Subject: Re: More detailed 'speed change' definitions
Posted by Susanne Wunsch railML on Fri, 29 Jun 2012 08:40:41 GMT
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Hello Carsten, Christian, Dirk and all interested

I tried to conclude the discussion in this and some neighbouring threads
updating the Trac ticket #41. [1] For ease of following I copied the
content herein.

Please check the new proposal for your needs and give us appropriate
feedback. (We are also pleased for positive feedback like "All is fine
for us" ;-)

Some "open points" left, please take a look at this section at the end
of this posting.

--- Trac ticket #41 comment #4 ---------------------------------------

I want to conclude the current discussion of multiple forum threads:
 http://www.railml.org/forum/ro/index.php?group=1&id=89
http://www.railml.org/forum/ro/index.php?group=1&id=120
http://www.railml.org/forum/ro/index.php?group=1&id=121
 http://www.railml.org/forum/ro/index.php?group=1&id=122

```
<infrastructure>
  <infraAttrGroups>...
  <tracks>
    <track id="t1">
      <trackTopology>
        <trackBegin ...
 <trackEnd ...
      </trackTopology>
      <trackElements>
        <speedChanges>
  <speedChange id="sc1" pos="0" vMax="100"  dir="up"
   profileRef="sp1" trainRelation="endOfTrain"/>
  <speedChange id="sc2" pos="0" vMax="60"  dir="up"
   profileRef="sp2" trainRelation="headOfTrain"/>
  <speedChange id="sc3" pos="0" vMax="40"  dir="up"
   profileRef="sp4" trainRelation="headOfTrain"/>
  <speedChange id="sc4" pos="0" vMax="120"  dir="up"
   profileRef="sp6" trainRelation="endOfTrain"/>
      <speedChange id="sc5" pos="1234.5" vMax="80" dir="up"
   profileRef="sp1" trainRelation="headOfTrain"/>
  <speedChange id="sc6" pos="234.5" vMax="60" dir="up"
   profileRef="sp3" trainRelation="headOfTrain"
        signalised="true"/>
```

```xml
      <speed Change id="sc7" pos="256.7" vMax="end" dir="up"
        profileRef="sp3" trainRelation="endOfTrain"/>
    </speedChanges>
        </trackElements>
      </track>
    </tracks>
    <trackGroups>...
    <operationControlPoints>
      <ocp id="o1"/>
      <ocp id="o2"/>
      <ocp id="o3"/>
    </operationControlPoints>
    <controllers>...
    <speedProfiles>
      <speedProfile id="sp1" code="A12" name="Basis" influence="increasing"
        description="Speed profile as general basis for other overlaying profiles"/>
      <speedProfile id="sp2" code="B3" name="Heavy Freight" influence="decreasing"
        description="Speed profile for heavy freight trains"
        axleLoad="40"/>
      <speedProfile id="sp3" code="C1" name="Bridge" influence="increasing"
       description="Speed profile for typical bridges"
       meterLoad="8"/>
      <speedProfile id="sp4" code="T" name="Temporary" influence="decreasing"
        description="Temporary speed profile due to maintenance work"
        operatingPeriodRef="op_1"/>
      <speedProfile id="sp5" code="T5" name="Tilting" influence="increasing"
        description="Speed profile for tilting trains">
        <tilting maxTiltingAngle="8" actuation="active" tiltingSpeed="1"/>
      </speedProfile>
      <speedProfile id="sp6" code="HS" name="LZB" influence="increasing"
        description="Speed profile for trains with activated LZB train protection system"
        nationalSystem="LZB"/>
      <speedProfile id="sp7" code="R" name="Route" influence="decreasing"
        description="Speed profile for trains on a certain route">
        <route>
         <ocpRef ref="o1"/>
    <ocpRef ref="o3"/>
        </route>
      </speedProfile>
      <speed Profile id="sp8" code="B" name="Breaking" influence="decreasing"
        description="Speed profile for trains with certain brake capabilities"
        minimumBrakePercentage="123"/>
    </speedProfiles>
  </infrastructure>
  <timetable>
    <operatingPeriods>
      <operatingPeriod id="op_1" name="Maintenance window"
        startDate="2012-03-01" endDate="2012-03-02">
```

```
        <specialService type="include" startTime="23:05:00Z" endTime="04:15:00Z"/>
        <specialService type="exclude" startTime="02:30:00Z" endTime="03:00:00Z"
          singleDate="2012-03-02"/>
      </operatingPeriod>
    </operatingPeriods>
    <trainParts>
      <trainPart id="tp1" name="Passenger train with tilting system">
        <ocpsTT>
          <ocpTT ocpRef="o2">
    <sectionTT>
      <trackRef ref="t1">
        <speedRef ref="sp1"/>
            <speedRef ref="sp3"/>
            <speedRef ref="sp5"/>
        <speedRef ref="sp7"/>
            </trackRef>
          </sectionTT>
          </ocpTT>
        </ocpsTT>
      </trainPart>
      <trainPart id="tp2" name="Freight train">
        <ocpsTT>
          <ocpTT ocpRef="o2">
           <sectionTT>
             <trackRef ref="t1">
              <speedRef ref="sp1"/>
              <speedRef ref="sp2"/>
        <speedRef ref="sp3"/>
        <speedRef ref="sp4"/>
            </trackRef>
          </sectionTT>
      </ocpTT>
        </ocpsTT>
      </trainPart>
    </trainParts>
</timetable>
```

Documentation of changes

* speedChange element

** The profileRef attribute is of the railML type tGenericRef with an
   additional xs:key-binding. It can be made required with next major
   release only.

** The trainRelation attribute provides one of the enumeration values
   headOfTrain, midOfTrain and endOfTrain. It can be made required with
   next major release only. Mostly the endOfTrain value is used for

increasing speed aspects and the headOfTrain value for decreasing speed aspects. In some special cases, e.g. level crossings in Germany, headOfTrain would be also used for increasing speed aspects.

** The vMax attribute provides an additional enumeration value for indicating the end of a local speed restriction, e.g. on a bridge.

** The dir attribute allows only for the enumeration values up and down. The current value both is marked deprecated. They will be renamed in next major release.

** The signalised attribute indicates whether the speed aspects is shown next to text with some light signal or a panel (true) or only in the "drivers timetable" (false).

* speedProfile element

** The code attribute in <speedProfile> element should be used for the companies' internal "abbreviation" in software tools or printed lists.

** If additional (official) codes for identifying a speed profile are needed, please request this. It is currently not foreseen.

** There is no direction attribute in the speed profile.

** The influence attribute allows for overlaying speed profiles. It is defined as enumeration list of increasing and decreasing. It should be required.

** The axleLoad attribute is of the railML type tWeightTons.

** The meterLoad atribute is of the railML type tMeterloadTonsPerMeter.

** If temporary speed restriction will be used the <operatingPeriods> element of the Timetable sub-schema must be applied.

** The maxTiltingAngle attribute is of the railML type tAngleDegQuadrant (0..90°). It is reused from the Rollingstock sub-schema type tTilting.

** The tiltingSpeed attribute is of the railML type tSpeedDegreesPerSecond. It is reused from the Rollingstock sub-schema type tTilting.

** The actuation attribute is of the railML type tTiltingActuationType allowing the enumeration values passive, active, none and rollCompensation. It is reused from the Rollingstock sub-schema type

tTilting.

** The nationalSystem attribute is of the railML type tNationalSystemsType. It is provided as "railway base type" for all sub-schemas and provides an extensible enumeration list of train protection system identifications.

** The route element is for indicating a train run between neighbouring "ocp"s no matter which direction it goes.

** The minimumBrakePercentage attribute is of the railML type tBrakePercentage allowing any integer value between 6 and 225.

* speedRef element

** All referred speed profiles are taken into account along the referred track. For getting the resulting speed profile for a certain train the software should calculate according to the following algorithm:

** The track is "virtually" divided into sections with no speed aspect changes looking at each speedChange element of the referred speedProfiles.
1. For each "virtual" track section the most increasing speed aspect has to be found across all referred speedProfiles according to the running direction of the trackRef element.
2. For each "virtual" track section the most decreasing speed aspect has to be found across all referred speedProfiles according to the running direction of the trackRef element. If no decreasing value is found, the most increasing value from the prior step will be acquired.

Open Points

** What to do with the current trainCategory attribute?

** Marking as "deprecated" is an easy way, but there are nevertheless international train categories for lines, e.g. "NC_Train" of the ETCS domain [1].

** What to do with the current status attribute?

** How to define the "blocking of a track"?

** Using a time restricted speed profile with vMax="0" in the speedChange elements?

** How to define an "obligational stop" where all or only certain trains have to stop prior going on with the same speed aspect as before?

** Could this be an attribute of the speedChange element?

** Do we need the midOfTrain value as trainRelation in the speedChange
   context?

** The relevance for timetabling (middle of a platform at a station) is
   not the question here, but the relevance for infrastructure-based speed
   aspects.

So, what else? ;-)

[1] ETCS Variables v1.2.pdf

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Kind regards...
Susanne

[1] https://trac.assembla.com/railML/ticket/41#comment:4

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Susanne Wunsch
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