



Safety recommendation no. 126

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Safety deficit	<p>On Tuesday 26 July 2016 at 07:22, train 6 from Le Locle to Les Brenets, made up of railcar BDe 4/4 no. 5, derailed on open track at kilometre point 2.1, following failure of the leading axle shaft. No one was injured in this derailment. Apart from the axle breaking, damage to the railcar or the infrastructure were minimised. The derailment of railcar BDe 4/4 no. 5 was due to the failure of axle 4, the leading axle in the direction train 6 was moving. Factors contributing to the axle failure:</p> <ul style="list-style-type: none">– Inadequate layout of the keyway on the axle shaft;– Sharp angles at the intersection of the keyway and the journal fillet connecting the crown wheel and the wheel centre;– The state of the rough surface of the machining of the keyway;– The lack of a defined radius between the base and the keyway. <p>The axles are an essential safety element. Any modification or adaptation of the manufacturer's original design can modify the pressures on the axle shaft and may have negative consequences for safety in operation.</p>
Safety recommendation	The STSB recommends that the FOT, when ordering replacement axles, carries out dimensioning calculations on these axles.
Addressees	Bundesamt für Verkehr
Stage of the implementation	Implemented. The FOT is of the view that this safety recommendation is already covered by article 8 of the railway regulation (EBV) and the FOT guideline 'Railway Vehicle Approval'. A company that carries out modifications on railway vehicles must assess if these modifications are safety- relevant. In general, this approach is known to the rail way companies, either because of the numerous previous contacts with the FOT or from the Association of Public Transport (VöV) guideline (D-RTE 49100) which is based on the FOT guideline mentioned above. The procedure for the approval of railway axles for metregauge railways, such as the Le Locle – Les Brenets line, is also described in the FOT guideline 'Structure Variations for Metre- and Special-Track Railways'. In addition, an inadequate level of knowledge with regard to this process is amended during the random checks carried out by the FOT as part of periodic company inspections and audits. In view of this, the Vehicles Section does not see any need for special measures, because the calculation of the axle strength is systematically requested and checked for changes that affect the running gear.
Investigation report concerning the safety recommendation	Rapport final