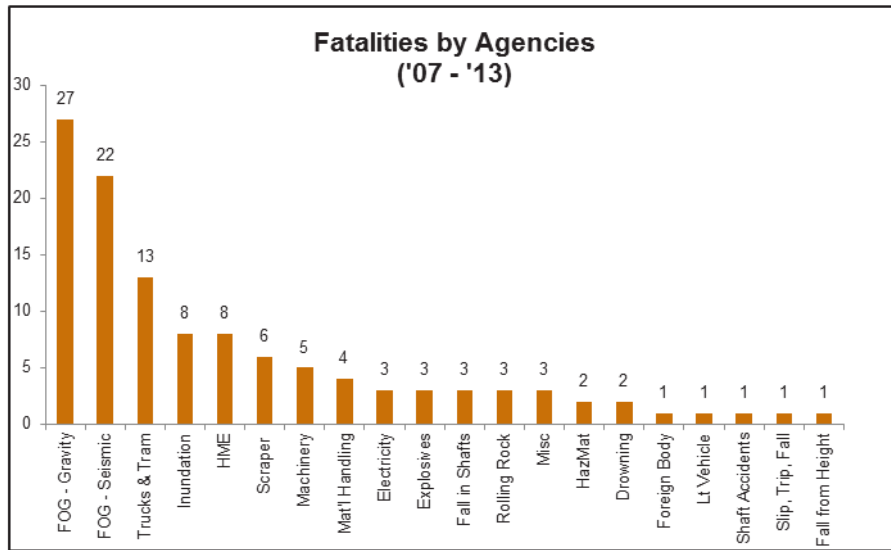
LIMITED CORRELATION BETWEEN LOST TIME AND FATAL INCIDENTS. (AGA)



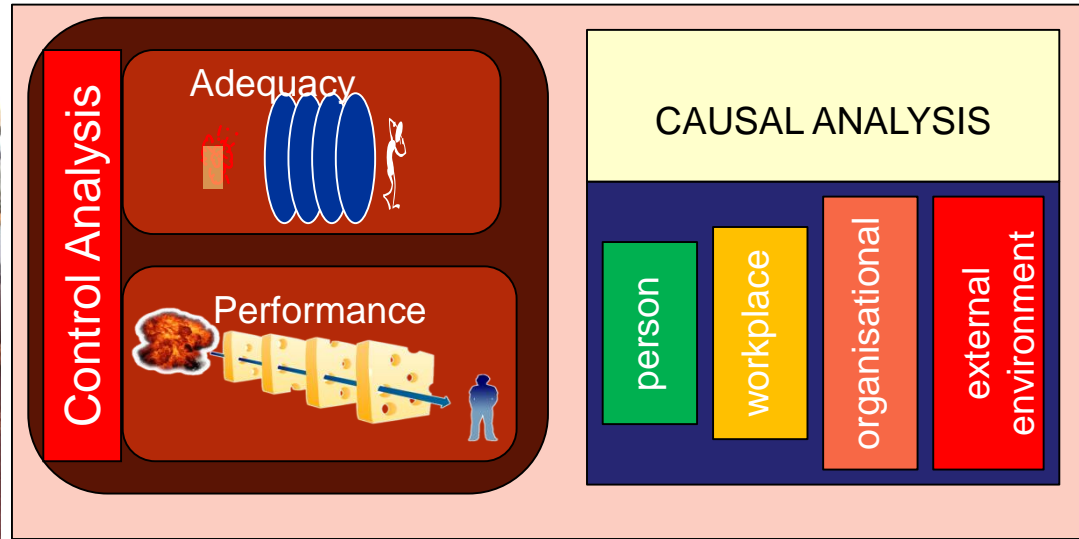
Correlation Coefficient <0.5 ...
weak to minimal correlation



2013 - Shift focus on learning from HPI given the correlation between fatal and HPI incidents



Incident investigations of HPI's highlighted control adequacy and control performance weaknesses



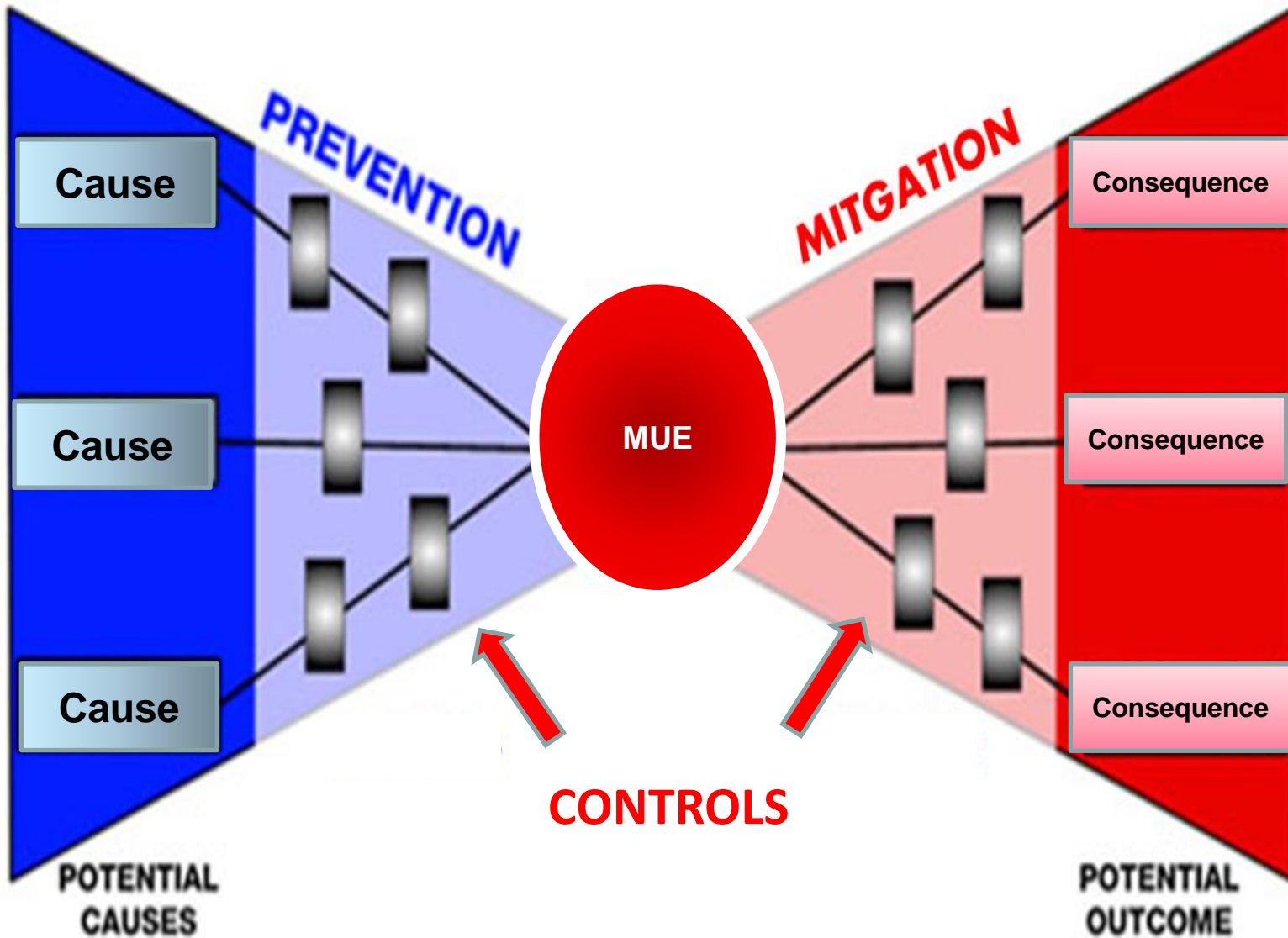
2014

Realised the value potential of CCM



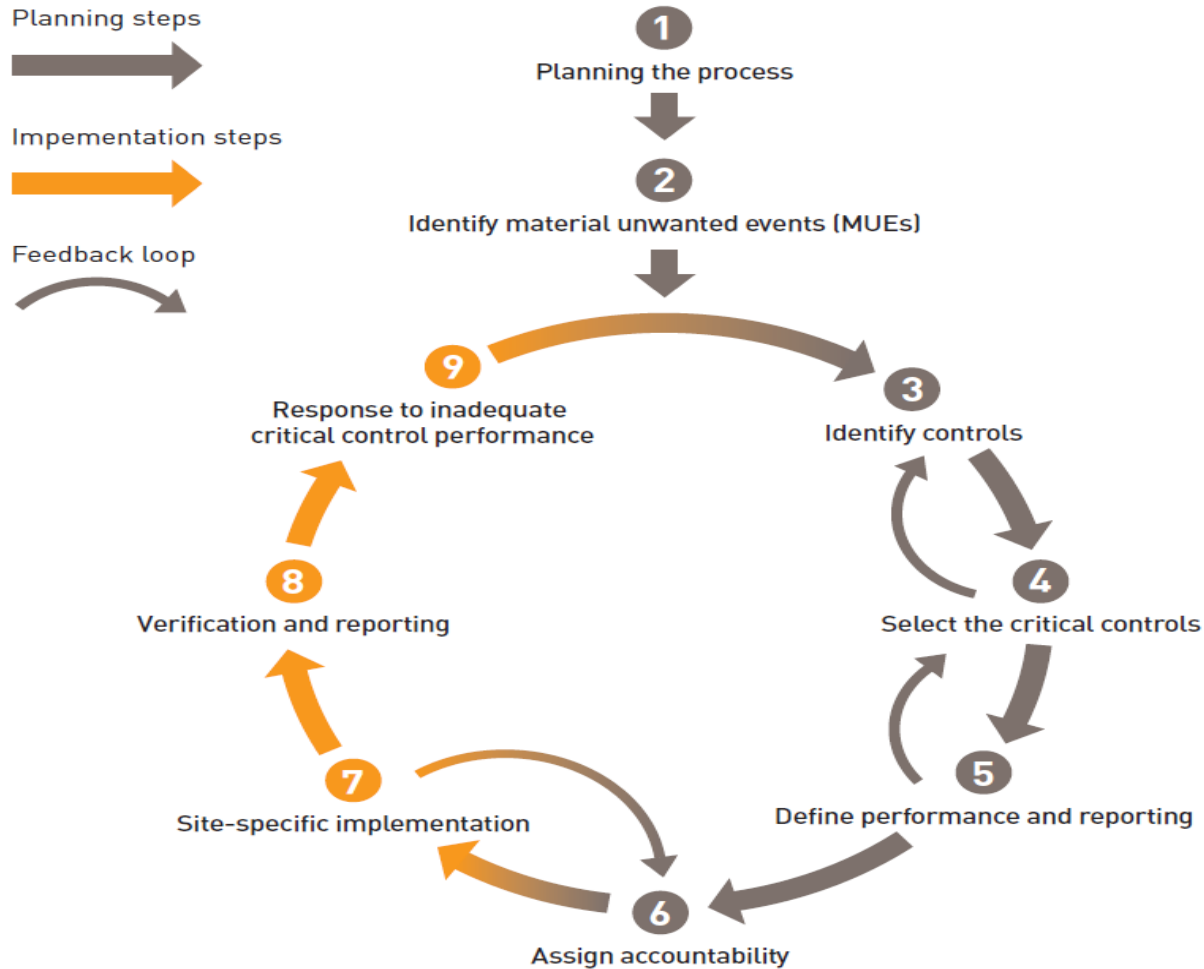
Critical control management is an integral part of risk management with a focus on the critical few risks and associated critical few controls

<http://www.icmm.com/publications/health-and-safety-critical-control-management-good-practice-guide>



**The Bowtie Analysis (BTA)
method**

CCM process overview



Risk component

What are the critical controls?

Risk & Bow-tie analysis

Critical control component

Are they working?

CCMP
(Formalised and schedule)

Are they in place?

Critical Control Verification
(Routine checking, via field checklists)

Are they known?

Procedures / Work Instructions
(Implementation of critical controls)

- **CCM is a major positive step change**
- **Management of the change is part of the 'journey'**
- **Other internal & external stakeholders should join the 'journey'**
- **Leadership and mature safety culture are fundamentals for success**

Work Process
CCM

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

CC
Management

4

Control Effectiveness
(BTA+)

1

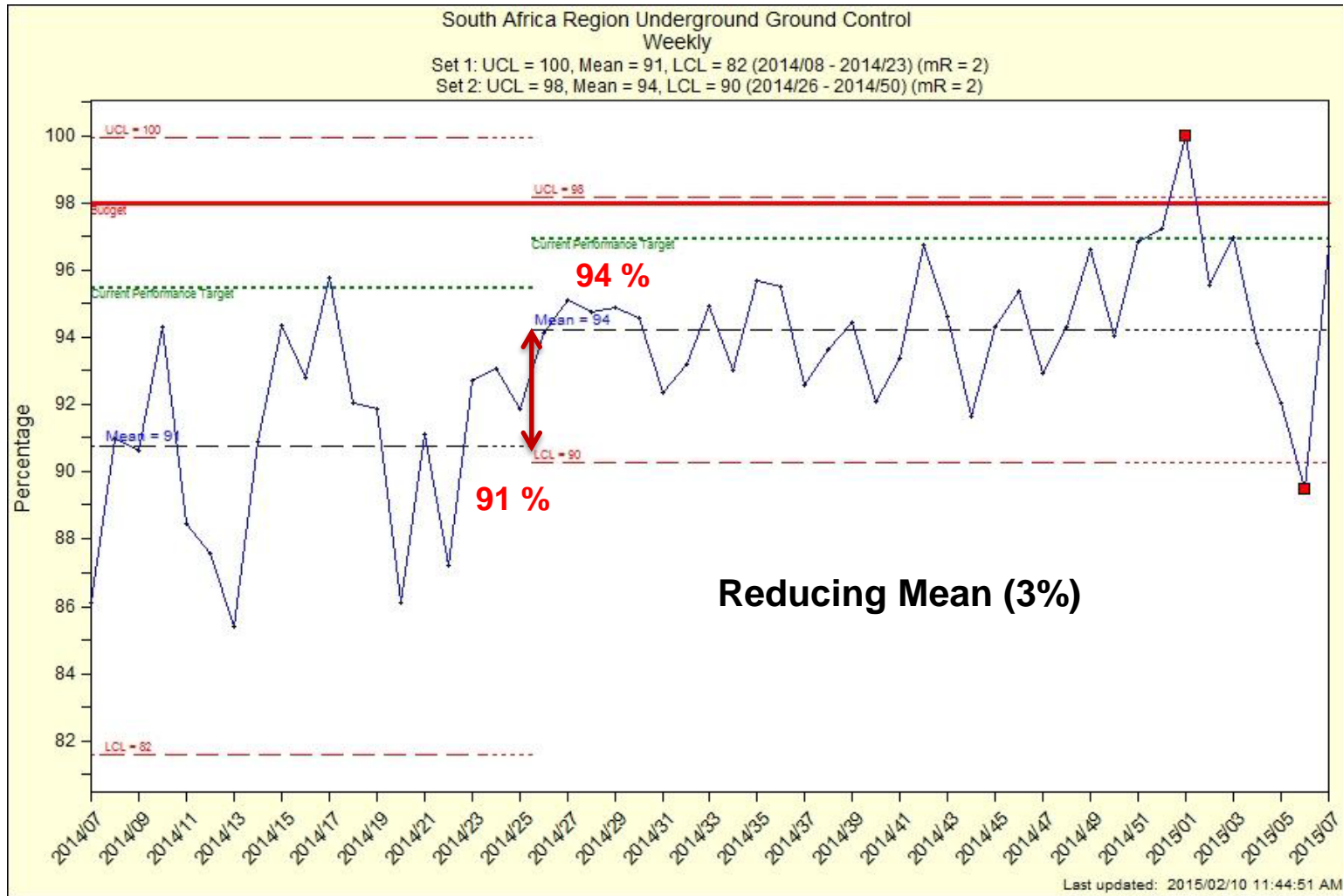
Control Focus

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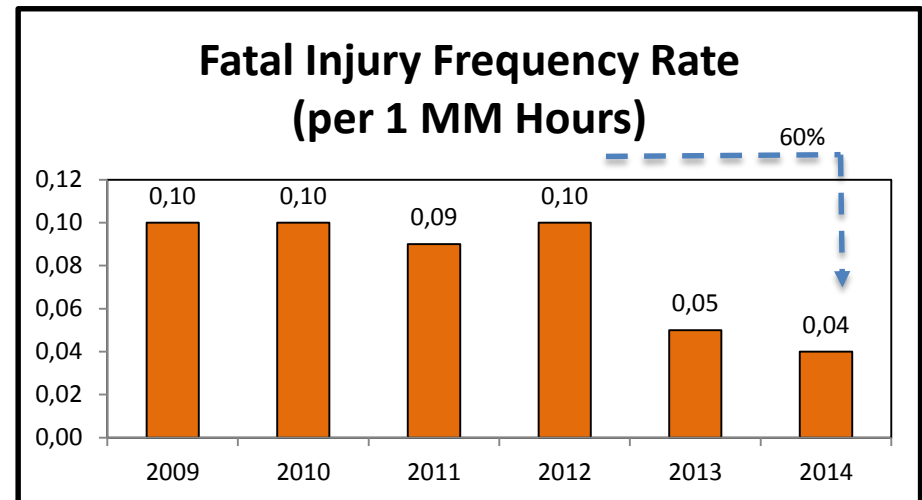
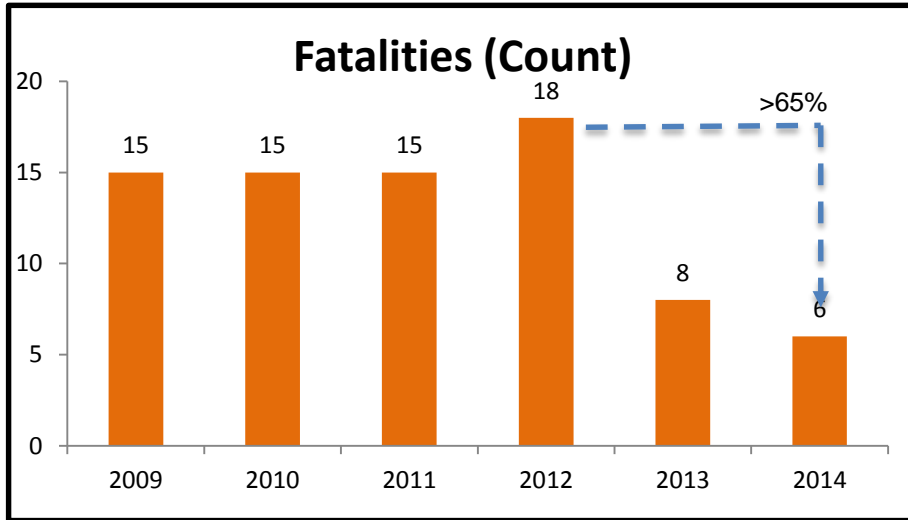
Risk Rank Focus



CCM value: Control performance variability and reliability



Case study: Reduced fatality rate within two years of implementation



For further information:

www.icmm.com

[@icmm_com](https://twitter.com/icmm_com) 

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