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AEGIS Case Study

Class 319/3, Low Adhesion Water Spray System Compliance

Client name: Water-Trak Ltd

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SCOPE/OBJECTIVE

Water-Trak has developed a novel adhesion enhancement System. During low adhesion events, Water-Trak provides a step-change improvement in braking and traction performance of T&RS. The first application was for trials on Class 319/3 units.

AEGIS Certification Services (ACS) were appointed as the 3rd Party Independent competent body to provide verification of this innovative concept.

THE TECHNOLOGY

It is well understood that water plays a key role in the adhesion between a train wheel and the rail head. A dry rail gives excellent adhesion - with friction coefficients as high as 0.3 to 0.5. A fully wetted rail, for example during rain, still provides a good level of adhesion with friction coefficients above 0.1. However, a small amount of moisture combined with contaminants such as iron oxides or leaf matter can lead to very poor adhesion. The friction coefficient can drop as low as 0.01, leading to serious problems for train braking and traction.

Water-trak works by disrupting this critical amount of water to create "rainy day" braking conditions. When low adhesion conditions are detected by the train Wheel Slide Prevention (WSP) system, water is dispensed in front of the leading axle of the train. This wetting of the rails, increases the adhesion level almost instantaneously, enabling an improved braking performance.

HOW WE HELPED

ACS provided a route to approval for Water Trak, to enable their innovation to be used under controlled conditions on a Class 319/3 unit to enable data collection to be gathered to enable its use to be placed into service under further trial conditions, during the autumn of 2021. This route to approval was undertaken at incremental stages to enable ACS to verify data collection gathered, initially at the Long Marston test track, then on a Signal Protection Zone then finally for operation on the national rail network.

ACS followed the principles of RIS-2700-RST to provide verification and issued Attestation Statements at each incremental stage for the design and provided construction conformance for the first unit at Allerton TMD.

OUTCOME

The Low Adhesion Water Spray System was installed on the Northern operated Class 319/3 units for operational use in the autumn of 2021, as a result the technology is to be applied to the Northern fleet of Class 170 units also for anticipated operation over the autumn period of 2021.

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