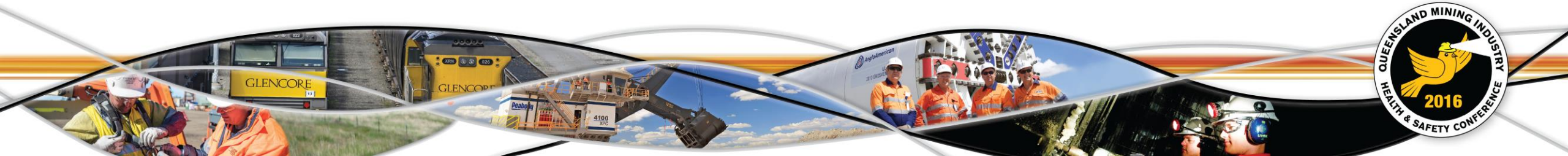
Geography, History and Zero Harm

16/08/2016

Andrew Clough



Introduction

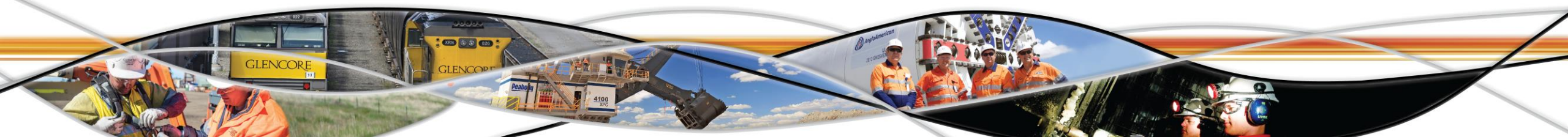
Risk Management processes have had a dramatic effect in reducing serious incidents in the mining industry.

The most popular assessment technique is the Work Place Risk and Control (WRAC) using a risk ranking matrix of likelihood and consequence to determine relative levels of risk.

The WRAC approach provides a number of benefits, including the involvement of those workers who may potentially be exposed to the hazard being assessed.

There are also limitations to the WRAC approach.

This presentation will discuss those limitations and makes recommendations on how to obtain a better result from the process.



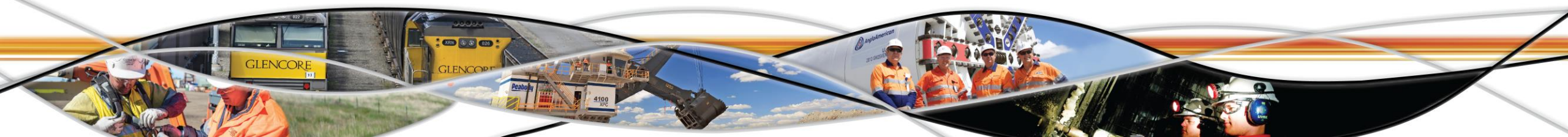
Objective of this Presentation

The objective of this presentation is to demonstrate the following points:

1. The WRAC assessment technique is not a quantitative process

2. The WRAC assessment technique is a subjective process influenced by the perceptions of the participants, the group dynamics within the assessment team and the organisational culture

3. To optimise the WRAC assessment technique the team members must be carefully selected according to their experience and values to mitigate the subjective nature of the process

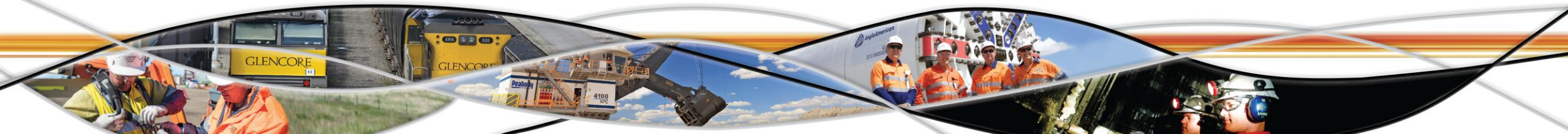


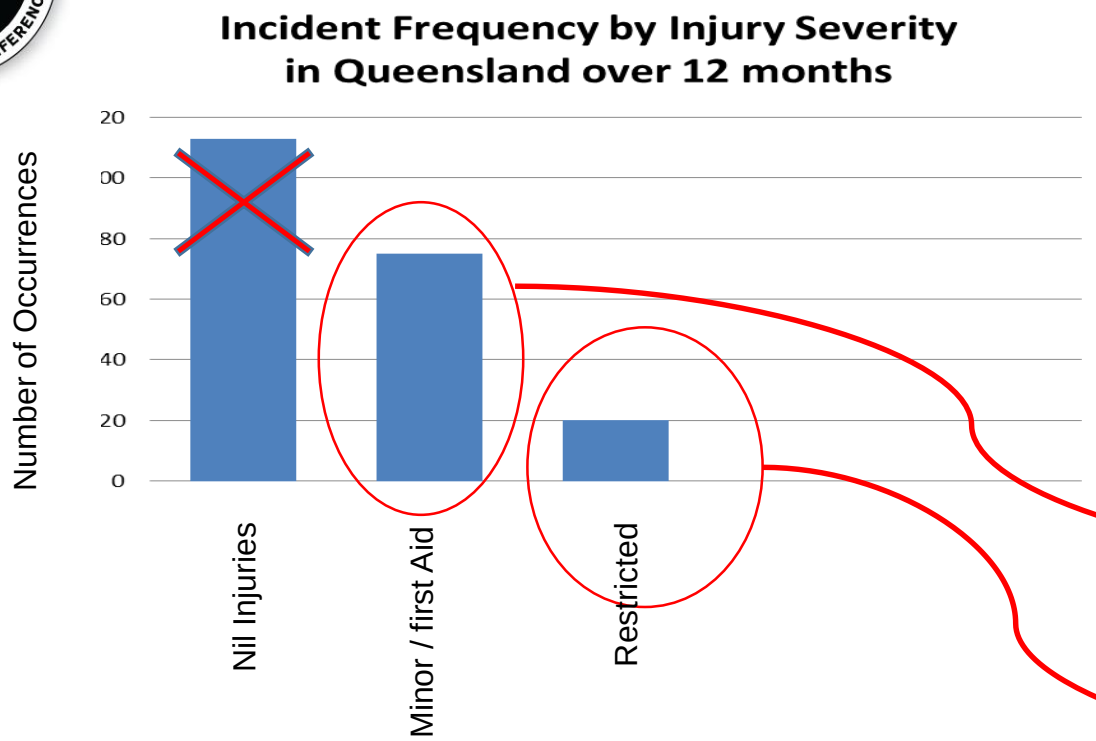
Workplace Risk Assessment and Control (WRAC)

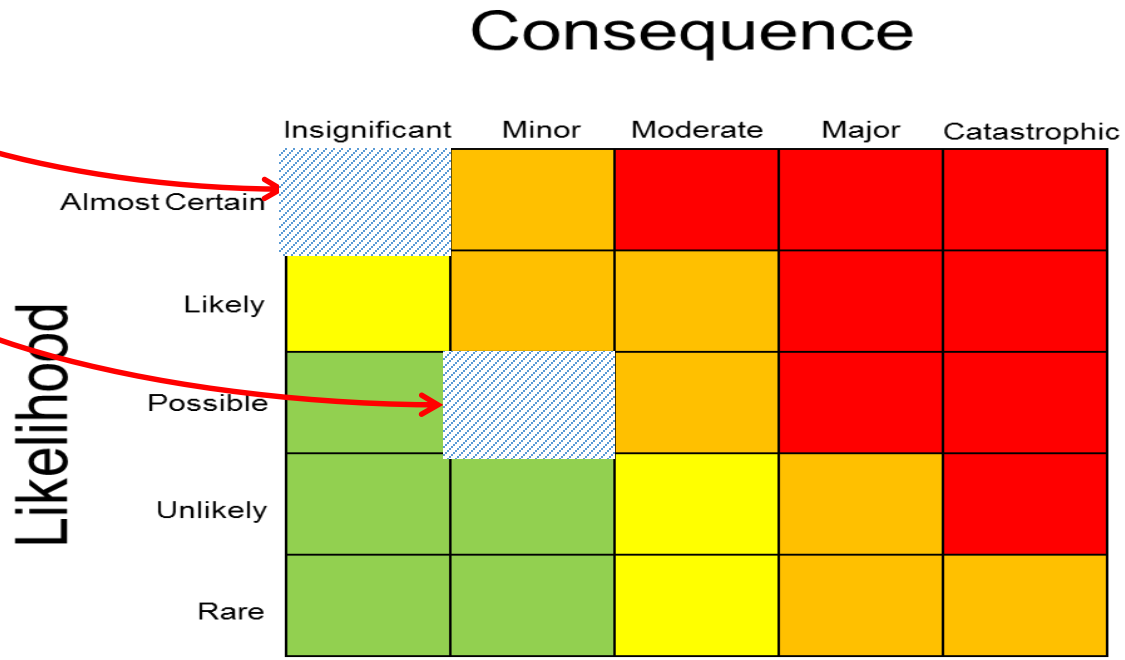
Consequence

Likelihood	Insignificant	Minor	Moderate	Major	Catastrophic
Almost Certain					
Likely					
Possible					
Unlikely					
Rare					

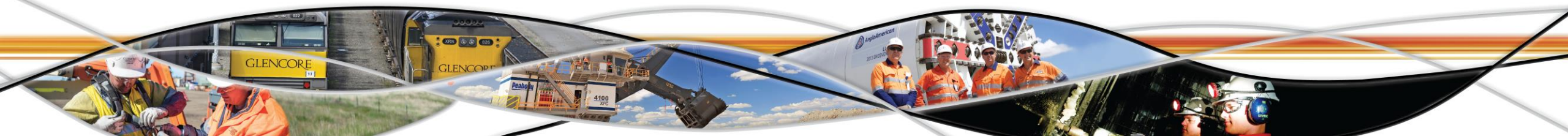
- Low Risk
- Medium Risk
- High Risk
- Extreme Risk



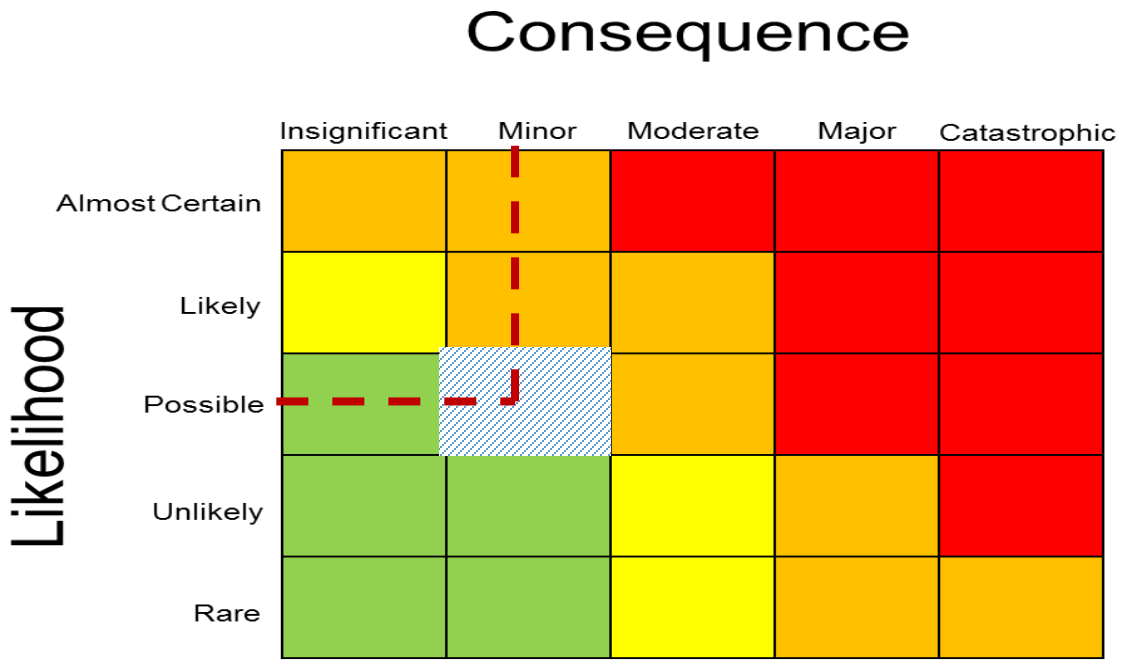




The data associated with an event with no consequence is not captured in this WRAC

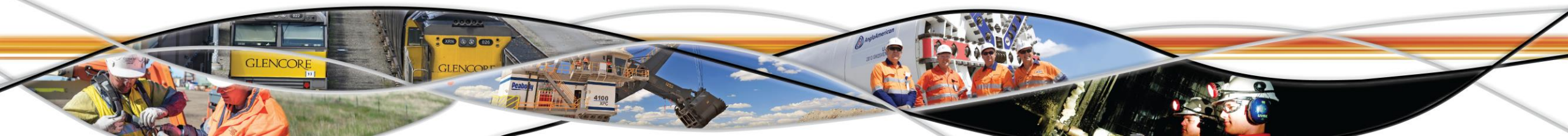


Further Reduction of Information

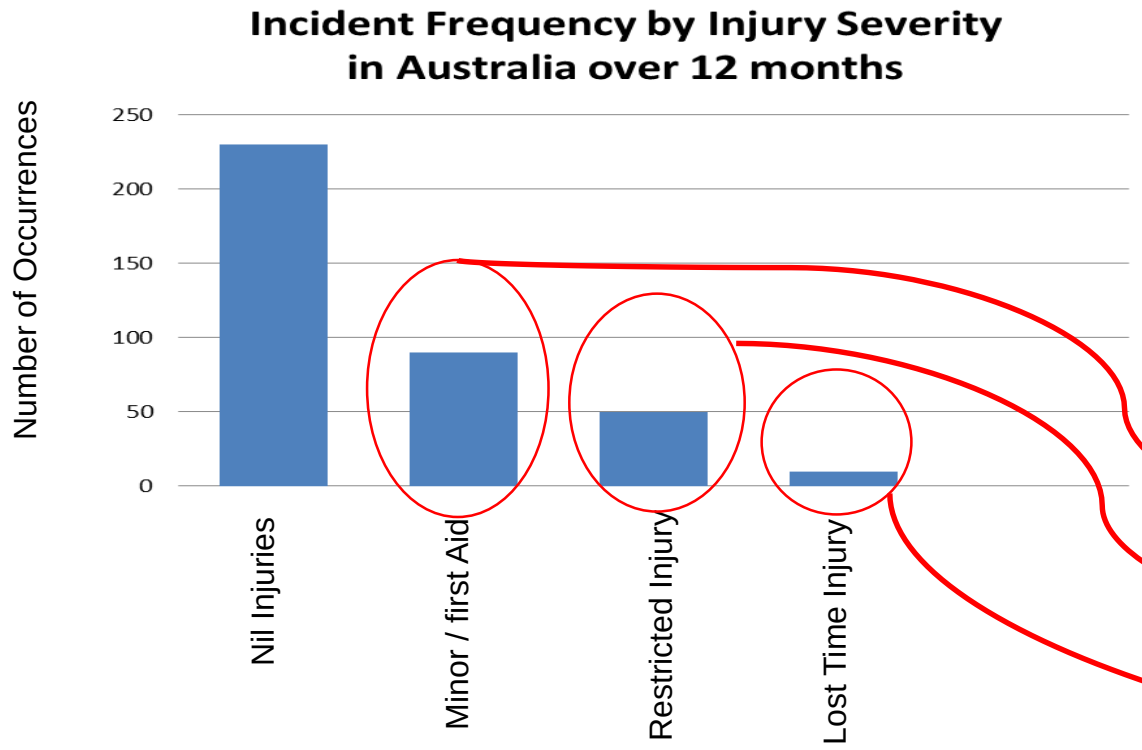


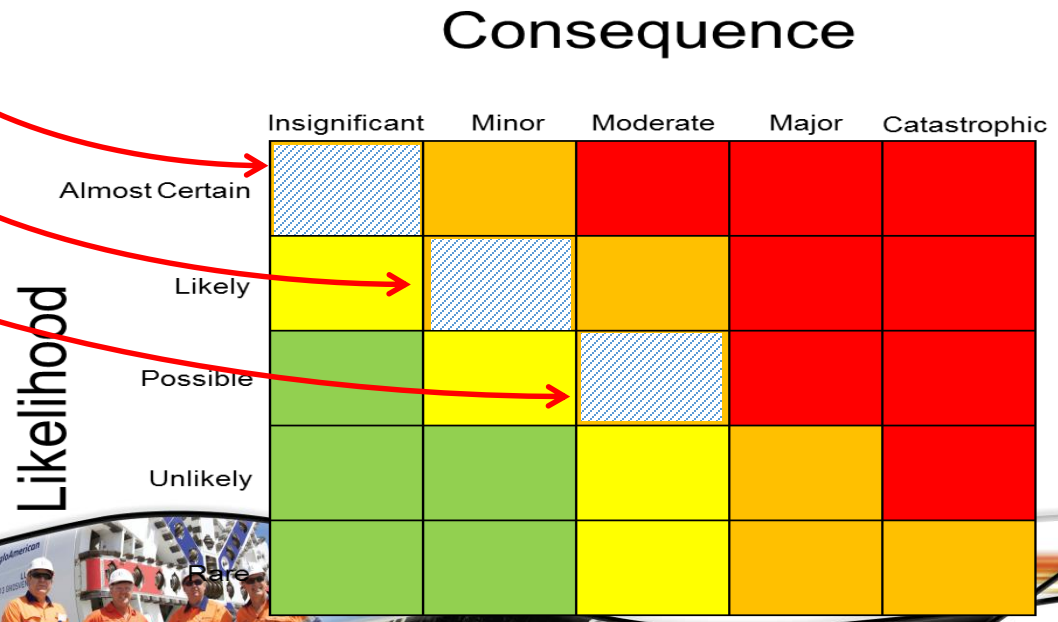
Practice is to choose the worst credible outcome

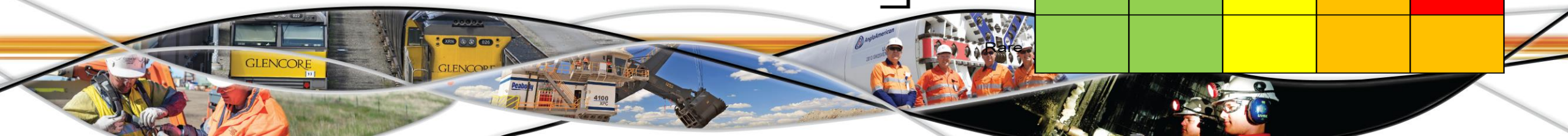
This results in the full data of the histogram being reduced to a single value
In this case a *Possible – Minor* risk rating.



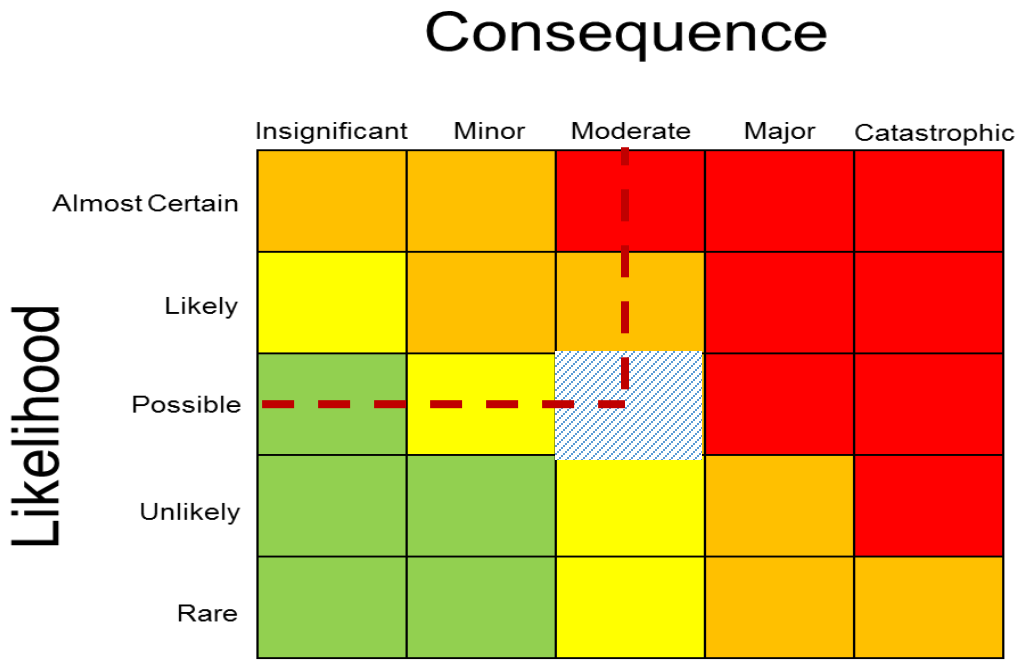
Expanding the Geography
Australia over 12 Months



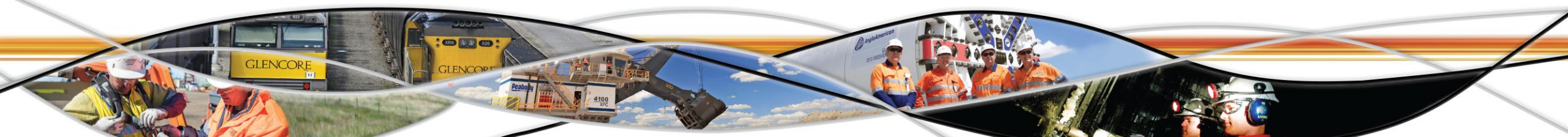




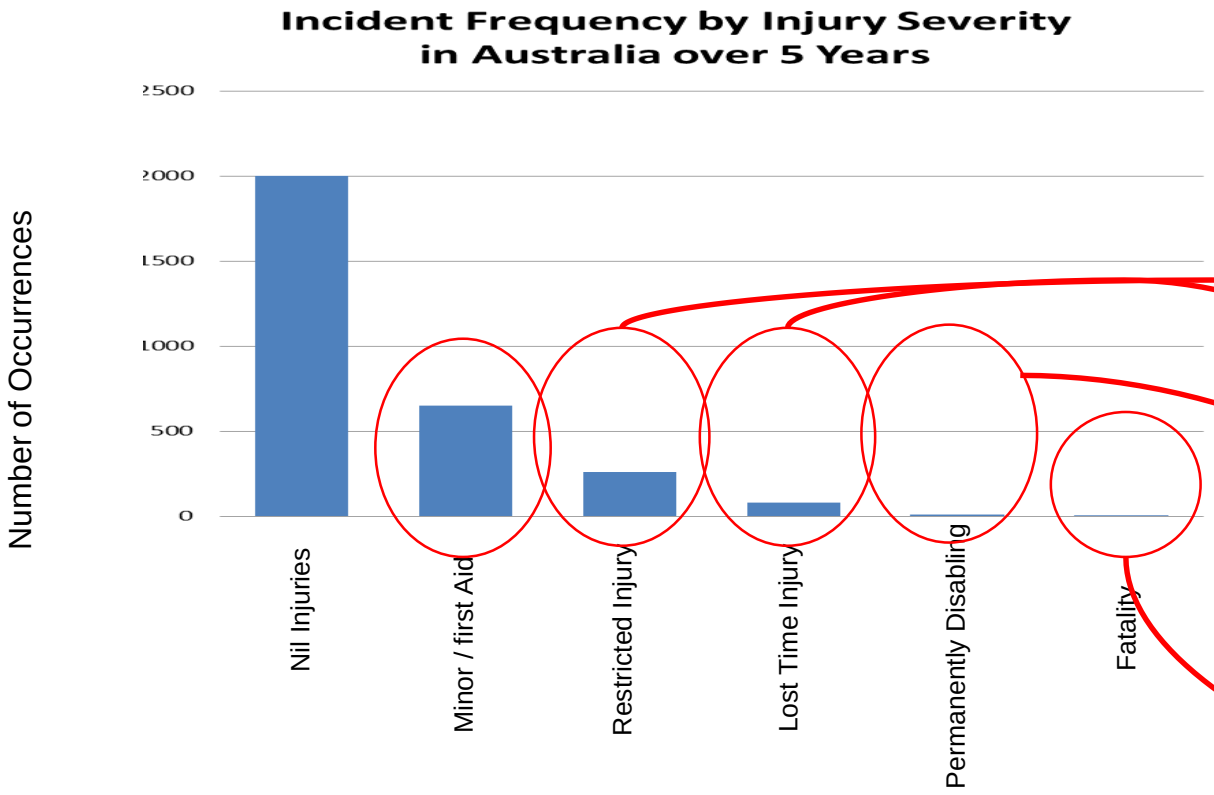
Expanding the Geography

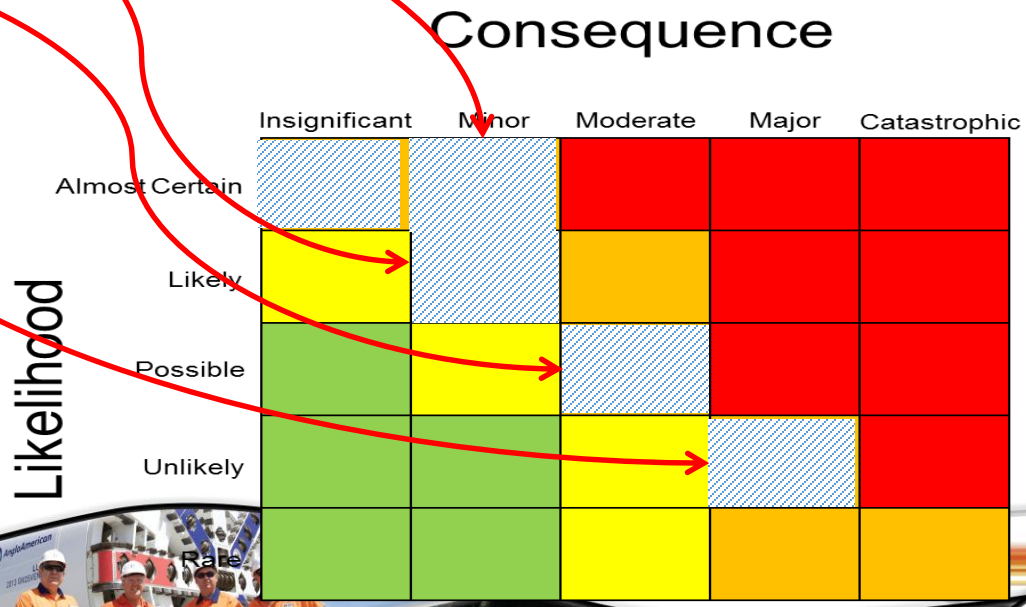


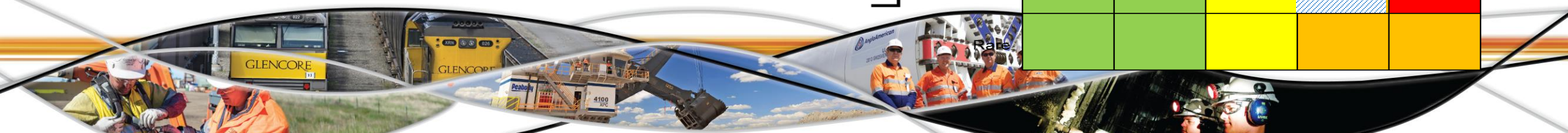
The risk rating has moved from *Possible - Minor* to *Possible – Moderate*.



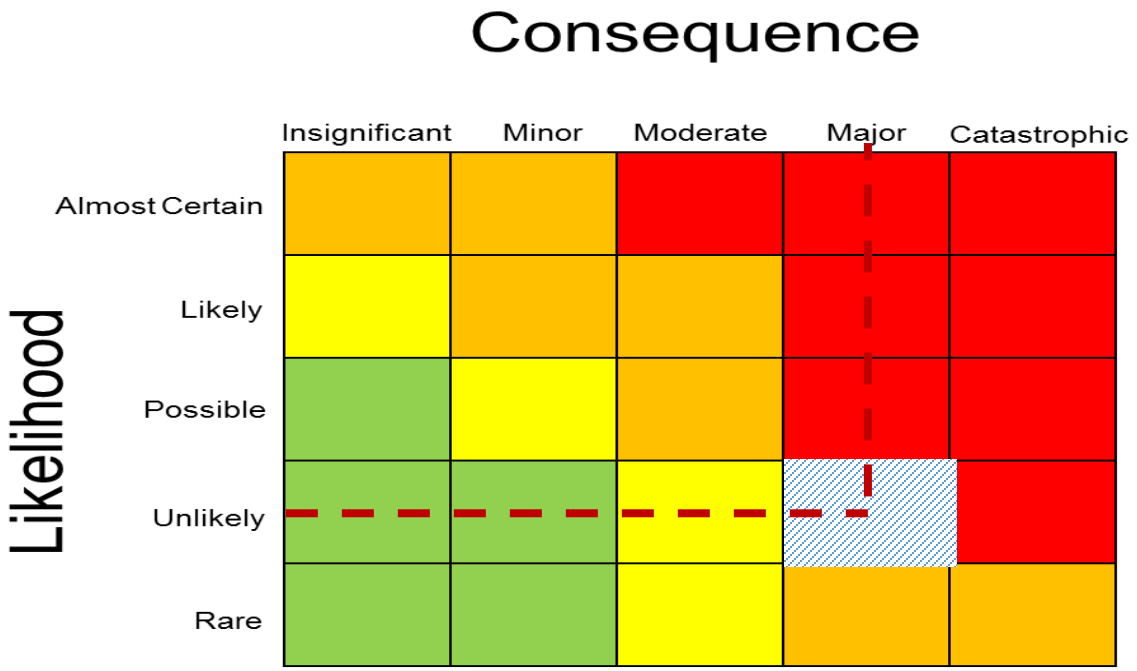
Expanding the History
Australia over 5 years



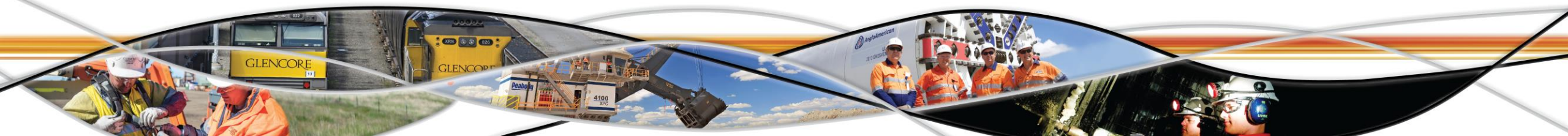




Expanding the History

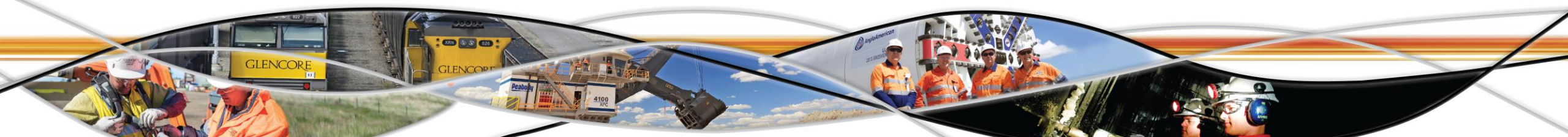


The risk rating has now moved to *Unlikely – Major.*

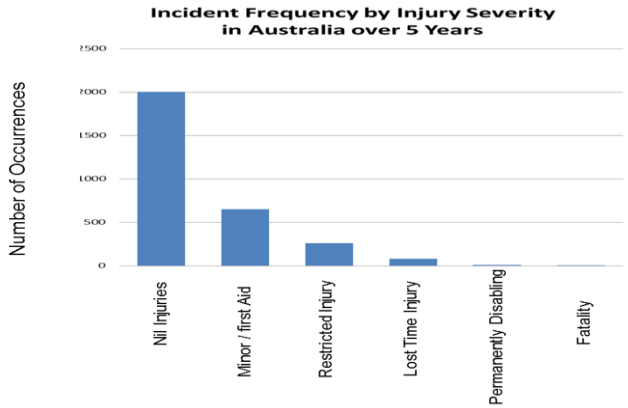


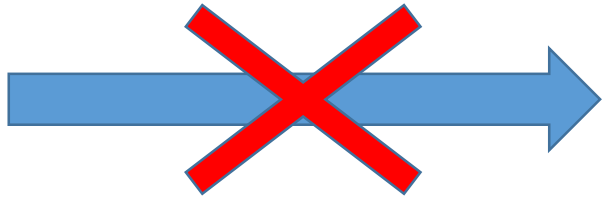
What does this all mean?

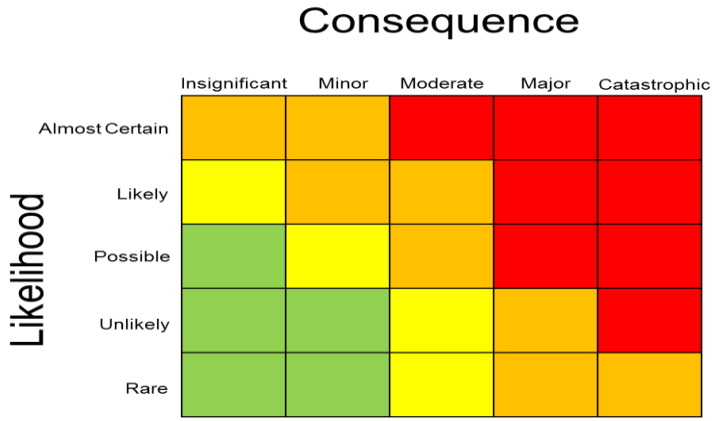
- The risk rating is influenced by the size of the data population that sits behind the assessment.
- The data population is determined by the *geographical* area from where the data is drawn and the length of time or *history* over which it is drawn.
- The larger the geographical spread of the data and the longer the history should result in a more accurate assessment of consequence and likelihood.
- In practical terms this translates to ensuring that the participants in the WRAC assessment process have the relevant experience in terms of the variety of exposure they have had (Geography) and their time in the industry (History).



However ……

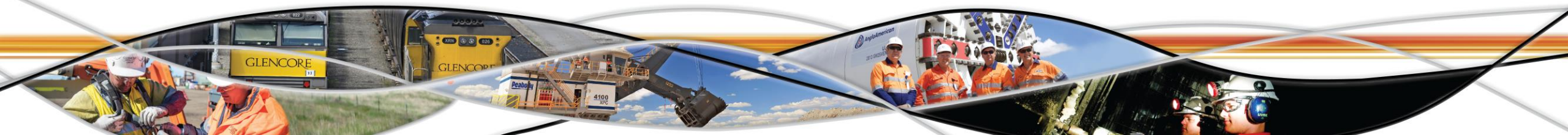






- The WRAC assessment technique oversimplifies the presentation of likelihood versus consequence
- The WRAC assessment technique generally does not account for events with zero consequence which may be a substantial part of real world data.
- **Most importantly** real world data is either **not available** or is **not used** when making an assessment using the WRAC technique

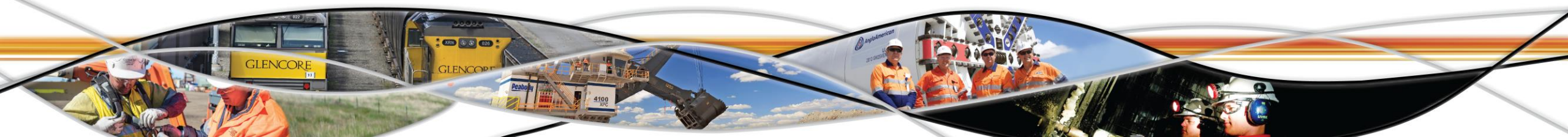
The WRAC assessment technique does not result in a quantitative result and is generally not based on real data



1. The WRAC is not a Quantitative Process

The WRAC rating is not based on real world data but the cumulative perceptions of the individual participants in the process.

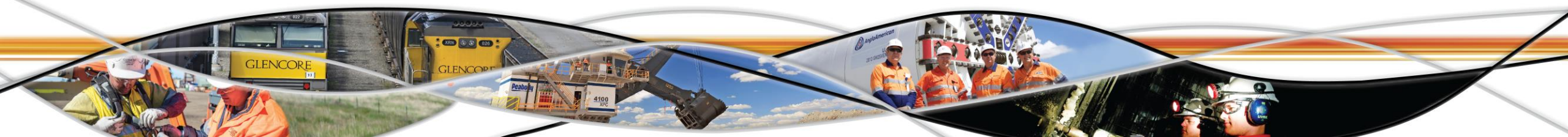
If we are to get the best result from the WRAC process we need to account for the factors that affect the perception of risk.



2. Factors affecting the perception of Risk

This presentation will discuss these factors on three levels:

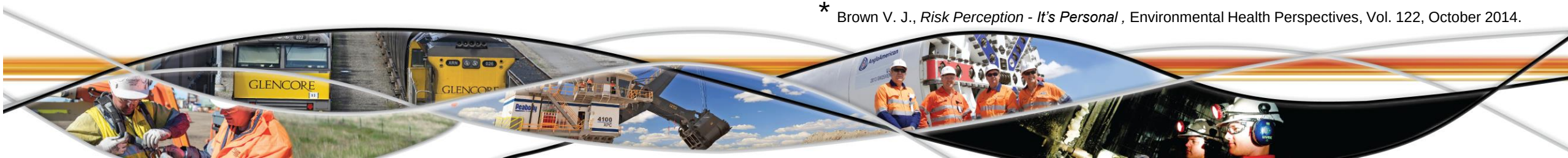
1. The individuals perception of risk
2. The group dynamics in the risk assessment process
3. The environment or context set by the organisation



The Individuals Perception of Risk

*Risk perception is a highly personal process of decision making, based on an individual's frame of reference developed over a lifetime, among many other factors.**

* Brown V. J., *Risk Perception - It's Personal* , Environmental Health Perspectives, Vol. 122, October 2014.



*10 Factors that affect an individuals perception of risk

1. Catastrophic
We tend to be more afraid of things that can kill a lot of us, suddenly and violently and all in one place such as a plane crash even though the likelihood may be quite low.

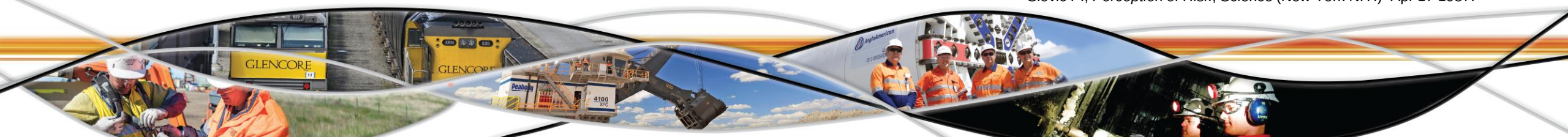
2. Control
We all have a need for a sense of control and often perceive that we have more control that we actually have. This 'control illusion' leads us to perceive risks as being less than they actually are.

3. Nature vs. man-made
Sometimes natural disasters seem less risky than human-created ones. For example, we are less afraid of radiation from the sun than we are of radiation from a nuclear power plant.

4. Choice
If I have choice between two equally risky items, then I may well perceive that the risk is lower than it actually is, probably from the sense of control that having a choice gives me.

5. Children
We are programmed to care for children and so risks that affect them may well seem greater than those that affect adults. We thus worry about children's safety and put extraordinary effort into ensuring their environment is relatively risk-free.

* Slovic P., *Perception of Risk*, Science (New York N.Y.) Apr 17 1987.



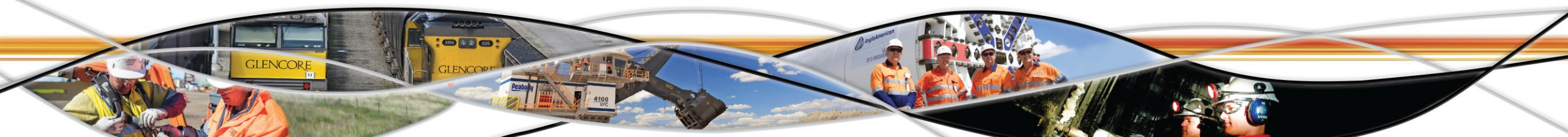
6. Novelty
Risks that we have not encountered before cause us to spend more time thinking about them and may well seem more risky. This may be because, as a safety factor, we often up the risk assessment of unknown risks. The reverse is also true in that we may underestimate a new risk due to not understanding the consequences.

7. Publicity
If a risk has a lot of public attention, such as terrorist events, then the risk is likely to be assessed as being more significant than it actually is.

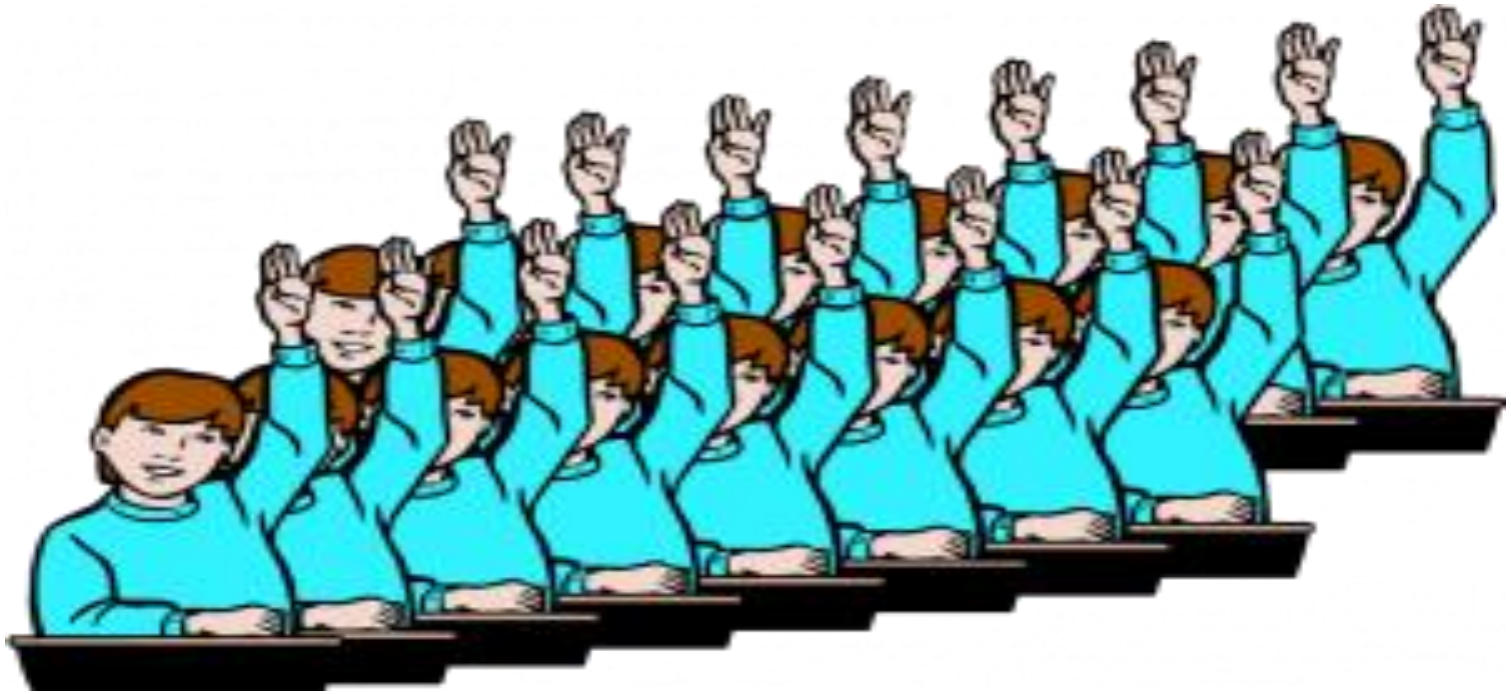
8. Does it affect me?
If I am the subject of risk, then I am likely to assess the risk as being higher than if I am a bystander. It is thus more difficult to make a decision to undergo a surgical procedure if you are the person affected.

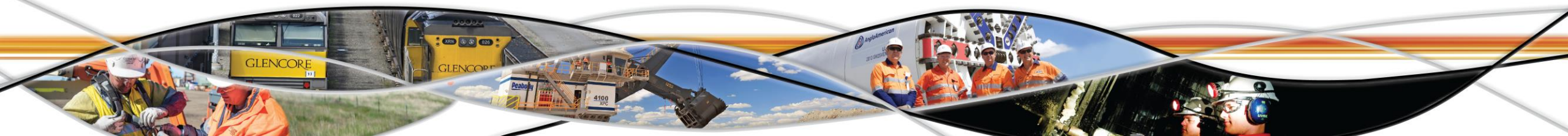
9. Risk-benefit trade-off
If there are opportunities as well as risks mixed up together and a choice could lead to benefits, this can make the actual risk being seen as being less than it actually still is.

10. Trust
Where the risk involved the actions of others, how we assess the risk will be significantly affected by the extent to which we trust the other party or parties involved.



Group Dynamics in the Risk Assessment Process



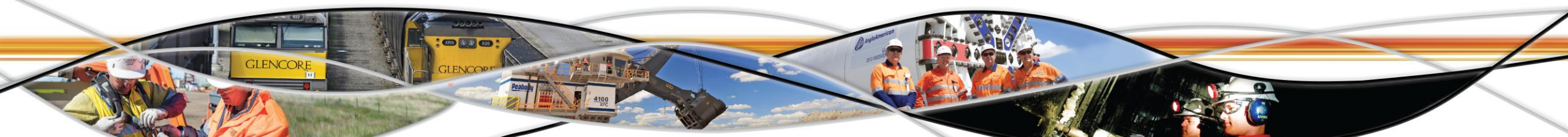


Group Think

Groupthink, a term coined by social psychologist Irving Janis*, occurs when a group makes faulty decisions because group pressures lead to a deterioration of “mental efficiency, reality testing, and moral judgment”

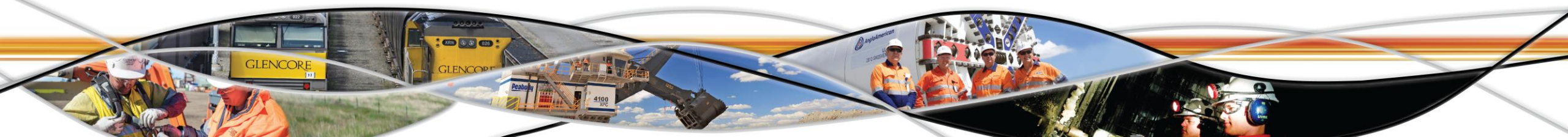
A group is especially vulnerable to groupthink when its members are similar in background, when the group is insulated from outside opinions, and when there are no clear rules for decision making.

*Janis I.L., *Victims of Groupthink- A psychological study of foreign policy decisions and fiascoes,* Boston: Houghton Mifflin Company, 1972..

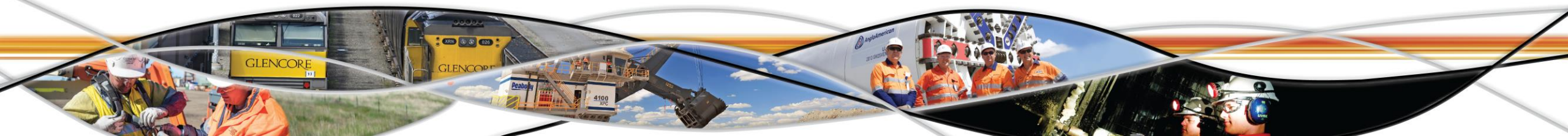


Factors that contribute towards group think

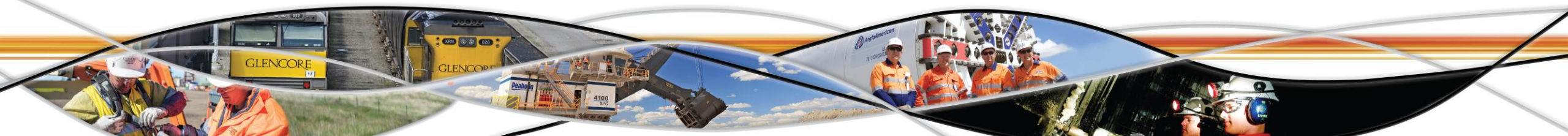
- Seeking group harmony or avoiding conflict
- A lack of diversity in the group
- Insulation from outside ideas
- A strong dominating character that pressures dissenters



A Past forgotten is a Future repeated

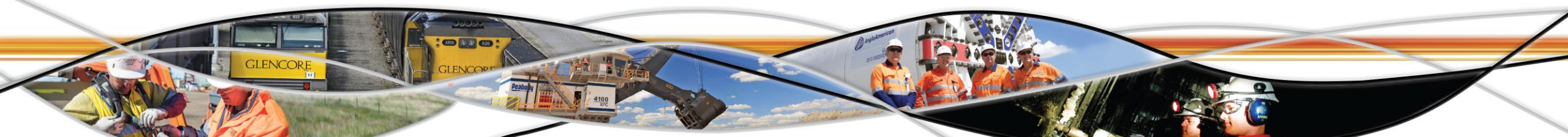


Organisational Environment



The Environment Set by the Organisation

- Inadequate risk management systems
- Poor clarity on the objective of the risk assessment
- Risk assessment becoming a platform for Industrial relations issues
- Carrying out a risk Assessment to justify a decision that has already been made
- Cost benefit Analysis to reduce Safety barriers
- Not ensuring that the controls identified have been implemented

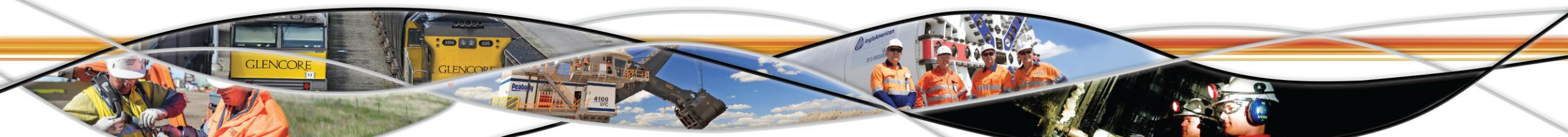


A Final Note – Zero Harm

Where does Zero harm Plot on the WRAC?

It Doesn't

Within the Queensland Mining Safety Legislation *As Low as Reasonably Achievable* is the goal of the risk management process



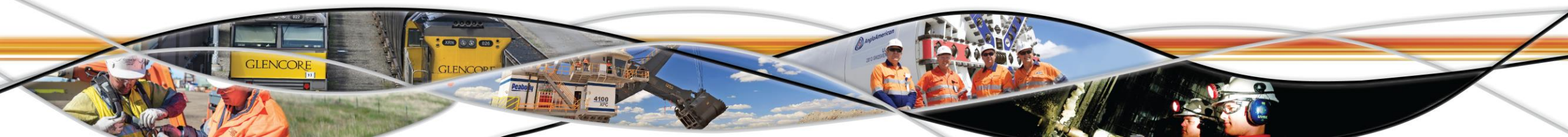
Zero Harm = Continuous Improvement

Zero Harm is a statement that we will never accept accidents as inevitable

Zero Harm is a statement that we can always improve our safety performance

Zero Harm is a statement of the only morally acceptable attitude around safety

Zero Harm is a statement that reflects the environment that the organisation seeks to create.



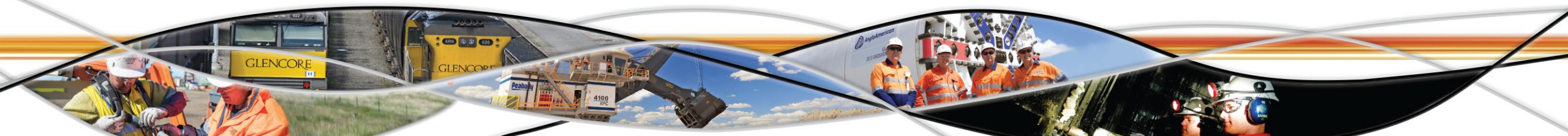
Case Study

An excavator was being used to remove an old spoil dump.

The material the excavator was working on was unconsolidated and the excavator tracks sunk.

This resulted in the excavator underbelly coming in contact with the ground surface. Subsequent tramming forced the spoil up into the slew circle.

A risk assessment was conducted by the crew with the aim of determining a safe way to remove the compacted spoil from the slew circle.

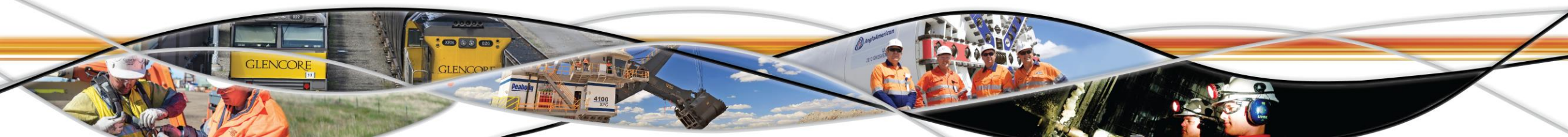


Case Study

It was decided to dig a pit and tram the excavator over the pit.

The crew would then work under the excavator with pinch bars and pick out the compacted spoil.

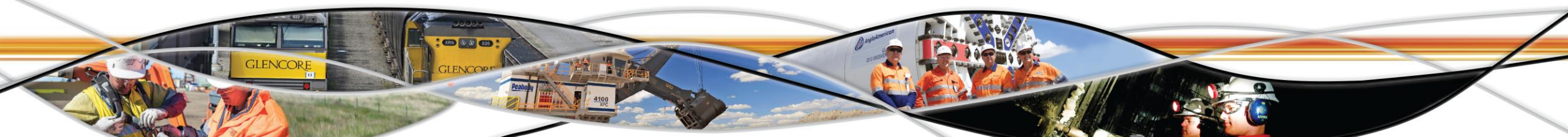
The work commenced and it was soon found that the pinch bars were too long for the confined space so they were cut down to allow better access to the slew circle area.



Case Study

During the scaling operation there was a large fall of material from out of the slew circle.

Two workers, who were engaged in the task, were buried and suffered life threatening injuries.



Case Study

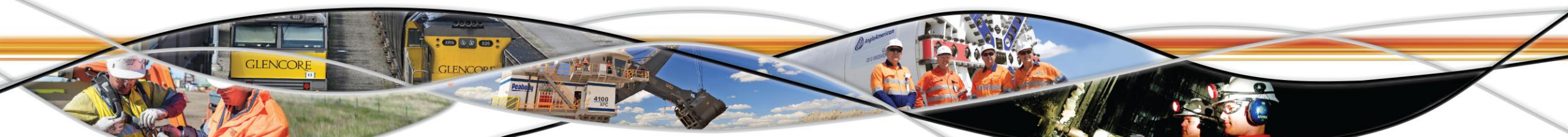
Although a risk assessment had been conducted and the risk of falling material identified, a serious incident still occurred.

Observations included:

1. The work group ranked the consequence of the falling material to be of moderate severity.

2. The control identified was to not work directly under the compacted material however this was not possible with the cut down pinch bars.

3. The work was inspected by a number of supervisors and senior management personnel before the incident occurred but no one claimed they saw any one working directly under the material.



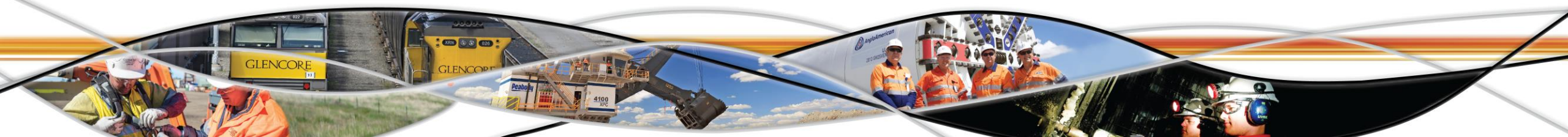
During the investigation the following observations were made:

1. No member of the team had conducted a task like this before.
2. All the team were open cut operators who had not been exposed to the underground concept of “not working under unsupported ground.”
3. The likelihood of the material falling was considered low because of a belief that it was sufficiently compacted and sticky so that it would not fall out.

Individual Factors

4. Although the falling material hazard had been identified by the crew, the potential for a serious injury or fatality was not recognised.
5. The younger team members accepted that the practice must be safe because older team members were involved in the risk assessment and they had not raised concerns.
6. Rotation of team members under the excavator was considered a control to reduce exposure to the hazard of falling material.

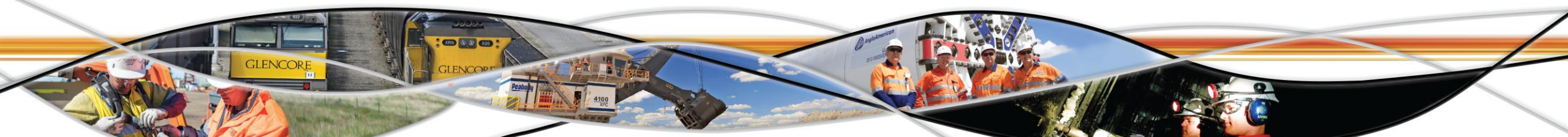
Group Dynamics



Common Pitfalls of Risk Assessments *

- Failure to identify all hazards associated with a particular activity
- Failure to consider all possible outcomes
- Only considering the risk from one activity
- Inappropriate use of data
- Inappropriate definition of a representative sample of events
- Inappropriate use of risk criteria
- Making decisions based on individual risk estimates when societal risk is the appropriate measure
- Not involving a team of people in the assessment or not including employees with practical knowledge of the process/activity being assessed
- Carrying out a detailed, quantitative risk assessment without first considering whether any relevant good practice was applicable, or when relevant good practice exists
- Carrying out a risk assessment using an inappropriate practice
- Dividing the time spent on a hazardous activity between several individuals – the “salami slicing” approach to risk estimation
- Ineffective use of consultants
- No consideration of ALARP arguments (i.e. using cost benefit analysis to argue that it is acceptable to reduce existing safety standards)
- Not doing anything with the results of the risk assessment
- Not linking hazards with risk controls
- Carrying out a risk assessment to attempt to justify a decision that has already been made
- Using a generic assessment when a site specific assessment is needed

* Health Safety Executive UK Government, *Good Practice and Pitfalls in Risk Assessment,* Research report 151, 2003

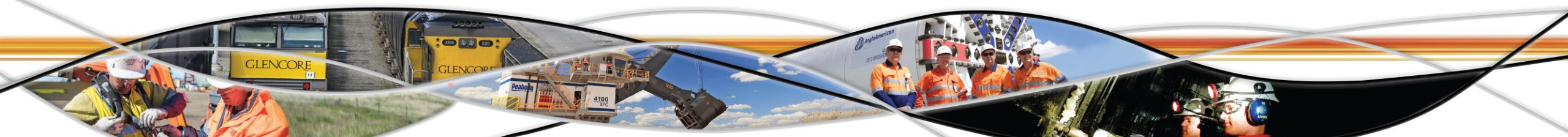


Recommendations to improve the WRAC Process

Recognising the three levels of influence on the risk management process is the first step towards improving the end result.

Strategies must address factors that affect:

- The individuals perception of risk
- Group dynamics and the risk of group think
- The environment or context set by the organisation

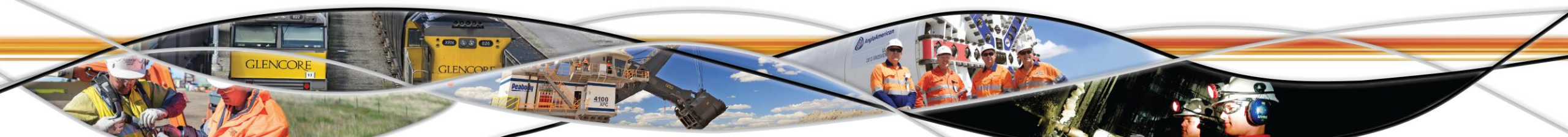


Three strategies to overcome poor risk perception

1. Ensure some of the participants have the relevant experience and expertise in relation to the hazard being assessed. This can be assessed in terms of the:
    a. Geographical extent of their experience
    b. Personal history of working with the hazard

2. Involve the people who will be working with the hazards associated with the task.

3. Choose participants that have a high regard for working safely.



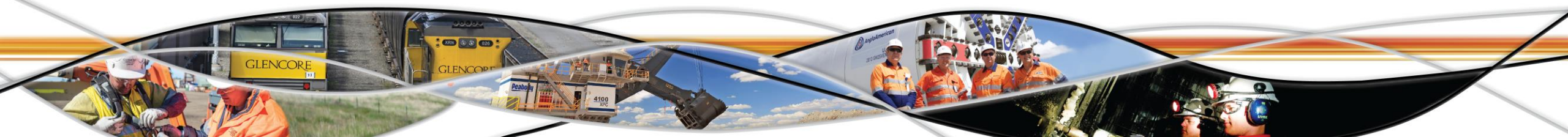
Three Strategies to Overcome Poor Group Dynamics

1. Ensure the participants have a spread of backgrounds. Again this can be framed in terms of:

    a. Geographical extent of their experience
    b. Personal history of working with the hazard

2. Allow dissent amongst participants and the opportunity to explore concerns that are raised

3. Use a good facilitator who understands the risk management process, can recognise group think and will encourage participation by all participants

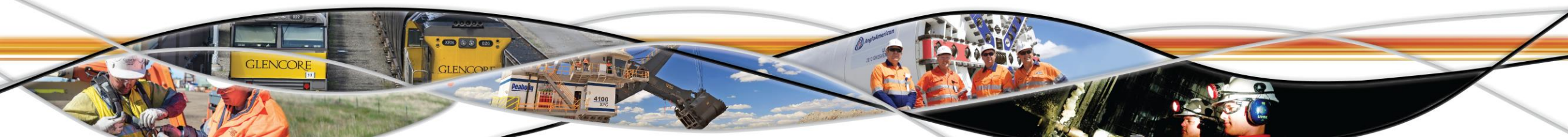


Three Strategies to Address the Organisational Environment

1. Ensure the organisation has a good risk management process.

2. Ensure that the purpose of the risk process is to prevent injury and that this is understood by all participants.

3. Ensure that the controls identified in the risk process are actual controls and are implemented.

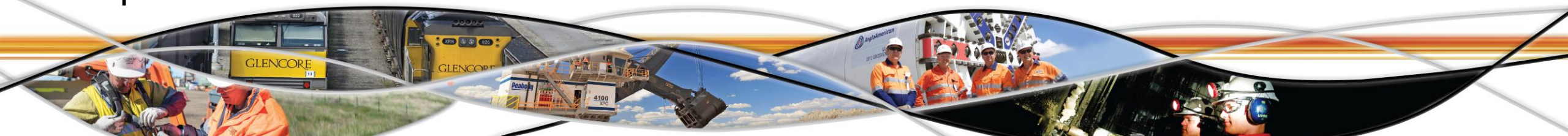


Summary

1. The WRAC process is not a quantitative assessment. Risk ratings are given without reference to real world data. In most cases real data is either difficult to obtain or does not exist.

2. The risk ratings are subjective and influenced by the individual participants perception of risk, the dynamics of the group performing the assessment and the environment set by the organisation.

3. Some strategies have been suggested in terms of the selection of the participants, the manner in which the group is facilitated and the organisational support required to improve the outcome of the WRAC process.



Acknowledgements and References

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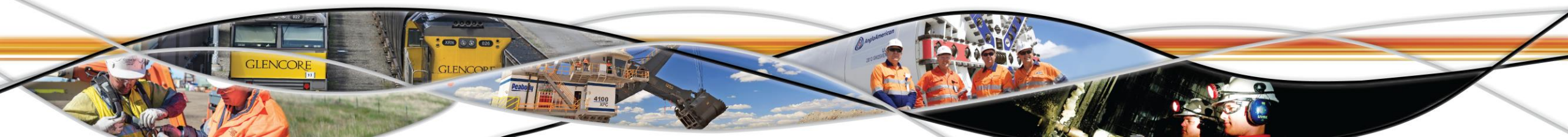

Questions?