



Rail Accident Investigation Branch

Investigating organisational factors in the Bradford Interchange runaway

Investigation seminar 2019

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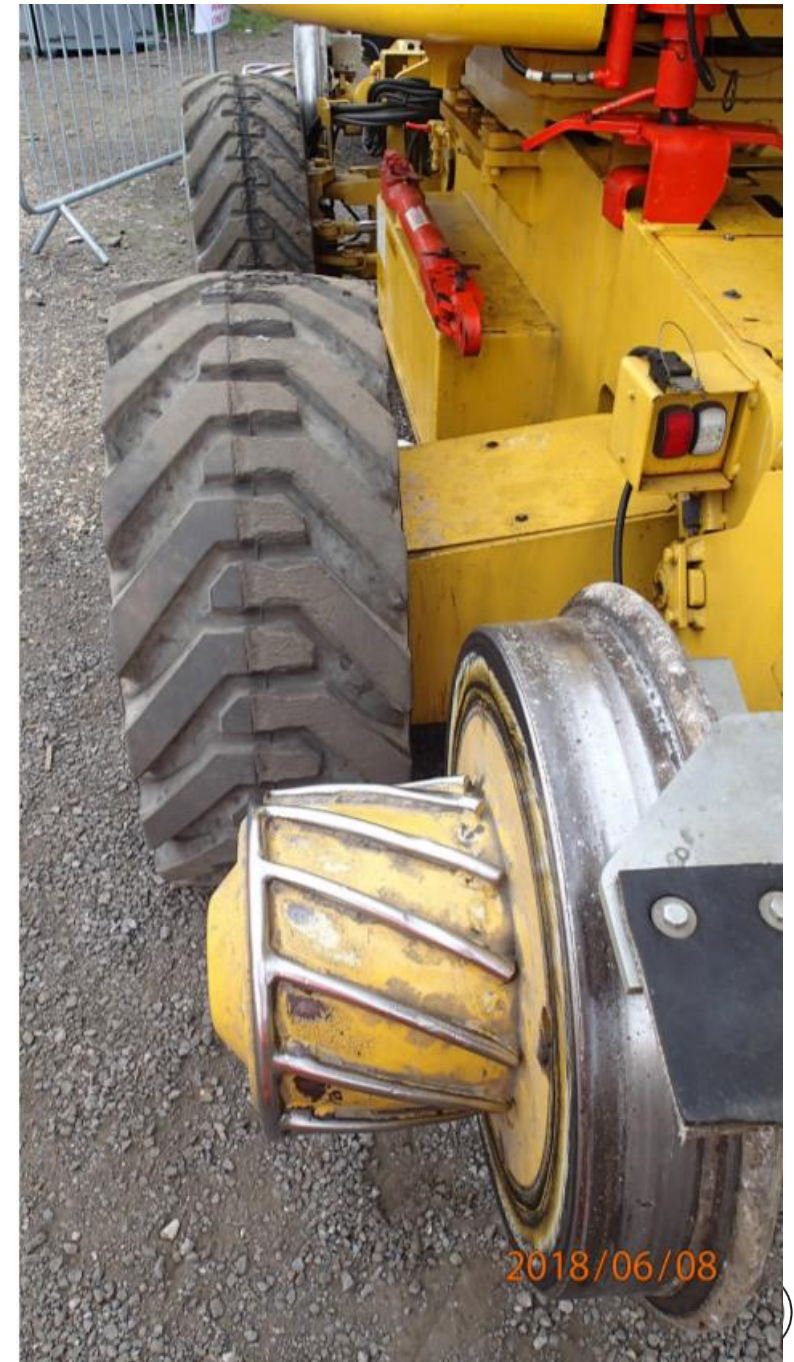
Runaway at Bradford Interchange



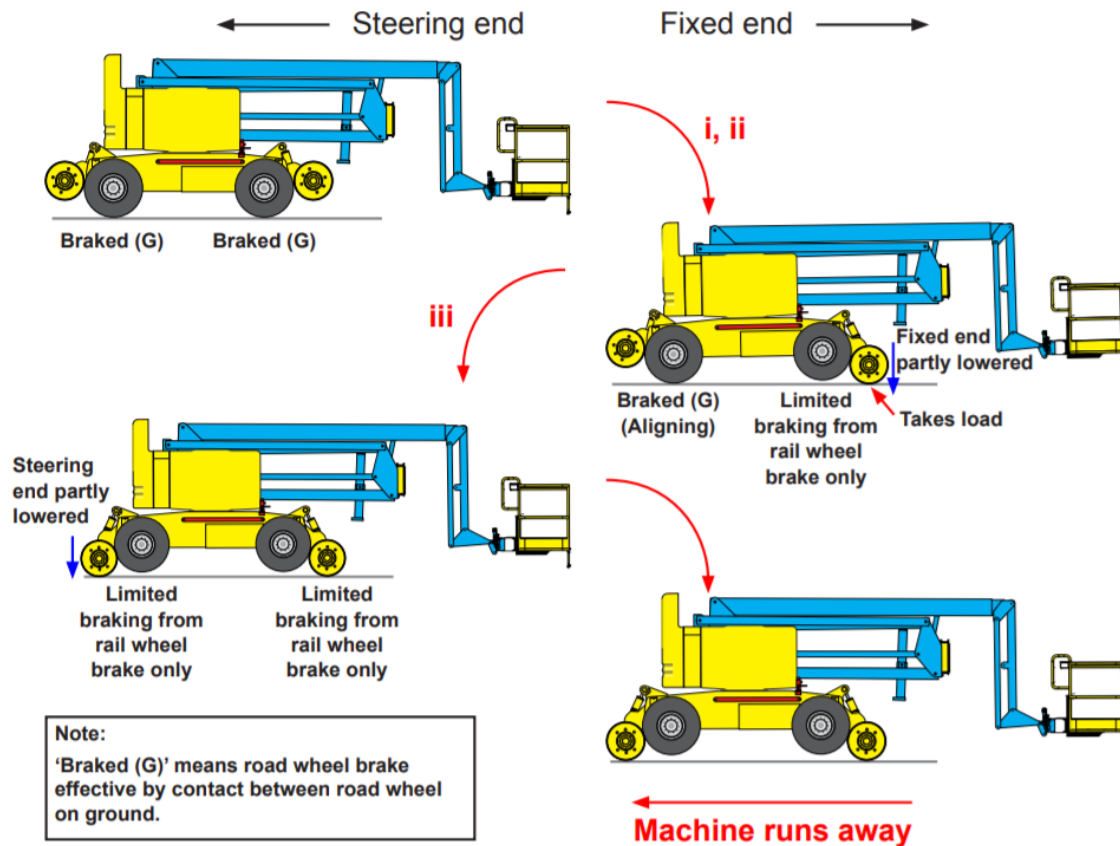
- What happened?
 - At 01:40 hrs on 8 June 2018, a 17.5 tonnes Mobile Elevated Working Platform (MEWP) ran away while being on-tracked at a Road Rail Access Point (RRAP) south of Bradford Interchange station
 - Ran downhill for approximately 340 metres before coming to a stop
 - One track maintenance staff in its path was warned in time (5 to 8 seconds)
- Why did it happen?
 - The machine operator (MO) did not follow the industry-wide on- and off-tracking principle and partially deployed both rail axles
 - The MEWP Direct Rail Wheel Braking (DRWB) system was not effective as it had not been maintained properly

MEWP

- Genie Z60 – Type 9b RRV with DRWB



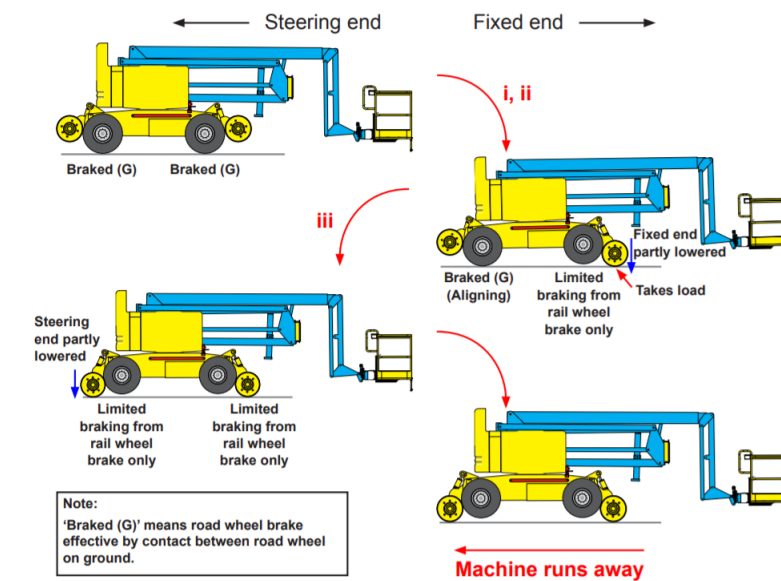
MO incorrectly deploying the MEWP



- MO:

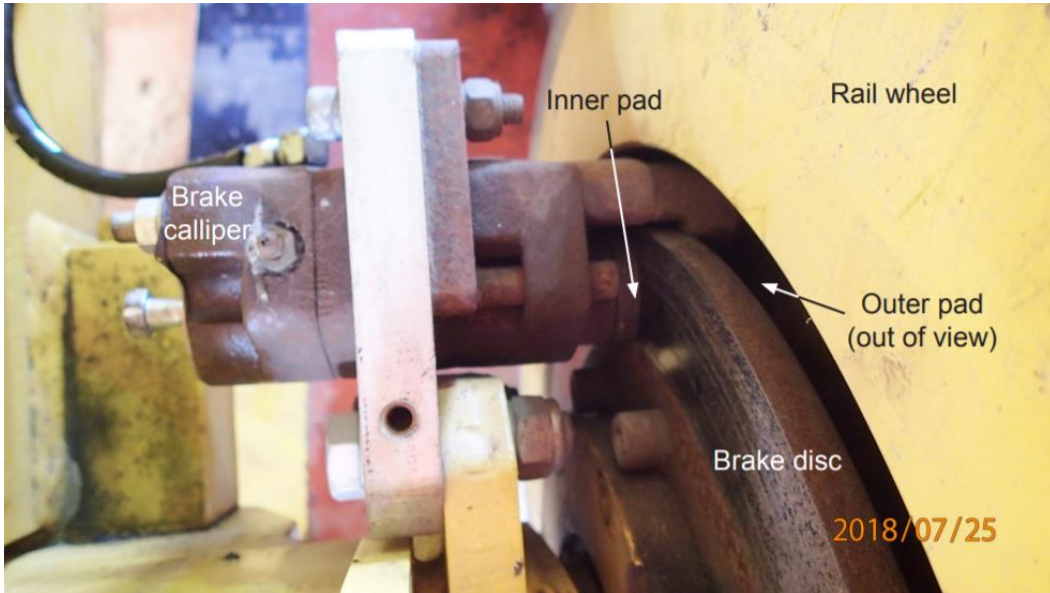
- Had relevant tickets to demonstrate 'competence' in accordance with NR's processes (since 2016)
- Had been trained on same MEWP type, learning the on- and off-tracking principle
- Had routinely not been following the on- and off- tracking principle

Organisational Factors – Machine Operators actions



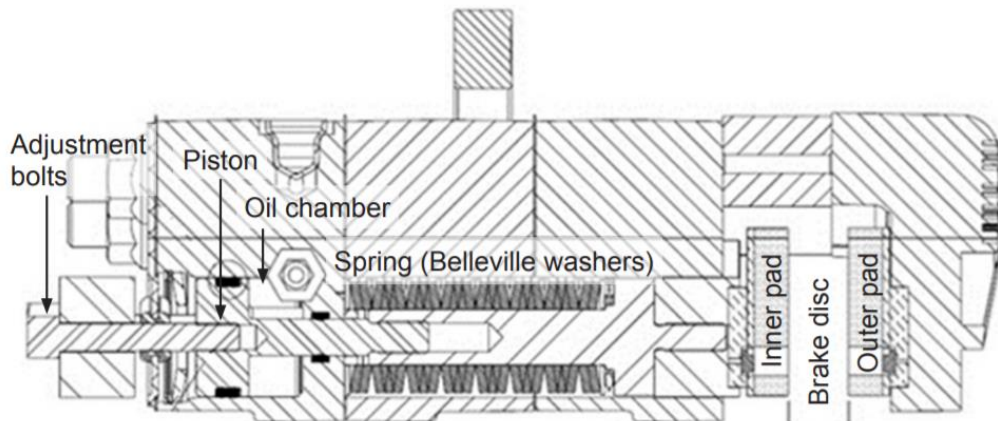
- MO was routinely not following the on-off tracking procedure but his employer had not identified this because:
 - It did not follow its own recruitment process
 - Once in employment, the ongoing competence of the MO had not been checked (no mentoring or monitoring by line manager or POS Rep)
 - Symptomatic of deeper problem with industry's management of MO competence

Fitters not maintaining the DRWB in accordance with OEM instructions

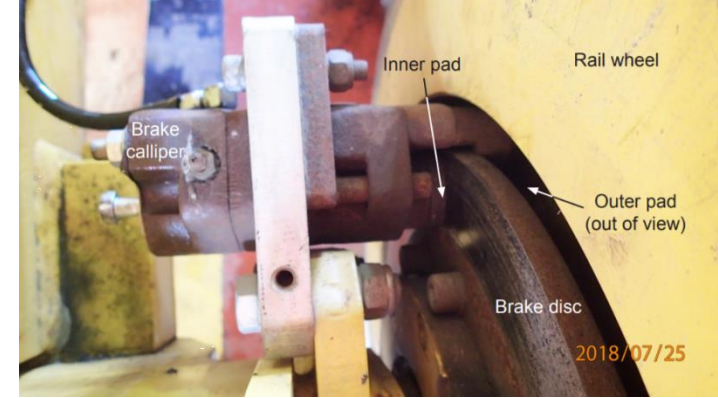


- Fitters:

- Competent to the relevant Rail Plant Association assessment modules (2-yr cycle)
- Had been provided with relevant OEM instructions and forms created by employers to complete
- Were routinely not following the OEM instructions and just ticking the forms



Organisational Factors – Fitters actions



- Fitters were routinely not following the OEM instructions but the employer had not identified this because:
 - Poor design of the employer's inspection form for the DRWB
 - Lack of associated training when DRWB system introduced
 - Lack of supervision and/or audit of fitters
- Inadequate testing regime of MEWP braking systems
- Failure to adopt the latest version of the OEM instruction

Investigating organisational factors

- Used a 5-questions approach (derived from work done within ERA)
- When looking at any factor, ask:
 1. What happened?
 2. What should have happened?
 3. Source of variability: why is there a difference between 1 and 2?
 4. Did the organisation know there was a difference between 1 and 2?
 5. If yes, what did the organisation do about it? If not, why didn't they know?
- The 5 questions approach brought rigour to the examination of each factor
- Any of the answers to question 2, 3, 4 or 5 could become an individual factor which can be further explored with the 5 questions

Bradford Interchange example

- ***MO was not deploying RRVs in accordance with the on- and off-tracking principle***
 1. What happened? MO partially deployed rail axles
 2. What should have happened? MO should have fully deployed one rail axle before deploying the other one
 3. Source of performance variability? MO did not think it was important to follow the procedure because of his previous experience of working with MEWPs fitted with either hydrostatic drive or DRWB
 4. Did his employer know about it? Employer's managers unaware of fact that MO not applying procedure
 5. Why didn't they know? Employer didn't check he needed refreshing during his recruitment and no mentoring/monitoring/auditing of MO post-recruitment

Closing note

- Just in case you thought that we are fine now as most of our machines are type 9a with hydrostatic drives anyway
- At 16:20 hrs, on 7 June 2018, a 12-tonnes ART17-TH MEWP ran away while being on-tracked near Ensjø metro station (Norway)
 - Ran downhill for approximately 150 metres before colliding with another MEWP and derailling
- ART17-TH is a type 9a RRV (hydrostatic drive) designed in the UK
- It was *designed* for the brakes to release during on- and off- tracking
- <https://www.aibn.no/Railway/Published-reports/2019-04-eng>

Engineering safeguards like the fitment of the DRWB or hydrostatic drives cannot always be relied on. We need to always recognise the role that humans and organisations play in assuring safe operations. We also need to work at keeping our corporate memory.