

Learning Brief: #023

Date: 19/04/2022

Carmont train accident

This learning brief is shared in order to promote learning and improve safety. You should seek appropriate guidance regarding the relevance, accuracy, and completeness of this alert to your circumstances prior to implementation.

Theme

Hazard & Risk Assessment
Management of Change
Human Factors & Procedures
Infrastructure Status & Records

Summary of Learning

Extreme weather events can cause disruption but can also cause fatal accidents. It is important to appreciate that climate change means that extreme weather events are likely to increase and that risk assessments, processes and procedures need to be adapted accordingly.

Description

At around 09:37 on Wednesday 12 August 2020, a passenger train struck debris washed from a drain onto the track near Carmont, Aberdeenshire, following very heavy rainfall. It was returning towards Aberdeen due to a blockage that had been reported on the line ahead. The train was travelling at 73 mph, just below the normal speed for the line concerned. The collision caused the train to derail and deviate to the left, before striking a bridge parapet. This caused the locomotive and carriages to scatter. Three people were killed and six were injured as a result.

The Rail Accident Investigation Branch (RAIB) investigated and found that the debris had washed out from a 15-metre length of steeply sloping drainage trench. The trench had not been installed per design. This made the gravel in the trench vulnerable to washout if large flows of surface water concentrated onto a short length of drain. Such was the case after the heavy rains experienced in the area at the time of the accident.

People Barriers

1. Custom and practice in Scotland's route control meant that extreme weather action team meetings were not always convened when required by Network Rail's processes, and no such meeting was called on 11 or 12 August 2020 despite forecasts of severe weather.

Process

1. Network Rail's process for initiating the inspection and maintenance of new drainage works had not been correctly applied. Consequently, it is likely that the upper section of the drainage system had never been inspected since its completion.
2. The health and safety file for the Carmont drainage works could not be found. There is evidence that Network Rail's processes related to the creation and management of health and safety files were not being correctly applied in Scotland and elsewhere in the UK.
3. Network Rail's management processes had not addressed weaknesses in the way it mitigated the consequences of extreme rainfall events. It had not sufficiently recognised that its existing measures did not fully address the risk from extreme rainfall events, such as summer convective storms.
4. Network Rail's management assurance processes did not highlight the extent of any areas of weakness in the implementation of extreme weather processes in route controls, or that the controllers lacked the necessary skills and resources to manage effectively complex weather-related situations. Consequently, significant areas of weakness in the railway's risk mitigation measures were not fully addressed.
5. The railway industry's risk assessments had clearly signalled that earthwork/drainage failure due to extreme rainfall was a significant threat to the safety of the railway. However, they had not clearly identified potential areas of weakness in the existing operational mitigation measures. Despite an awareness of the risk, Network Rail had not completed the implementation of additional control measures following previous events involving extreme weather and the management of operating incidents. It is possible that better delivery of change in response to safety learning would have resulted in actions that would have prevented, or mitigated, the consequences of the accident at Carmont.

Plant

1. Maintenance may be delayed due to COVID issues.
2. The re-start of paused operations may increase risks or introduce new risks.
3. Supply chain may be disrupted so new parts or labour may not be readily available.

Consider how your People, Plant and Process controls or barriers may be affected directly or indirectly by extreme weather events. Review risk assessments and scrutinise any changes to due process with care, keeping an eye on the 'big picture'. Listen to concerns on the ground. The workforce are often aware of creeping change and issues and may need additional support to tackle their concerns effectively.

In addition to considering People, Plant and Process, consideration should be given to Major Accidents due to external and natural causes. Accidents with natural causes are now commonly referred to as NaTechs (Natural hazard triggered technological accidents). Natural hazards can both initiate and exacerbate the consequences of Major Accidents.

- Due to climate change, it has been recognised that the risk of NaTechs is increasing – extreme weather events and associated climate impacts (e.g. sea level rise) are becoming more frequent and more severe. The threat to present day process safety might be considerably greater than when installations were originally designed and will likely continue to worsen over the remainder of an establishment lifetime.

The change in NaTech threats can be thought of and managed within existing change management procedures, alongside other creeping changes. If the change in NaTech risk goes unmanaged then an installation can be taken outside of its safe operating envelope without the recognition of the operator.

Further reading

1. RAIB, [Derailment of a passenger train at Carmont, Aberdeenshire, 12 August 2020](#)
2. CIA [Safeguarding chemical businesses in a changing climate](#)
3. OECD [Impacts of natural hazards on hazardous installations](#)
4. Process Safety Forum, [Knowledge Exchange Note 004 Management of Change](#)

The Process Safety Forum has been set up to provide an industry association platform whereby initiatives, best practice, lessons from incidents and process safety strategy can be distilled and shared across sectors, to influence our stakeholders (including the Regulators), and to drive the process safety management agenda. The Process Safety Forum consists of representatives from across industry, refer to the website for details

The website is www.p-s-f.org.uk.