Subject: speed profiles and braking percentages
Posted by on Thu, 26 Apr 2012 18:46:43 GMT
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Hello to all,

Susanne wrote:
> [minimum percentage of brake power]
>
> At some railway infrastructure companies the minimum percentage of
> brake power can't be directly calculated by means of physics. It is
> somehow defined by some legal body.
>
> Therefore we would suggest an additional attribute
> "minimumBrakePercentage" for this value in the <speedProfile> element.

Sorry: It _can_ always be "directly calculated by means of physics" but it is not done so because of arbitrariness... ;-)

Anyway, I know that there are such rules but it is not so easy at least from a theoretical point of view.

There is a strong physical relation between
- the braking distance of a train,
- the braking power of the train (brake percentage, deceleration - anyway in which unit),
- the gradient of the line at the braking distance,
- the current speed of the train.

By setting a "minimumBrakePercentage" to a <speedProfile> you skip the other two of the above named values.
Therefore, this implies the assumptions
- of the (maximum) braking distance being constant for all the route of the speed profile (which may be acceptable in many cases),
- of the gradient being constant for all the route of the speed profile
???

At least the last one is improbable and possibly a little bit too rough.
You may have a ruling gradient at a line but surely not a constant one.

This would mean that a train running a short section only (e. g. between two stations) of a speed profile does need the brake percentage of the steepest section of all the line even if it does not pass that steepest section?

A more proper solution would be:
There is a "minimumBrakePercentage" for each section of a speed profile between two places where trains can start or end (i. e. between two

stations).

However, I am aware that there are such "rough" rules in practice but I think that this is "not the complete truth". There are also rules which apply additionally to avoid that a train needs to run unnecessarily slow. May be these additional rules are not obvious or not shown in the fist place. To avoid mistakes which we can hardly correct only I would recommend to think about "sectional minimum brake percentage" rather than one for all the speed profile (which would lead to many many short speed profiles).

At least, for completeness: If we add a "minimumBrakePercentage" to <speedProfile> we also have to provide them with a brake type and a brake switch position (rail:tAirBrakeApplicationPosition). The same brake percentage can mean totally different braking power depending on the brake position (G or P,...).

Best regards,
Dirk.