Subject: Re: SI units in railML 3.x
Posted by   on Tue, 16 Jan 2018 20:15:13 GMT
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Dear Vasco,

the first (and most strange example of non-SI-units in railways) I think of is: Brake abilities of railway vehicles are not measured in m/s² but in tons ("braking mass" compared to a certain "default braking carriage" of 192x). They are printed on each UIC/RIC vehicle; any attempts to standardise them with SI units failed on the huge task of re-labelling all European wagons - and on the lack of agreement of all members.

The pressure of air (brakes) or steam (boilers, cylinders) is measured in atm instead of Pa.

There are plenty of examples of "scaled" usage of SI units such as you already mentioned: Distances in km instead of m, gauges in mm instead of m, speeds in kph instead of m/s, times in minutes instead of seconds, masses in tons instead of kg, forces in kN instead of N, power in kW instead of W, voltages in kV instead of V. I think railML does not need to care much about but apply them freely as usual in railway sector without regarding it as "break of the golden rule" - they are still SI if they are scaled with SI factors such as "kilo" or "mega"!

I think a good example is the XML dateTime type which already allows a free usage of time derivatives from seconds to minutes, hours, days, years... If railML would really very strictly apply the "golden rule", we would need to drop all dateTime and use seconds only for all times and periods... Which would of course not be practical.

Additionally to this "common" usage principles in the railway sector, there are some "local", not world-wide common usage principles. But they may be of such importance in their part of the world that possibly railML cannot ignore them.

Is it agreed that distances of railway lines in railML must be measured in metrical units? There are parts of the world where they are commonly measured in miles(decimal) or miles+chains. It may not always be practical to convert them into metrical units and back because of the rounding error.

I could imagine, for instance, that any location spot (element) along a railway line could have, additionally to its obligatory relative position in metrical units, a "nominal" position in other units, to avoid backwards conversion.

The same applies to speeds (mph instead of kph), heights (metres or feet) and radii of curves (metres or chains (UK) or "Degree of curvature" (US)).

Does anybody have seen a speed sign of 96.6 kph in UK? ;-) I don't think so. Wouldn't it be good for railML to know whether the sign is actually labelled as "97" or "60"? I think it would be even necessary for some use cases.

Best regards,

Dirk.