**HU-5986 (2018-0068-5, 2018-1588-5 and 2019-0170-5)**

**Railway accident / Derailment**

**Overview of the occurrence**

On 21 January and 23 December 2018, and on 16 February 2019, the tram № 52 (type TW 6000) wished to travel in the turnout direction on the Switch № K1602. While rolling over that switch, two axles of the leading bogie derailed, in each of the three cases.

The IC attributed the occurrences to a technical problem related to the switch, and to carelessness of the tram drivers involved.

The operator of the network corrected the setting of the double tension spring.

We sustain our earlier recommendation relating to clarification of the text of the instruction, and to making the tram drivers aware of the contents implied by the signal.

**BA2017-08050-5-01:** *The investigation found that the switchpoint light of the switch involved in the occurrence is not suitable for displaying the end position of the switch reliably, although the signal displayed would indicate accurate end position according to the definition of the displayed signal in the instruction.*

**Transportation Safety Bureau recommends Budapesti Közlekedési Zrt. to consider reviewing the harmony of the technical solutions and rules of signalling applied with the switchpoint lights along the tram network of the Company, and to take action to reach harmony between the rules and the capabilities of available technical equipment.**

*By acceptance and expected implementation of the safety recommendation, the switchpoint lights applied may provide true information or can be interpreted with taking their limitations into account.*



**Figure: The tram which derailed in December 2018**

**3. CONCLUSIONS**

**3.1 Direct causes**

The direct causes of the occurrence were as follows:

a) the switch was left in an intermediate position,

b) which the tram driver did not realise.

**3.2 Indirect Causes**

Those findings relating to competences, procedures and maintenance which are related to the factors enumerated above:

c) the switchpoint lightdisplayed a pattern which hinted at end-point position even when the switch was in an intermediate position.

**3.3 Root causes**

Causes that are distant in time and space from one another but which are related to system operation within the regulatory environment and in the safety management system:

c) the tram drivers report only a few of the malfunctions they detect (2.2.4),

d) the Instruction provides no useful, consistent rules relating to the switchpoint lights or the reliability of the information they display (2.2.3).

**3.4 Other risks**

The IC makes no such statement.

**4. ACTIONS TAKEN**

As far as the IC knows, the spring force was corrected. The operator of the network expressed their intent to replace the switch positioning equipment involved in the occurrence.

**5. SAFETY RECOMMENDATION**

TSB issued no safety recommendation during the investigation. A safety recommendation had been issued earlier, during investigations of similar occurrences, in order to create better match between the switches and the rules relating to them.