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Network Rail Safety Bulletin

Wrong-side failure of track circuits due to rust on the rail head

For the attention of all signallers, and personnel responsible for entry into service of new or out of use rail

This Safety Bulletin is produced following a number of incidents where rail has been brought into use for train running and the track circuit connected to those rails has failed to operate correctly. This is because a layer of rust had formed on the rail head, preventing electrical contact being made with the train wheels until the rust was worn away. When this happens, there is the potential for points to move under a train or a collision to occur.

This Safety Bulletin does not apply to rail brought into use in areas with no track circuit train detection.

Its purpose is to alert railway staff of the need to advise the signaller when rail is brought into use for train running and could be rusty, whether due to installation of new rail, or where traffic has not operated over a line for a period of time.

If you are the signalling tester responsible for bringing new or out of use rail into use in a track circuited area, you must advise the signaller that there may be rust on the rail head, specifying the affected area.

Introduction

Following a recent incident where a track circuit lost detection of a train as it passed over newly installed rail, an investigation found that the surface of the rail head was coated with rust, forming an insulating layer. This meant that as the train's wheels passed over the rails, the current could not flow through the wheels and axle from one rail to the other to activate the track circuit relay the train was not shown occupying that section of track. As a result, the interlocking could have allowed a conflicting route to be cleared for another train, leading to a collision; or for a set of points to be moved under the train resulting in a derailment. Fortunately this did not occur, but as the passage of the train was not detected in the normal order, the signaller had to intervene to cancel the route and reset it for the next train, which could have delayed it.

Notifying the signaller when rail is brought into use

Responsible Signalling Tester

Before newly installed or out of use rail that has a visible coating of rust on the rail head as per the photograph is brought into use for train running, the responsible signalling tester must notify the signaller of the extent of the rail being brought into use. This can be either the track circuit(s) affected or the signals/points outside the affected area, making clear to the signaller the possibility of rusty rails preventing the track circuits showing occupied.

Signaller

Once notified that a section of rail has been brought into use for train running, the signaller will:

- Carefully watch the track circuit indications concerned as each train passes over it
- keep signals at danger to protect trains as they pass over it
- keep points in the correct position for each train passing over it and apply reminder appliances
- not rely on the track circuit until a train has correctly operated it.

Well used rail provides a good conductive surface for track circuits, whilst rust on unused rails does not.

For further advice, contact Daniel Paxton, Engineer [Signalling & Controls],
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Issued by the Professional Heads, Signalling & Telecoms, Track and the Operations Principles & Standards Manager