

Derailment of passenger train

Issued to: All Network Rail line managers, safety professionals and RISQS registered contractors

Ref: NRB 18/03

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Location: Loch Eilt, Scotland

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Overview

At 06:47 at Loch Eilt near Arisaig the 06:03 Mallaig to Glasgow Queen Street train struck the debris from a landslip and became derailed.

The ground rises sharply away from the railway for much of this section on natural mountainside slopes. The ground is a mixture of rock outcrop and shallow soil overburden. In most parts it is relatively free from trees. Naturally formed gullies provide waterpaths down the mountainside.

A review of the hillside in the Loch Eilt location was carried out following an earlier small washout and risk mitigation work implemented in Autumn 2016. Three long sections of the line (covering circa 3 miles) were assessed in detail for the likelihood of debris flow and rockfall by geotechnical engineering experts.

It was decided to carry out a number of small interventions (fences and debris flow barriers) rather than a single solution at just one location. The work comprised lightweight boulder catch fences and debris flow barriers across gullies which were designed to contain a 20m³ flow.

This failure appears to be a moderate to large debris flow (as much as 400m³) that commenced in excess of 50m beyond the railway boundary. The location does not coincide with any previously known deep gully features, although there may now be one formed by this event.

The location was included in the 2016 engineering work and rockfall was deemed to be the greatest risk. Rockfall barriers (catch fences) were installed. These were designed to prevent individual boulders from reaching the track and were not intended to prevent a debris flow such as this. They may have helped to disrupt or slow the initial flow but would quickly have been overwhelmed.

The cause of the slip is likely to be saturation of the soil overburden. The 24 hour rainfall total was circa 20mm which is unlikely to be sufficient on its own to cause the event but a rapid temperature rise will have contributed to snow melt and sudden release of water from the hillside. RAIB has identified the combination of rain and melting snow as a factor to explore in its investigation.

Discussion Points

While we are investigating the incident please discuss the following with your team:

- What potential improvements could be made to your adverse weather plans in light of this incident?
- What actions could you take to help improve these while the investigation is concluded?
- How should the safety of the immediate area around an earthwork failure be assessed and treated by first responders whilst awaiting specialist assistance from the RAM team or Earthwork Examiner?
- How is the Extreme Weather Action Team (EWAT) process designed to help prevent or minimise the impact of such incidents?
- How could your EWAT process be improved?

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