



European Rail
Infrastructure Managers



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EIM POSITION PAPER ON THE NEED FOR ADD (AUTOMATIC DROP DEVICE) - SURVEILLANCE TO BE INTEGRATED IN PANTOGRAPHS.



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EIM Position Paper on the Need for ADD (Automatic Drop Device) – surveillance to be integrated in pantographs.

Introduction

A defective contact strip on a pantograph can cause serious damage to the overhead contact line, either because the sweep of the contact wire across the contact strip is blocked or because the top of the pantograph goes unintentionally high or otherwise acts like a hook. The use of ADD- protection will limit the damage to the pantograph itself and prevent consequent damage to the contact line and resulting traffic interruption.

The ADD-monitoring can be designed with integrated and pressurised air channels in the contact strip or another method for detecting the same problem.

The protective function is essential in order to limit the damage to both the train/pantograph itself and the contact wire and hales to define the location of the defect. Thus ADD helps to reduce costs and the severity of defects, both to the train and to the infrastructure, independent of the cause.

The TSIs should, in the view of EIM, prescribe the use of ADD for all pantographs on new rolling stock, however the infrastructure manager may state when ADD is not necessary on specific parts of their network.

Any cost-benefit analysis of ADD should consider the significant costs that would result from damage to pantographs not equipped with ADD, and not be limited to just pantograph costs and the ADD system itself.

Why an installed ADD protective device is useful for all pantographs

When damage occurs to pantograph contact strips, the damage to the pantograph itself is only part of the overall cost arising from such incidents and perhaps also not the dominant cost.

Other costs include:

- Traffic interruption to the train concerned
- Traffic interruption and delays for other trains including trains of other railway undertakings, with consequent increases with traffic density.
- Cost of rescue and need for additional locomotives to haul defective trains. In the case of serious pantograph damage other equipment on the train's roof may also be damaged. Staff might then have to climb up on the roof and carry out emergency repairs such as removal of loose parts or securing equipment in a safe position. This makes it necessary to disconnect and earth the power supply.

- Repair of the overhead contact line with the consequent shut down of the line concerned

ADD as a cost minimizing tool

When ADD protection is not installed, the driver may continue to drive after damage occurs because an obvious malfunction may not arise from the broken contact strip.

The risk of more serious damage, for instance the complete destruction of the pantograph and perhaps other equipment on the rolling stock roof and consequent damage to the overhead contact line is then considerable.

Combined with a routine for the use of the other pantograph (if installed) or an inspection from the ground by the driver, the ADD helps to limit the damage to only the contact strip itself.

This will also enhance the availability of the vehicle because the time needed for repairs is shorter due to the reduced damage sustained. If the faulty traction unit is fitted with a redundant pantograph this can be used to continue the journey.

The interaction between the contact strip and contact wire is sensitive to faults in both areas, which propagates through the system. The installation of ADD will limit the propagation of these faults. Maintenance and inspection routines for the pantograph are not replacements for ADD monitoring.

However, since broken contact strips often do not lead to immediate pantograph malfunction, the exact location of the defect in the contact line may not be obvious. Reporting of activated ADD has the potential to be an efficient tool for finding the locations of defects in the contact line at an early stage where cost and consequence are still low for everyone.

Conclusion

The TSIs should prescribe the use of ADD for all pantographs on new rolling stock.

The infrastructure manager may state when ADD is not necessary on specific parts of their network.

The cost-benefit analysis on the use of ADD should not be limited just to pantograph costs. It should consider the significant damage, structural and operational costs that can result from the use of pantographs not equipped with ADD.