



Safety recommendation no. 118

Date of the publication	24.04.2017
Number of the final report	2016030803
Safety deficit	<p>On 8 March 2016 at approximately 13:55 the tap changer fitted under railcar Deh 4/4 no. 52 of Matterhorn Gletscherbahn (MGB) train 532 exploded when the train approached the Fiesch-Ferierendorf stop. Subsequently, a second explosion happened in the railcar's engine room.</p> <p>The explosion can be attributed to evaporated insulating oil, which originated from an incorrectly set tap changer, being ignited by an arc when the isolating contactor was opened. As a commutation problem between the load switch and tap changer or a technical defect in the tap changer cannot be ruled out, it must be ensured that in the event of a tap changer malfunction, the main switch is triggered immediately and can no longer be reset. The lack of pressure monitoring in the tap changer constitutes a clear safety deficit.</p>
Safety recommendation	The FOT should ensure that railcars with a BBC high- or low-voltage tap changer are fitted with a pressure monitor for the tap changer.
Addressees	Bundesamt für Verkehr
Stage of the implementation	<p>Not implemented. The FOT notes that there are still many vehicles with a BBC high- or low-voltage tap changer. Upgrading all vehicles would be a substantial undertaking, in particular when it cannot be done as part of an overhaul or modification. The cause was not the lack of pressure monitoring but the incorrect installation of the tap changer when it was overhauled. According to the FOT, it is commonly known that the installation of tap changers is a very delicate process and requires relevant knowledge. This vehicle type was built in 1972 and has been in operation without issue ever since. In this case, an upgrade only makes sense if these vehicles remain in operation for a longer period of time, the tap changers still have several overhauls ahead of them and the workshop is no longer able to adjust and test the tap changers correctly. This statement generally applies to all vehicles with a high- and low-voltage tap changer. It does not make sense to fit all vehicles with a pressure monitor because of this single event which can clearly be attributed to incorrect installation. It should be left to the operating companies to decide if and to what extent an upgrade with pressure monitoring switches is carried out or whether other measures are not equally expedient. It appeared crucial that the companies should become and are aware of the problem that the assembly of tap changers as part of an overhaul requires relevant knowledge. This needs to be systematically maintained and taught where necessary. On 16 November 2017 the FOT sent a corresponding circular letter to the owners of vehicles with a high- and low-voltage tap changer. In this, the case is described in general and the companies are asked to</p>

raise awareness amongst the specialists accordingly, to train them where necessary and to ensure that the required level of knowledge is maintained.

**Investigation report concerning
the safety recommendation**

Vorbericht
Schlussbericht
