



CASE STUDY.

# Rock Falls in Cuttings.

A FRESH APPROACH FOR RAILWAYS.



## BACKGROUND

Large rocks falling onto tracks in cuttings are a major hazard that affects many Australian railways. A train colliding with a large rock can potentially result in significant loss of life and major service interruptions.

“R2A have developed precaution-based processes for the rail industry.”

Railcorp<sup>1</sup>, in trying to resolve the rock fall issue at Lapstone Cutting, initially took the traditional hazard based approach. This was unable to solve the problem. In search of a fresh view, Railcorp then consulted R2A.

R2A recommended the application of a precautionary, due diligence approach rather than hazard based risk assessment. The outcome of the R2A assessment is detailed in the diagram below.

This provides a model case study of how the precaution-based process can be applied to other organisations in the rail industry.

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<sup>1</sup> Francis, G. E. & Robinson, R. M., The Implications of Common Law Due Diligence. In: *CORE 2010, 14 September 2010, Wellington*.



## ALTERNATIVE APPROACH

Typical hazard-based risk assessments can be undertaken, however these cannot prevent all rock falls.

### Why an alternative approach was sought?

When a typical hazard-based risk assessment process is undertaken, the focus is on preventing rock falls. This involves identifying sites that may create a rock fall and assessing and ranking them on some quantified risk (likelihood and consequence) basis, usually down to the target level of risk and safety. The difficulty with this is that it does not matter how much work is undertaken, preventing all rock falls all the time is impossible.

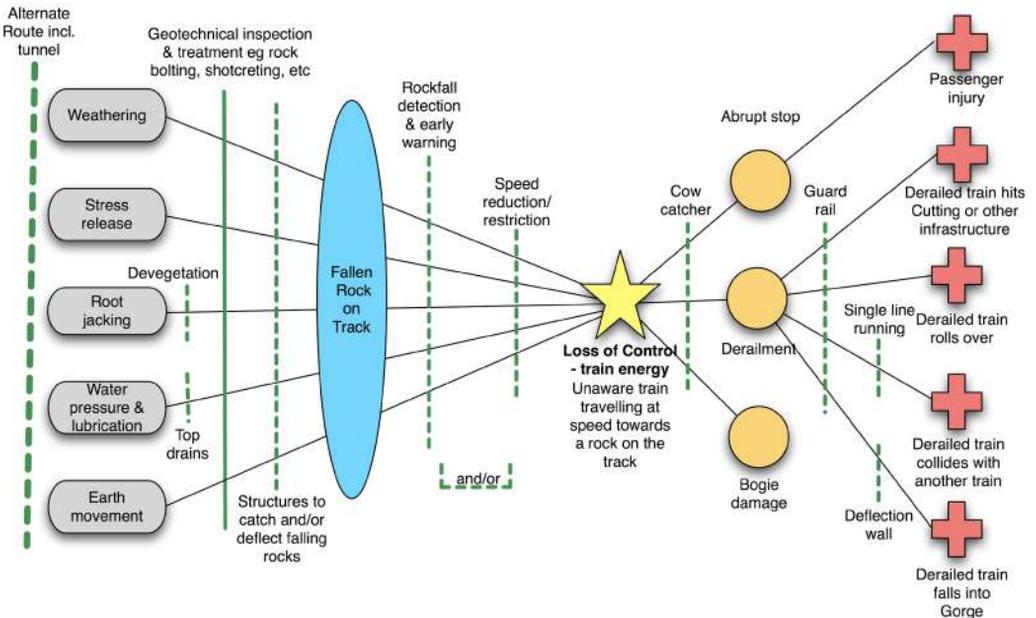
So if a rock fall occurs and a fatal train collision results, judicial inquisitions will commence. The fact of the occurrence of harm at this point is certain so its previously expected likelihood or risk is irrelevant.

To paraphrase a judge in NSW following a serious train incident: *What do you mean you did not think it could happen? There are seven dead.*

# RAILCORP'S APPROACH

## The RailCorp Alternative Approach

Acknowledging the limits of the hazard-based assessment when assessing rock falls, RailCorp adopted an alternative precautionary approach using threat barrier analysis, based around the legal loss of control point. The primary hazard is not the falling rock; rather it is the loss of control of train energy if a big enough rock is struck.



## The Process

The review combined generative interviews with key stakeholders followed by an expert stakeholder workshop. To ensure context and that no key issues were overlooked during the review, a number of completeness checks were done including the identification of:

- Possible rock fall threat scenarios;
- Critically exposed groups; and
- Train types.

“RailCorp’s risk mitigation examines all precautionary measures.”

## The Advantage of this Approach

The advantage of this approach is that by focusing on examining all of the precautionary measures available in preventing the loss of control of train energy as a result of rock falls; a more holistic view in risk mitigation is presented, as opposed to just trying to eliminate rock falls.

Of course, this does not mean that obvious rock fall sites ought not to be addressed. The point is that it is done in the context of all the available precautions and all the other cuttings for which RailCorp is responsible.

## CONCLUSION

By implementing the precautionary approach, RailCorp were able to identify a number of potentially robust, yet economic barriers to mitigate the risk and take action to implement the best (and legally defensible) risk management option.

Such an approach is entirely consistent with the provisions of the Work Health and Safety Act due to commence in Australian jurisdictions by 1st January 2012, a position that has been tested and confirmed with various legal counsels.

Contact R2A for further information.



## WHERE TO NEXT

Talk to R2A  
about your  
next project.

If you would like to know more about how to manage due diligence in your business you can:

- Contact R2A to organise a briefing for your executive management team.
- Book an In-House Course or Private Briefing.
- Buy a copy of the 9th edition R2A text: Risk & Reliability: Engineering Due Diligence. Order online.
- Receive R2A's email newsletter.
- Attend the two day Engineering Due Diligence Workshop presented by Richard Robinson.
- Attend the one day Defensible Risk Management Techniques course presented by Richard Robinson on behalf of Engineering Education Australia.
- Enrol in the postgraduate unit 'Introduction to Risk and Due Diligence' Postgraduate Unit at Swinburne University, also presented by R2A.



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