2   CLARIFICATIONS ON THE RINF

2.1   Foreword

The implementation of the register of infrastructure requires:

- A common knowledge and understanding of the concepts to be used for the description of each concerned network,

- A shared set of parameters related to all the fundamental features of the railway networks. The specification of parameters allows them to be made available through the RINF application.

It can be carried out by successive steps depending on the strategy adopted by each Member State that has to be notified to the Commission. In addition, by providing its data in stages, each infrastructure manager (IM) can increase the content and the level of description of a given network. After each update of data describing its network by a NRE, the RINF application publishes the complete set of data received from MS. Partial updates are not possible. Whenever a Member State wants to update / improve the description of its network, it must upload to the RINF application a complete set of data which will replace the previous one.

2.2   Scope of the RINF

2.2.1   Geographical scope

The geographical scope for RINF corresponds to the scope of the Interoperability directive (Directive (EU) 2016/797) as implemented by each Member State.

In this context, Member States may have excluded "privately owned railway infrastructure, including sidings, used by its owner or by an operator for the purpose of their respective freight activities or for the transport of persons for non-commercial purposes, and vehicles used exclusively on such infrastructure; (art 1.4.a). See annex 1 of the IOD

2.2.2   The technical scope

RINF 'specifications concern data about the following structural subsystems of the Union rail system:
      (a)   the infrastructure subsystem,
      (b)   the energy subsystem,
      (c)   the trackside control-command and signalling subsystem.

2.2.3   Purpose

The type of data describing the infrastructure is the functional purpose of the RINF as defined in art 2.2 of the Annex of the RINF Regulation.

a)   The value of the parameters to be used to check the technical compatibility between vehicle and route are corresponding to "design" values. These values need to be up to date to allow a RU to:

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- Develop technical specifications for vehicle design; for new vehicles;

- Identifying the vehicles compatible with the planned route/path and its operational conditions;

- Provide relevant data to identify infrastructure characteristics of the intended area of use and facilitate the design of rolling stock and the feasibility check of train services.

b) The type of data intended to facilitate the verification of the technical compatibility between a fixed subsystem and the network into which it is incorporated and to monitor the progress of interoperability of railway fixed installations.

These values need to be up to date to allow a RU to plan the train composition and to perform the route compatibility check on the attributed route/path in the weeks before starting the service operation.

2.3   Description of features of the RINF

The main features supporting the RINF model are described in the RINF regulation [36]. Their definitions are reproduced below:

(a) An 'operational point' (OP) means any location for train service operations, where train services may begin and end or change route, and where passenger or freight services may be provided; 'operational point' means also any location at boundaries between Member States or infrastructure managers;

(b) 'Section of line' (SoL) means the part of line between adjacent operational points and may consist of several tracks;

(c) 'Running track' means any track used for train service movements; passing loops and meeting loops on plain line or track connections only required for train operation are not published;

(d) 'Siding' means any track within an operational point, which is not used for operational routing of a train.

(e) 'Location point' (LP) is a specific point on a track of a SoL (not permitted for OP) where value of a parameter changes. The use of LP is non mandatory.

2.3.1   Levels of the network description

The railway network is presented for RINF purpose as a number of operational points (OPs) connected with sections of line (SoLs). A line can be described in different levels of details. Fig. 1 below shows several ways of representation from a detailed to a simple one. A National Registration Entity can choose what level to populate from simple to detailed level. The visual tool of the RINF application only presents OPs and SoLs of a line updated by an NRE. There is no link, except the number of OP and SoL, between the initial description of a line by NRE and the final representation allowed by RINF application where the successive levels of zoom are organised according to categories of lines and do not provide supplementary details regarding the description of a lines and its elements.

Within OP there are two types of tracks: running tracks and sidings (see explanations about differences in the following sections).

Installations located along the tracks are attached to the tracks. Parameters related to subsystems INF, ENE, CCS within a SoL or related to subsystem INF within an OP are provided for each "track" element of the SoL or OP ("running track" and/or "siding"). Data provided for each parameter are valid for the whole element described:

- from the start OP to the end OP of a SoL for a "running track"; except if "location point" is used;
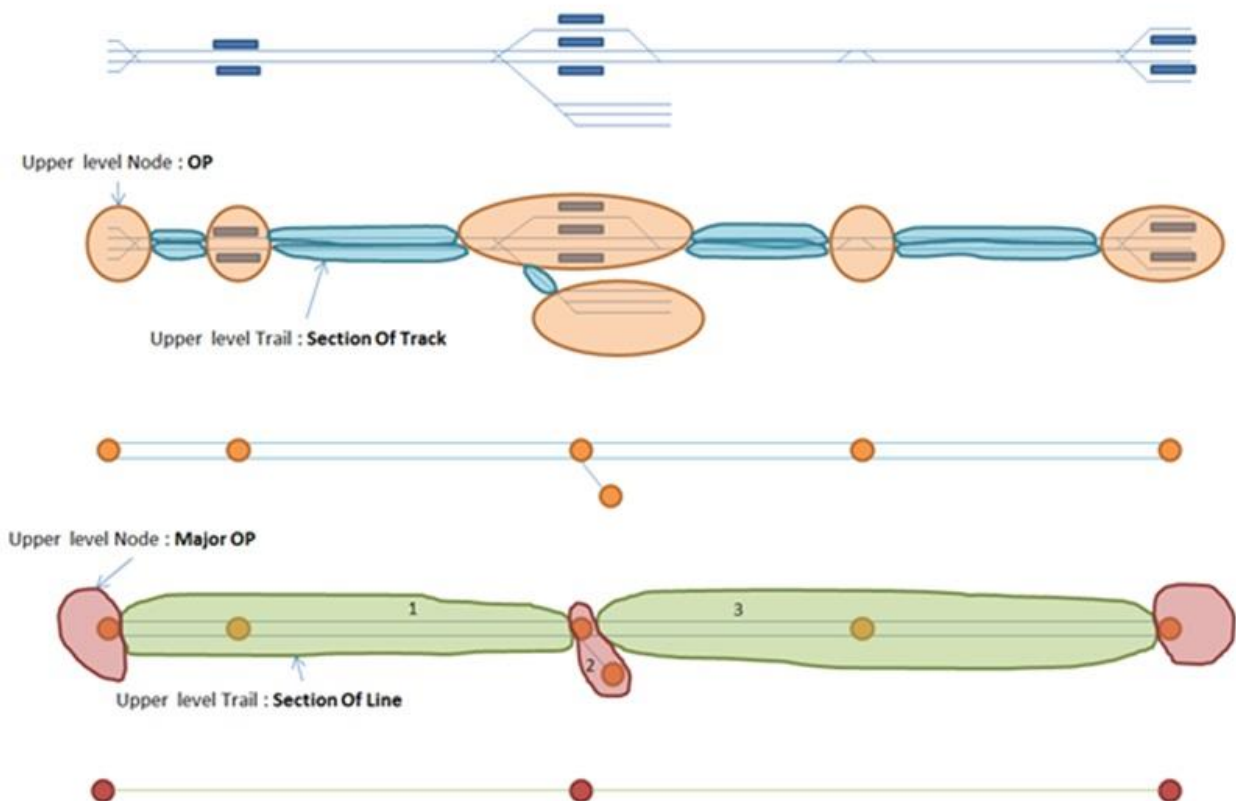
- - inside the OP for a "siding".

Fig. 1 – Levels of description of the network (adapted from UIC RailTopoModel Railway Network Description)

2.3.2 The Operational Point

Operational Point is understood as a point without dimensions, attributed with generic parameters and with objects described by their own parameters. OP is the primary element of the network and selection of OPs is the first task for IMs in procedure of presenting its network. The OP is independent from the notion of line. An OP is not described by belonging to one or several lines. Only SoLs are linked to lines.

An OP will be presented by so called 'centre point' on a global map. This centre point is defined by relevant IM (note that it is not always in the centre of the OP area) and determines the

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geographical coordinates (and the kilometre from the start of the railway line) of OP to be inserted to generic data about location of the OP.

An OP is allowed to have no track (e.g., border points, technical change or OP private siding).

For the purpose of the RINF, the following types of OPs have been defined:

1. Station – big or huge station with several functions, important for international traffic, basic for national railway system;

2. Small station – multifunctional station not so big and not so important like "Station";

3. Passenger terminal – station with dominating function of service for passenger traffic;

4. Freight terminal – station dominantly serving for loading and unloading of freight trains;

5. Depot or workshop – group of tracks used by depot or workshop for RST maintenance;

6. Train technical services – group of tracks for servicing trains (parking, washing, etc.);

7. Passenger stop – small OP consisting of at least one platform, normally serving mostly for local passenger services;

8. Junction – OP consisting of at least one turnout, normally used mostly for changing direction of trains, with reduced or not existing other functions;

9. Border point – located in the point where a border between MSs meets a railway line;

10. Shunting yard – group of tracks used for shunting trains, mostly related to freight traffic;

11. Technical change - to describe a change on CCS or a type of contact line or a Gauge changeover facility – fixed installation allowing a train to travel across a break of gauge where two railway networks with different track gauges meet;

12. Switch - OP consisting of only one switch. It describes a single switch without any extension contrary to a junction that has a real spatial extension and is generally delimited by entry signals;

13. Private siding - OP that describes the embranchment located on the main line that leads to the private siding with the information regarding the embranchment characteristics;

14. Domestic border point – located exactly in the point where a border between IMs meets a railway line.

Principles:

A) - For the implementation of the RINF Decision, RINF was populated on the principles below:

There is no obligation to include in RINF all currently existing traffic points of the network.

There are no detailed rules for selecting OPs for RINF. **An OP must be defined on a network each time a choice in matter of route can be made.**

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Only points or stations which are important for the traffic, stopping and starting trains, or delivering services related to trains and their clients must be identified as OP.

It is permissible to ignore some intermediate stops located on the SoL if they are not important from an operational or technical point of view.

B) - For the implementation of the RINF Regulation and the needs of the IV Railway Package, RINF should display every point allowing to describe a route corresponding to a service operated by a RU. Moreover, as defined by RINF Regulation " 'operational point'(OP) means any location for train service operations, where train services may begin and end or change route and where passenger or freight services may be provided; it includes locations at boundaries between Member States or infrastructure managers;".

In parallel, the implementation of the TAF/TAP TSIs has promoted the definition of Primary Location Codes (PLC) whose ID is a parameter of the OP.

As a conclusion,

Regarding OP type n°11 ("Technical change")

Changes of value of parameters may require defining an OP (type n°11). It allows in particular to describe the implementation of ETCS using parameter 1.1.1.3.2. It allows also to describe a Gauge changeover facility – fixed installation. At last, "type 11" OP allows finally to describe a technical change in energy subsystem, but this solution should be used as little as possible. It should be noted that:
- the RINF already allows describing several types of contact line systems and several energy power systems on a given element of a SoL by repeating the data;
- the use of the Location points makes possible to precise specific points where technical changes are made.

Regarding OP type n° 9 ("Border point")

For these OP between two MS, bilateral agreements have to be achieved concerning name, location of them and other attributes to be included in the registers. The list of borders points is agreed between NREs and managed by the Agency. The list is in 5.2.

Regarding OP type n° 14 ("Domestic border point")

Located exactly in the point where a border between IMs meets a railway line. Their OP ID and other attributes is managed by each NRE and published by the Agency in 5.2. This list will become necessary when IMs will be allowed to directly import their data in the RINF application.

It is necessary to use the correct OP ID to ensure the continuity of the network.

Specific problems may be met in case of large stations or nodes. Then IM may divide such station into several OPs with different types.

It could be useful to take in account of the existence of "PrimaryLocation Codes" already defined for the use of the TAP/TAF TSIs before defining OP for the RINF needs.

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It is mandatory to select OP "Border point". For these OP between two MS, bilateral agreements have to be achieved concerning name, location of them and other attributes to be included in the registers. The list of borders points managed by the Agency and agreed between NREs is in 4.2.

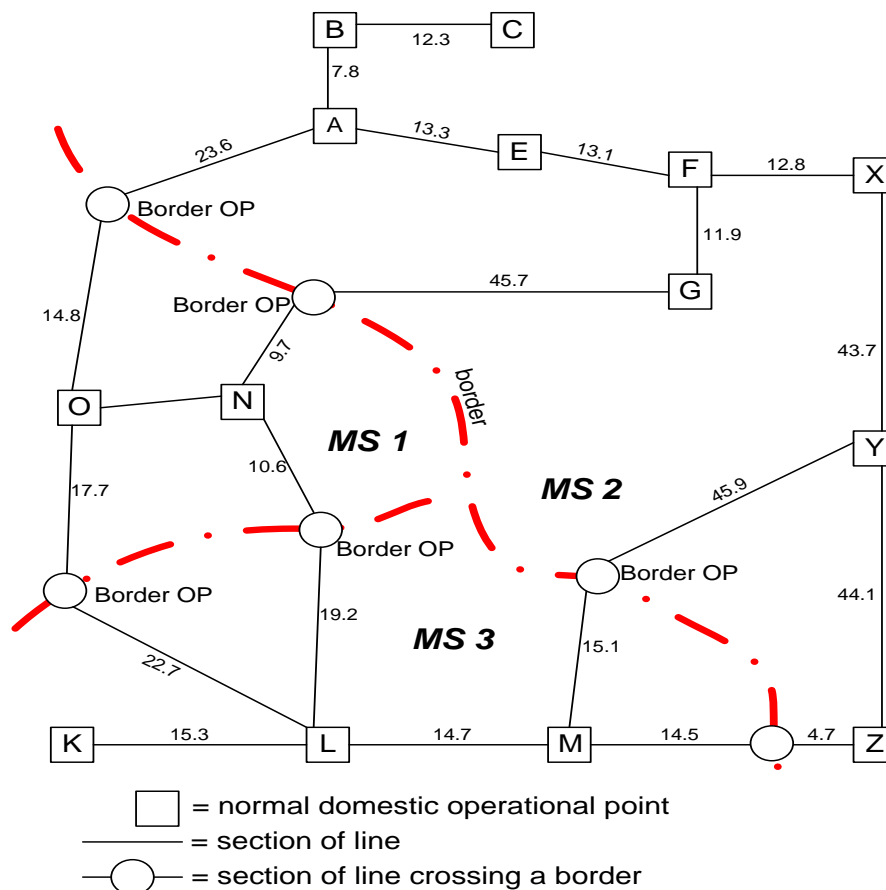Fig 2. Below provides an example of Border points between three MS.

Fig. 2 – International macro railway network with SoL lengths (D. KES)

The same type of agreements will have to be achieved at national level in order to determinate the border points between several IMs and to be able to merge several datasets in a single national one. This task shall be carried out at national level by the NRE.

2.3.3 The Section of line

A section of line is the connection between two adjacent OPs. Section of Line is the second basic element of RINF.A line is a continuous chain of sections of lines and operational points when except beginning and end of a line, the OP at end of a SoL is the OP at start of consecutive SoL.

A single SoL may be settled to be a line at its own. As each SoL is described separately, number of tracks and values of related parameters may be different on different SoL of the same line.

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It is important to underline that in one SoL may be included tracks only of the same line. When two different lines are running in parallel – passing by the same OPs - data on tracks of each line has to be published in two separate SoLs.

For proper presentation of the network and for avoiding uncertainties in routes and lines, data about OPs on the respective ends of SoLs must be entered carefully.

SoL which is a single track connecting two OPs within a big node (when this big node has been divided into several OPs) has a reduced set of parameters. Such track is indicated as 'Link' in parameter 1.1.0.0.0.6 'Nature of Section of Line'. Only the group 1.1.0.0.0 'Generic information' must be completed.
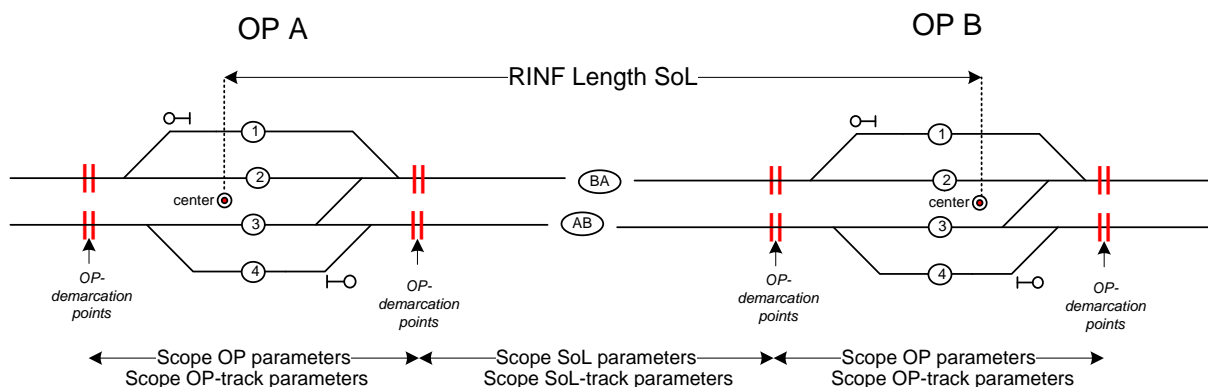

Fig. 3 – Section of Line (SoL) between two Operational Points (OP) (provided by D. KES)

2.3.4   Elements of an operational point

Elements inside an OP are 'Running tracks' and 'Sidings'. 'Running tracks' in OP are regarded all those tracks which are used for operation of trains in service movements. It means that not only main tracks of a station are 'Running tracks' according to RINF, but also all additional tracks where passenger trains stop at platforms or where freight trains over-pass group of tracks with platforms.

'Siding' is regarded as a single/simple track. Sidings are all those tracks where running trains in service movements ends and which are not used for operational routing of a train. According to RINF, 'Siding' is any track which "delivers support" for the traffic, but which is not a route for the traffic.

It is possible as a first step to describe existing sidings / platforms of an OP in only one "type siding" / "type platform" adopting the most restrictive characteristics and to introduce siding without any track.

In an OP, only few parameters related to infrastructure subsystem are included. **For the other parameters related to infrastructure subsystem energy and command control and signalling subsystems, it is assumed that, in an OP, the same parameter regarding CCS and ENE are corresponding to those of neighbouring SoLs (permitting at least to enter to the center of OP). The exception is the OP used for describing a technical change on type of contact line or CCS.**

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The specific for OP description is the group of parameters related to platforms. Platform for the purpose of RINF is understood as a platform edge. Platform identification shall concern only the part of the structure neighbouring to the track (interfaced with trains).

In case when normal platform numbering concerns the whole structure between two tracks, the 'RINF platform' may be labelled using the platform number and the track ID to which the specific edge belongs.

It is worth adding that platform is the installation for providing passengers' access to trains – this is not the construction for loading or unloading freight trains.

It is very important for RINF to have a unique identification for each OP (OP ID). OP ID is the code composed from country code and alphanumeric OP code developed by MS or IM. We suggest using those number or abbreviations which are applied in route books or in documentation of the IM. In case of absence of such sources the coding system within the MS may be developed specially for RINF.

Finally, one or several "PLC" can exist in the OP area. The corresponding primary location codes shall be provided using the relevant parameter (1.2.0.0.0.3).

Private siding: There is no more reference to private siding in RINF Regulation. Any siding in the scope of the implementation of the Interoperability Directive done by a Member State should be described, whatever is the owner, the owner being described by its "IM code". If the owner has no "RICS Company code", an organisation code will be assigned upon a request by the Agency (see Organisation Code Register on ERA Website).
Some IMs could have chosen not to describe the siding itself but the location of it on its network where a switch leads to a private installation. The definition of the OP private siding was modified allowing to describe so.

As any siding, the following parameters have at least to be filled:
1.2   OPERATIONAL POINT

1.2.0.0.0   Generic information
1.2.0.0.0.1   OPName / Name of Operational point
1.2.0.0.0.2   UniqueOPID /Unique OP ID
1.2.0.0.0.3   OPTafTapCode / OP TAF TAP primary location code
1.2.0.0.0.4   OPType / Type of Operational Point
1.2.0.0.0.5   OPGeographicLocation / Geographical location of Operational Point
1.2.0.0.0.6   OPRailwayLocation / Railway location of Operational point

1.2.2   OPSiding / SIDING
1.2.2.0.0 Generic information
1.2.2.0.0.1   IM's Code / IM's Code
1.2.2.0.0.2   OPSidingIdentification / Identification of siding
(INF)
1.2.2.0.2   IPP / Performance parameter
1.2.2.0.2.1   IPP_Length / Usable length of siding
1.2.2.0.3 Line layout
1.2.2.0.3.1   ILL_Gradient / Gradient for stabling tracks
1.2.2.0.3.2   ILL_MinRadHorzCurve / Minimum radius of horizontal curve

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1.2.2.0.3.3   ILL_MinRadVertCurve / Minimum radius of vertical curve

2.3.5   Elements of a section of line

Section of Line consists of one or more tracks of a same national line starting from OP at start of this SoL and ending in the OP at the end of the same SoL.

Values of parameters displayed for a SoL are guaranteed along the corresponding track outside OPs and at least for one or more running tracks inside the area of the start OP and of the end OP up to their center point.

It is advised to organise introduction of data to registers in the way which permits placing the same value of a parameter into all tracks of the same SoL where this is valid.

With regard to the tunnel, the definition foreseen by new SRT TSI [31] is "A railway tunnel is an excavation or a construction around the track provided to allow the railway to pass for example higher land, buildings or water. The length of a tunnel is defined as the length of the fully enclosed section, measured at rail level. A tunnel in the context of this TSI is 0.1km or longer."

'Tunnel' is understood in RINF as the special area of the track with special conditions. So, parameters concerning a tunnel are the attributes of a track; however, those parameters are given in group of parameters titled 'Tunnel'. If there are several tracks in the same tunnel, data related to this tunnel will be repeated in description of each track. On the other hand, if a track passes through several tunnels, in the description of the track will be mentioned several groups of parameters titled 'Tunnel' to describe each of the tunnel separately. The similar rules concern tunnels in OPs which may contain both tracks and sidings.

2.3.6   The Location Point

IMs have the possibility to introduce within SoL Location Points to describe specific change in the value of a parameter at running track level (it cannot be used for parameters of SoL level). LP can be used each time several successive values of a parameter are described for a given track in a same SoL. The new value is valid from the specified location in the direction of the principal SoL direction of the traffic (defined by increasing kilometres, see description of parameter 1.1.0.0.0.3 in Table 5).

The following data has to be included in the description of the LP:

-     Km [NNN.NNN] of the line of the point from where the new value is valid

-     Geographical longitude of the point from where the new value is valid

-     Geographical latitude of the point from where the new value is valid

-     The new value of the parameter.

An example of xml is below:

```
-<SOLTrackParameter Value="351" IsApplicable="Y" ID="IPP_MaxSpeed">
<LocationPoint Value="130" Latitude="14.1345" Longitude="-43.9600" Kilometer="12.45"/>
<LocationPoint Value="123" Latitude="14.1366" Longitude="43.9700" Kilometer="13.1"/>
</SOLTrackParameter>
```

The application of LP is optional. When LPs are not used, they will not appear in the XML file exported from a register to RINF application. Even if provided, they will only be displayed in the details of the running track and will not appear in the final representation of the network. The RINF application in its current development will not search in Location Point values.

But any search will display the location point(s) and the specific value each time it exists for a given SoL. The location point is described by its railway location, geographical coordinates and value of the parameter involved.

2.3.7   General information about parameters of RINF

Parameters collected in RINF are mainly:
a)   Generic data – valid for SoL, OP, running track, siding,
b)   Data related to specific subsystems – for INF, ENE and CCS in SoLs; only for INF in OP,
c)   Data for performance parameters, for objects (tunnel, platform) or for providing references of certificates (declarations).

Organisation of parameters in RINF is presented in table 1 of the annex to the EC RINF Regulation.

It is important to underline that it is permitted/foreseen to repeat certain parameters or groups of parameters. For example: if there are several tracks on the Section of Line – then the whole set of parameters for Track has to be repeated for each track in the SoL.

Also, when several data relating to the same parameter co-exist, then this parameter may be repeated. For example, when there are several "EC intermediate statement of verification" (ISV) declarations for a single subsystem concerning the same track, then this parameter may be repeated so many times as many declarations concern this track.

But please be aware, not all parameters may be repeated – the respective information is provided in a specific attribute "Can be repeated" with the value 'Y' (See table 5).

For the purpose of the RINF, the appropriate value of a parameter has to be the most critical from all values met along the whole track of the SoL.

It means, in general, when a parameter has several values in a same SoL and the RINF application does not authorise its repetition, the most restrictive value of the parameter on the specific track is the RINF value for this parameter on this track.

That is why it is very important to make a thorough selection of OPs.

NREs/IMs can adopt an "in stages" approach starting to describe their network with the most restrictive characteristic.

New OPs and SoLs can be added in further stages to increase the level of description of the network.

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Some values of some parameters may not exist – like 'Tunnel identification', 'EC declaration of verification', 'OP TAF/TAP primary location code'. Then the applicability of that parameters will be "N".

In case of multi-rail track, a set of data is to be published separately to each pair of rails to be operated as separate track (the whole set of parameters for the separate track has to be delivered – be careful then with the track identification).

In case of multiple ENE and/or CCS subsystems, the ability to repeat the relevant of parameters allows to describe these particularities of a running track.

The data uploaded to the RINF application should follow metric system principals. For example, in the UK miles or miles per hour will be transformed respectively to kilometres or kilometres per hour prior uploading to the RINF application. The exception are values of speed related to RA (Route Availability) given for Load Capability (1.1.1.1.2.4).

2.3.8   *Objects for separate dating (future validity)*

Date of validity of current data collected in RINF is the same as date of export from the MS' registers of infrastructure to the RINF application.

However, if an IM wants to publish a set of data concerning their future value, the separate validity of those data from the date in future may be given. Then the set of data of the 'object', where those data are included, has to be added to current values by repeating the 'object' with the label of the date of validity in future (see explanations for Common User Interface in 3.1.h). **No overlap in the validity dates shall be accepted by the RINF application** (However, an overlap of three month is currently tolerated by the current RINF application. This possibility will be removed.).

The objects for which this future validity date may be applied are: Operational Point, Section of Line, Track, Siding, Tunnel and Platform. **These dates are not described as attributes of parameters but have to be inserted in the RINF XML**.

2.4   Characteristics of RINF parameters

RINF parameters are listed in table 5. Each presentation of a parameter provides clarification on the requirements, data presentation, when relevant list of possible answers, information on applicability and mandatory status, ability to be repeated and the XML name of the parameter that will be used in the XML file for uploading RINF data in the RINF application.

The XML name of parameters was introduced to replace the numbering identification in order to allow further introduction of new parameters or to delete existing ones. It also provides a better readability of the XML file.
Table 5 is the basis of the validation process used by the RINF application. This process is described in the "RINF XML Data Validation Guide" [25].

An optional attribute was also introduced in the XML for some parameters. It is described in 1.1 of RINF XML Data Validation Guide.
This element is the "optional value". This optional attribute is used only for readability of the XML file. When several answers are proposed in table 5 for providing the value of a parameter, these values will be introduced encoded and supported by an "optional value" attribute where the value

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