TCR Webtool V3.0
Manual

Version 0.1 – 30.06.2020

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Contents

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Introduction

The User Manual contains all essential information for the user to make full use of the RNE TCR webtool 3.0 system. This manual includes a description of the system functions and capabilities, contingencies and alternate modes of operation, and step-by-step procedures for system access and use. Use graphics where possible in this manual.

Purpose and Scope

Temporary Capacity Restrictions (TCRs), an umbrella term in the railway sector for various types of construction works and events which lead to a reduction of infrastructure capacity, are one of the main disrupting factors in timetabling: Even though they ultimately contribute to establishing a sound and stable rail infrastructure, as a short-term and mid-term result numerous trains have to be re-routed, replaced or even cancelled on their account and passengers as well as the freight traffic is confronted with a reduced quality of the transport or even with non-communicated delays. Particularly in an international context, TCRs play a major role as - due to the deployment of various planning systems and a lack of communication - the cross-border traffic is affected even more strongly.

Key factors to decrease the effects of TCRs by simultaneously increasing the quality and stability of international train timetabling are:

- careful planning of TCRs,
- improved coordination of TCR among countries and
- their publication in due time before the timetable changes.

With regards to these key factors the TCR Working Group (TCR WG) of RailNetEurope (RNE), a European association which aims to enhance the quality and the efficiency of the international rail traffic decided to set up a web-based platform which should focus on resolving the negative effects triggered by TCRs. Being the first international application treating TCRs and their consequences this platform should foster the information exchange and the coordination of internationally relevant TCRs as well as the timely publication of TCRs on the European-wide network.

Functionalities and impact of the TCR-tool

The specifications of the web-based TCR-tool cover three fundamental functionalities:

- Firstly, the tool gives a graphical overview of all European-wide planned TCRs on the national and international main axis, for instances by using maps or charts. Within the graphical overview also the consequences of TCRs for traffic will be displayed and certain filters allow a user-related display. It is important to note that the provided graphical overview will not be exclusively available to Infrastructure Managers (IMs) but to Railway Undertakings (RUs) as well to enable them to adapt their traffic concepts following the TCRs and their impacts.
- Secondly, the TCR-tool foster the exchange of crucial information between IMs since it also provides information about TCRs in neighbouring IMs and their impact on traffic. In this regards a notification system is implemented to ensure an up-to-date information base and to continuously inform the users about possible amendments.
- Thirdly, the application shall support the harmonization of TCRs between IMs by installing a feature which requires the approval of an affected IM in case a new TCR is generated or an existing TCR has been modified. Thereby, the affected IM needs to agree on the impact on the capacity available for traffic on the one hand and on times when to develop and offer alternative timetables on the other hand.

Containing these major functionalities the TCR-tool is not only useful for the coordination and publication of TCRs between IMs but will also generate value for RUs as it provides RUs one single platform in which each customer could find harmonized information (in contrast to the

current a situation where a customer has to review different Excel lists of various RFCs to assess the impact of TCRs for his traffic concepts).
Also, for smaller IMs which have no national tool available to plan TCRs the TCR-tool could even be applied to support national purposes.

Although the TCR-tool has to take certain obstacles to success it is already considered to be a great advancement for the railway sector. Being the first internationally used IT-tool to manage, coordinate and communicate TCRs it adds significant value to the timetabling process by decreasing the negative impacts of TCRs for both passenger and freight traffic.

In summary, the TCR-tool considerably contribute to an enhanced quality of timetabling and - together with the TTR programme – completely reshape today's world of planning capacities of the railway.

HELP FACILITIES

In a case that you have some problems working with TCR Tool, you can send the description of the problem (together with the screenshot, if needed) to the next mail address:

support.tcr@rne.eu

The problem will be sent to the RNE incident management system and you will get information that your problem is received. In the incident management system, a ticket with a problem will be created and sent to the first level support.

Glossary

Term	Description
TCR	Planned Temporary Capacity Restriction
RNE	RailNetEurope
TTR	Redesign of the international timetabling process'
RFC	Rail Freight Corridor
.xml	Extensible Markup Language
.xls	Microsoft Excel file format
IM	Infrastructure Manager
RU	Railway Undertaking
IM_User	Infrastructure Manager User
IM_Admin	Infrastructure Manager Administrator
ID	Identification
OU	Organisational Unit
GIS	Geo Information System
TAF/TAP TSI	Telematic Applications Freight/Passenger Technical Specifications for Interoperability
CAD	Computer aided design

1. TCR Tool V3.0 – User Manual

1.1. Login user and TCR cockpit

1.1.1. Logon users

The login functionality verifies that only registered users are able to log in into the TCR tool.

Following actions are necessary to log-in.

#	Action	Expected result
1	Open the login screen of the TCR tool (https://tcr-test.rne.eu)	The login screen is opened.
2	Fill in valid user credentials and click on the “login” button.	The user is logged in and the dashboard is shown.

Figure 1 - Log-in screen

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1.1.2. TCR Tool Cockpit

After successful log-on, the user specific dashboard page within the TCR cockpit shall be opened.

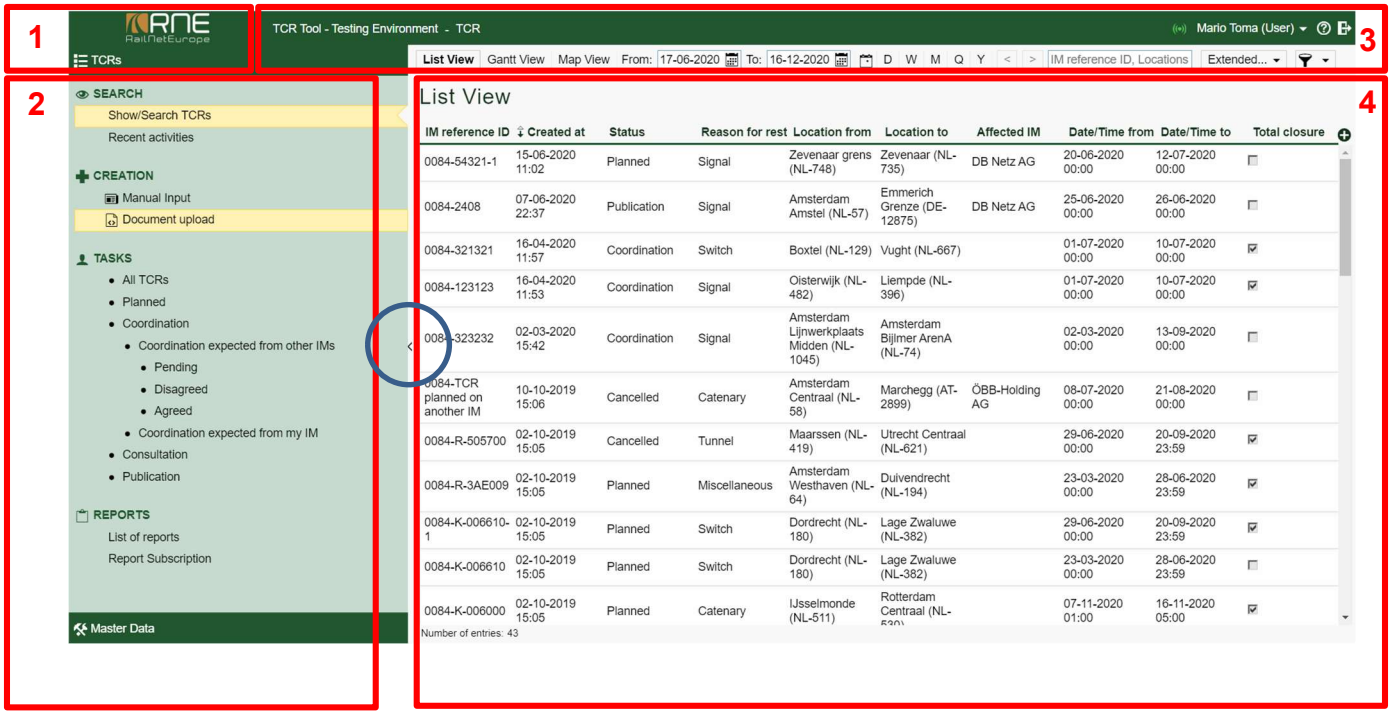


Figure 2 – The TCR Tool cockpit

The cockpit is structured 4 major areas:

1 – Clickable logo

By clicking the RNE logo, the user focus will be returned to the “Show/Search TCRs”, that is starting point after the successful login into the tool

2 – Navigation section

Using the navigation section, users can execute different functionalities of the tool. The navigation section is divided into 2 main areas:

- TCRs – with the functionalities to perform all the necessary actions on the TCRs like searching and filtering TCRs, creating and importing TCRs, changing the statuses and assess the TCRs and execute predefined reports.
- Master Data –all data that are used in the tool are defined in this area. This data is synchronized from the RNE BigData database.

3 – Action buttons and Menu bar section

All actions on working with TCR itself, like save, cancel, bulk edit and so on, are defined in this section.

4 – Content section

All data, as a result of selecting the functionalities from the navigation section or Action buttons and menu bar section, will be shown in this section.

In the circle, a "**<**" button is presented that shall be used to extend the working area of the content section by hiding the navigation section.
After the content section is extended, the "**>**" button, presented on the left side in the middle of the screen, will be used to show the navigation section back.

1.2. Search

The first group of functions is related to the filtering and overview possibilities of the TCR Tool. In this group two functions can be chosen:

- Show/Search TCRs
- Recent activities

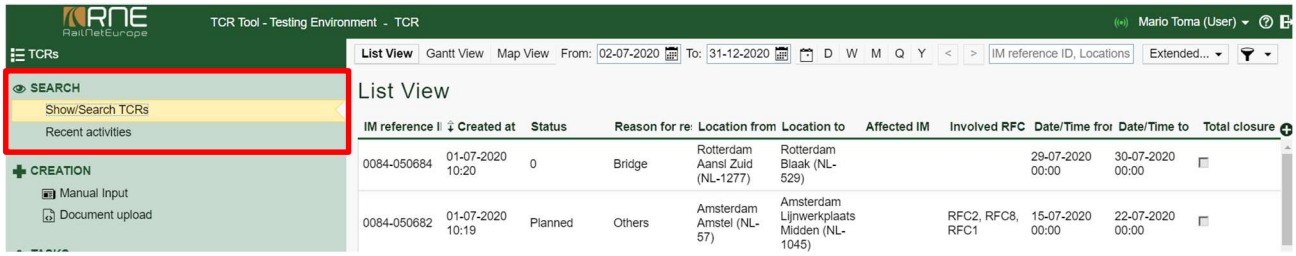


Figure 3 –Search group of functionalities

In general, TCRs can be displayed in two separate ways. Using specific overview types to give the user a comprehensive summary of TCRs and second, a detail view allowing for capturing all relevant TCR data.

For displaying TCR in an overview, the following three different presentation types are provided:

- List view,
- Gantt view
- Map view

All three views have a common search form, that appears by clicking at the "Show/Search TCRs" function and the results of a search are presented in the result pane. This means, changing between these three views, the search results will be the same, even the presentation is different.

The detail view for a TCR can be retrieved out of every overview type. The visibility of TCRs depends on the visibility permission of the user's role (*Administration*).

The "Recent activities" function is used to search the latest activities that were done on TCRs.

1.2.1. Show/Search TCRs

The “Show/Search TCRs” is the first page that is presented after the successful login in the tool. Using this functionality, users can define various filtering options to search for specific TCRs and present them in three different views: List view, Gantt view and Map view.

There are three different filtering options (marked in the image with rectangle objects):

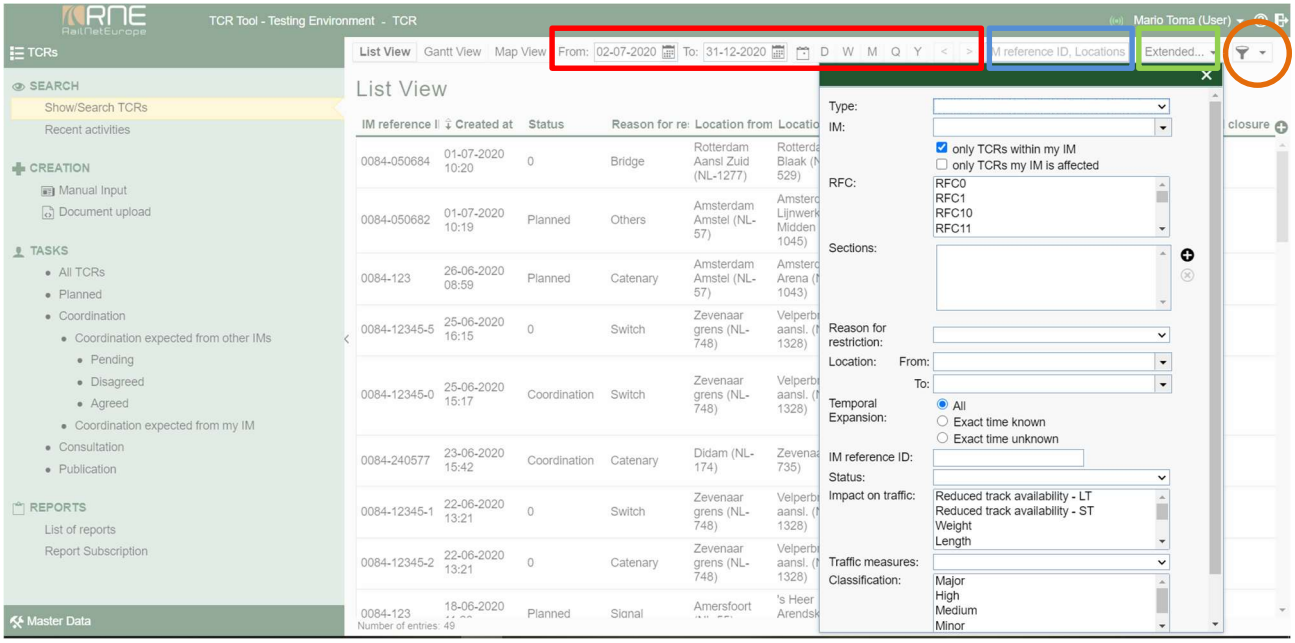


Figure 4 –The search filters

Filtering by date

Date filtering is presented on the top of the page of each view (List, Gantt, Map) and will be used to search the TCRs per specific date or validity period (presented in the red rectangle). Users will use this filter to make the first basic search for the TCRs.

By default, the period of 6 months is selected (starting from the current date). For the fast data entry and search for a specific period, the following “Time” buttons can be used:

- “d” – a one day period
- “w” –a weekly period
- “m” – a monthly period
- “q” – a quarterly period
- “y” – a yearly period
- “<” – a previous period (related to the “from” and “to” values)
- “>” – a previous period (related to the “from” and “to” values)

Click on these buttons, the “from” and “to” values will be changed accordingly, by calculating from the current date (e.g. if the current date is 13th June 2019, clicking at the “d” button the next day – 14th June 2019 will be presented in the “from” and “to” fields, or by clicking at the “w” a period from 13.06.2019-19.06.2019 will be presented, etc).

Two additional buttons are used to select a previous (“<”) or next (“>”) period relative to the selected period. These two buttons are only effective if the period (“from” and “to” values) is

automatically filled by clicking one of the “Time” buttons. In the case of manual change of one of these values, these two buttons will be disabled.

Explanation of the other attributes:

<table>
<tr><th>ID</th><th>Item</th><th>Description</th></tr>
<tr><td>1</td><td>Time</td><td>The following buttons can be used to automatically enter a valid date “from” and “to” for the period to be searched for TCRs:

<table>
<tr><td>  </td><td>Reset the entered values (period) to the default period starting with the current date</td></tr>
<tr><td>D</td><td>A next day of the current date</td></tr>
<tr><td>W</td><td>A weekly period starting with a current date</td></tr>
<tr><td>M</td><td>A monthly period starting with a current date</td></tr>
<tr><td>Q</td><td>A quarterly period starting with a current date</td></tr>
<tr><td>Y</td><td>A yearly period starting with the current date</td></tr>
<tr><td><</td><td>A previous period of the currently selected period in the “from” and “to” fields. The button is available only if the values are set automatically by the buttons above. In any manual modification of the values, the button will be disabled.</td></tr>
<tr><td>></td><td>A next period of the currently selected period in the “from” and “to” fields. The button is available only if the values are set automatically by the buttons above. In any manual modification of the values, the button will be disabled.</td></tr>
</table>

Definition of the search period:

The search period can be fill in automatically using the buttons for setting the values or manually by entering values using the keyboard.
By default, the date period is set to 6 months (starting from the current date) and time is set to 24 hours (a whole day). That means the TCRs for the following 6 months are presented in the result pane.
Each TCR that exists in the required period will be displayed.

  - Button to remove (reset) entered values from the date and time field</td></tr>
</table>

Extended filtering

The extended filtering is used in the combination with the “Filtering by date”, to filter the TCRs by additional parameters. Any combination of these additional parameters is acceptable. That means that the filter parameters defined in the “filter by date” will be used together with these additional parameters defined in the “Extended filter” form.

The extended filtering form is opened by clicking the “Extended…” button (marked in the green rectangle). The search form with additional parameters is presented as shown below:

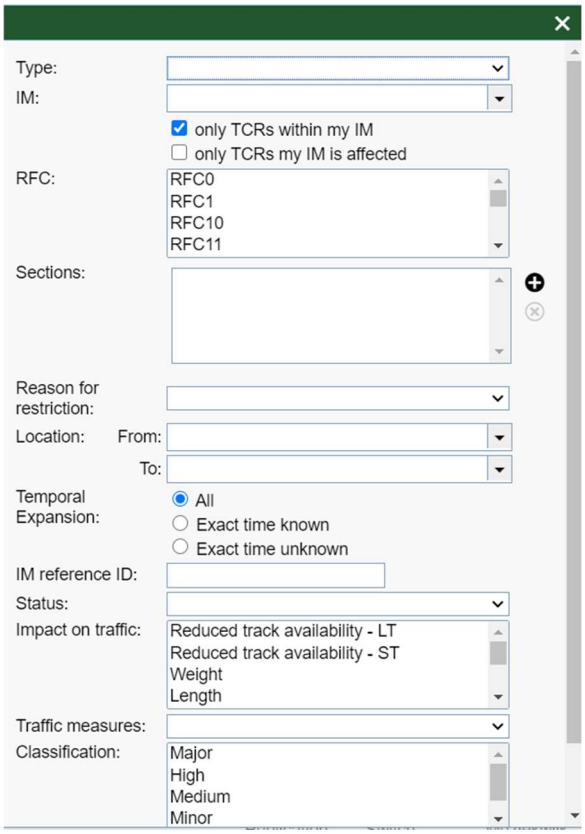
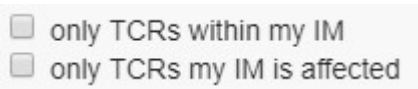


Figure 5 –Extended search parameters

Users can define any combination of the parameters explained in the table as follows:

ID	Item	Description
1	Type	Search TCRs by types: - Continuous - Periodical - Periodical continuous
2	IM	Searching the TCRs that affects a specific IM
3	Visibility	Using the visibility option, it is possible to search for TCRs created by the user's IM or TCRs in which the user's IM is involved. The "only TCRs within my IM" is selected by default. 
4	RFC	The RFCs that are involved or affected by TCRs. It is possible to select more RFC items.
5	Sections	A user can add a section/s, to filter all TCRs that touches the entered sections
6	Reason for restriction	Searching TCRs by the reason for the restriction. The values are: - Signal - Switch - Catenary - Track and Rail - Tunnel - Bridge - Miscellaneous - Maintenance - Other

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<table>
<tr><td>7</td><td>Location:
From
To</td><td>It is possible to search for the TCRs that are created between the selected locations or touches one of the locations.
From and To locations could be selected.</td></tr>
<tr><td>8</td><td>Temporal expansion</td><td>Using the temporary expansion option, it is possible to define what kind of TCRs will be searched in a sense of defined time.

The possible options are:<table><tr><td>All</td><td>All TCRs will be searched, doesn’t matter if the date and time is exactly defined or not</td></tr><tr><td>Exact time known</td><td>Only TCRs with the exactly defined time will be searched and presented</td></tr><tr><td>Exact time unknown</td><td>Only TCRs without the exactly defined time will be searched and presented</td></tr></table>
It is important to highlight that the period that applies to the temporarly expansion is the same that is defined in the “Time” section (date and time defined by fields “from” and “to”).
In the case of unknown exact time TCRs, the date and time that is defined in each TCR are calculated and compared with a period defined in the search section.</td></tr>
<tr><td>9</td><td>IM reference ID</td><td>IM reference ID represent the unique ID of the TCR created in the IMs national system. To search for the specific TCR, a whole ID must be entered.</td></tr>
<tr><td>10</td><td>Status</td><td>Search TCR by one of the status. The values are:
- Planned
- Cancelled
- Coordination
- Consultation
- Publication</td></tr>
<tr><td>11</td><td>Impact on traffic</td><td>Search TCRs by their impact on traffic. One or more items can be selected. The values are:
- Reduced track availability – LT
- Reduced track availability – ST
- Weight
- Length
- Profile
- Total closure
- Speed restriction
- No catenary</td></tr>
<tr><td>12</td><td>Traffic measures</td><td>Search TCRs by one of the traffic measures. The values are:
- Cancellation – Freight trains
- Cancellation – Long distance trains
- Cancellation – Short distance trains
- Re-Routing – Freight trains
- Re-Routing – Long distance trains
- Re-Routing – Short distance trains
- Train/Bus replacement – Freight trains
- Train/Bus replacement – Long distance trains
- Train/Bus replacement – Short distance trains
- Estimated delays – Freight trains
- Estimated delays – Long distance trains
- Estimated delays – Short distance trains</td></tr>
<tr><td>13</td><td>Classification</td><td>Searching TCRs by the classification. The values are:
- Major
- High
- Medium
- Minor
- Unclassified</td></tr>
</table>

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After clicking the “Search” button, the tool starts with searching all the TCRs that satisfied the entered search parameters, including the dates defined in the top of the page.

The “Close” button quits entering the search parameters and closes the search form.

Results filtering

After the filtering from the previous searches finish, the list of the TCRs, that satisfied the entered parameters, is returned. Depends on the number of the TCRs imported in the tool and also, depends on the defined filters, a bigger or a smaller number of records will be returned.

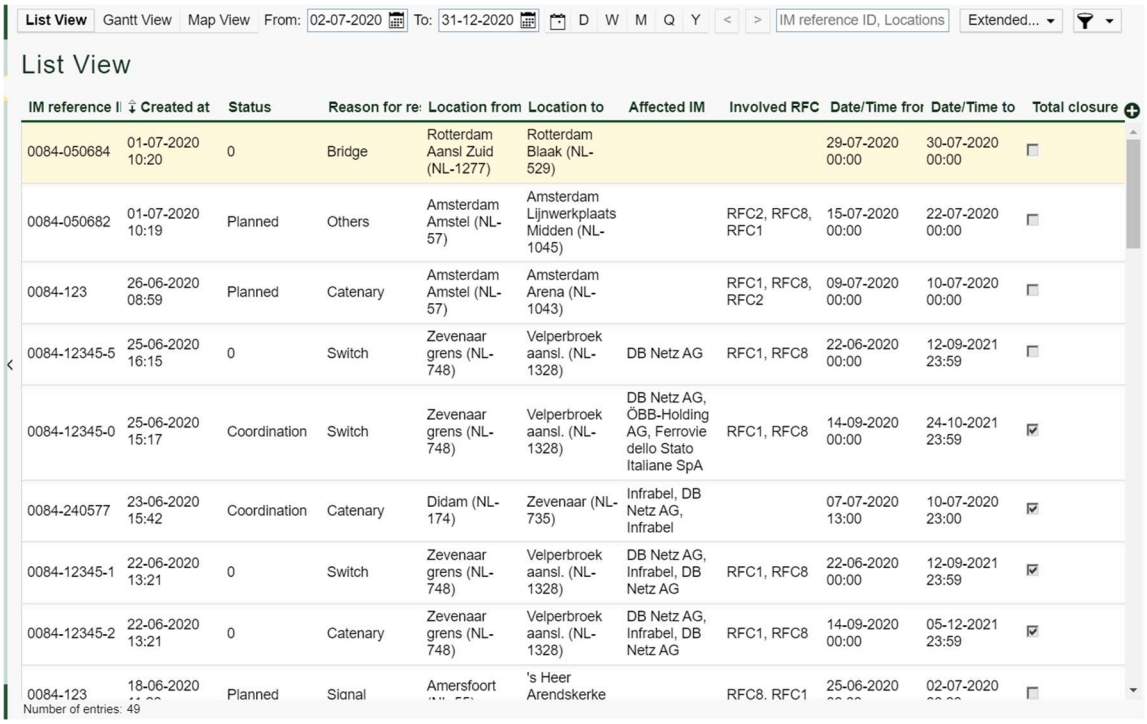
In more cases it is not easy to find (position) on a specific TCRs in the list. To avoid this situation and make it easier to find an individual record, the filter of the results could be used (marked in the blue rectangle).

Using this filter, the results can be filtered by the following parameters:

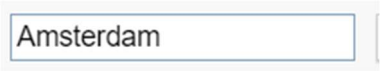
- IM reference ID
- Location from
- Location to

The entered value in this search field should not be the exact. The entered value can contain the part or the whole value of the TCR presented on the screen. Any part of the value of these two parameters could be added to filter the results. All three columns will be searched with the entered value and the result will present the records in which at least one of the column contain the entered value.

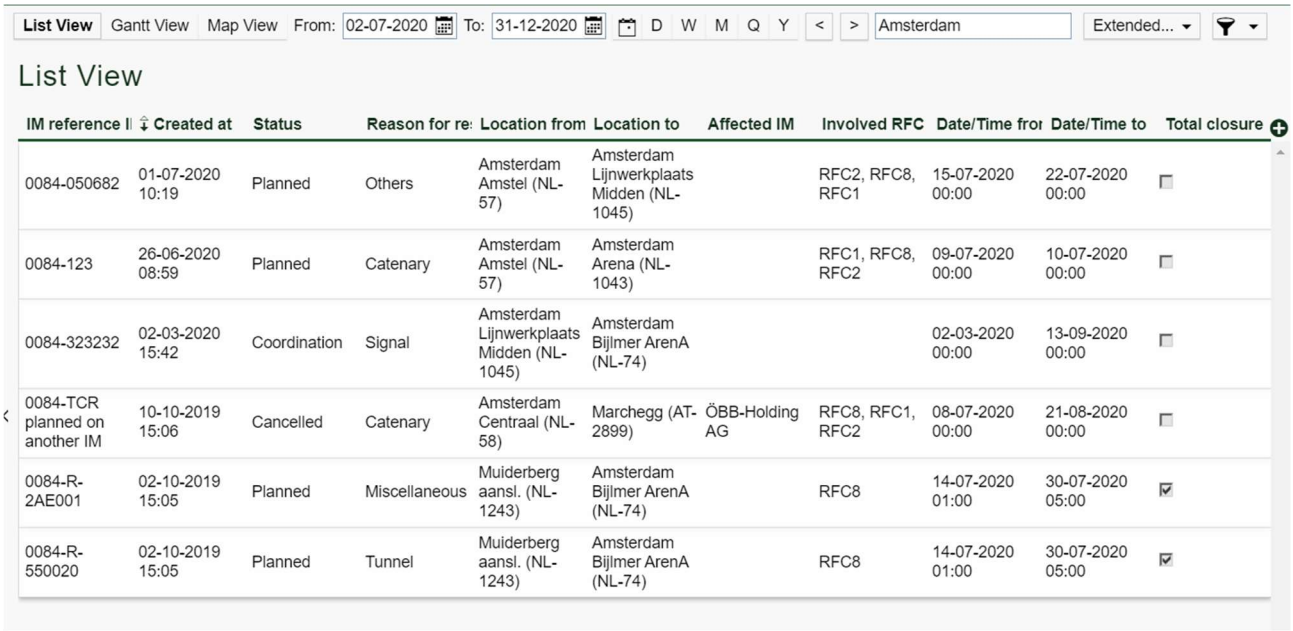
***Example**: In case that our search returned the list of 49 records as presented on the image below:*



Now we would like to find all records which "Location from" is equal to "Amsterdam". In this case in the results filtering field this value should be added. It searches these two columns for the entered value:



After pressing the enter, the presented list of the records will be further reduced, and will present only the records that fulfils this additional filter as well.



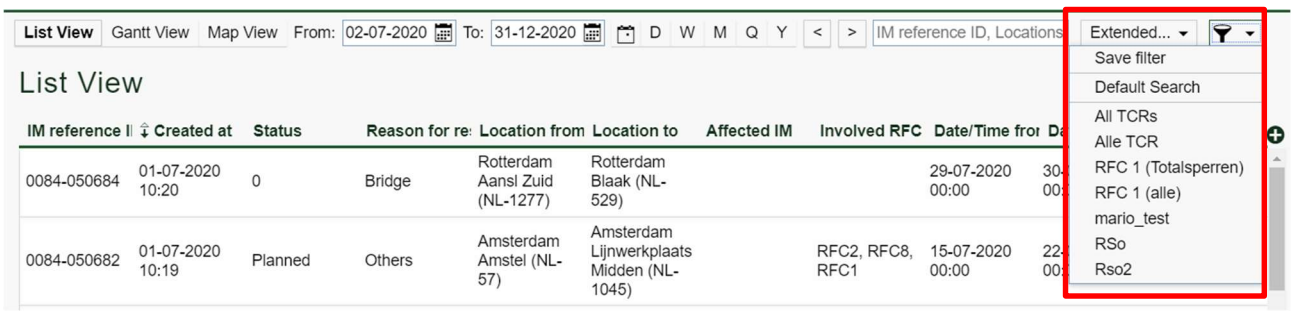
IM reference I	Created at	Status	Reason for re	Location from	Location to	Affected IM	Involved RFC	Date/Time fro	Date/Time to	Total closure
0084-050682	01-07-2020 10:19	Planned	Others	Amsterdam Amstel (NL-57)	Amsterdam Lijnwerkplaats Midden (NL-1045)		RFC2, RFC8, RFC1	15-07-2020 00:00	22-07-2020 00:00	
0084-123	26-06-2020 08:59	Planned	Catenary	Amsterdam Amstel (NL-57)	Amsterdam Arena (NL-1043)		RFC1, RFC8, RFC2	09-07-2020 00:00	10-07-2020 00:00	
0084-323232	02-03-2020 15:42	Coordination	Signal	Amsterdam Lijnwerkplaats Midden (NL-1045)	Amsterdam Bijlmer ArenA (NL-74)			02-03-2020 00:00	13-09-2020 00:00	
0084-TCR planned on another IM	10-10-2019 15:06	Cancelled	Catenary	Amsterdam Centraal (NL-58)	Marchegg (AT-2899)	ÖBB-Holding AG	RFC8, RFC1, RFC2	08-07-2020 00:00	21-08-2020 00:00	
0084-R-2AE001	02-10-2019 15:05	Planned	Miscellaneous	Muiderberg aansl. (NL-1243)	Amsterdam Bijlmer ArenA (NL-74)		RFC8	14-07-2020 01:00	30-07-2020 05:00	☑
0084-R-550020	02-10-2019 15:05	Planned	Tunnel	Muiderberg aansl. (NL-1243)	Amsterdam Bijlmer ArenA (NL-74)		RFC8	14-07-2020 01:00	30-07-2020 05:00	☑

Save the filters

User can define and save the filters to avoid fill in the parameters each time they access to the TCR Tool. This can be done by using the "Save filter" button (marked in the brown circle).

To save the filters, user must do the following steps:

1. Set up one or more parameters for the filter (using the parameters related to the dates and extended parameters – explained above)
2. Save the filter by clicking the filter icon



IM reference I	Created at	Status	Reason for re	Location from	Location to	Affected IM	Involved RFC	Date/Time fro	De
0084-050684	01-07-2020 10:20	0	Bridge	Rotterdam Aansl Zuid (NL-1277)	Rotterdam Blaak (NL-529)			29-07-2020 00:00	30- 00:
0084-050682	01-07-2020 10:19	Planned	Others	Amsterdam Amstel (NL-57)	Amsterdam Lijnwerkplaats Midden (NL-1045)		RFC2, RFC8, RFC1	15-07-2020 00:00	22- 00:

3. Select the "Save filter" option

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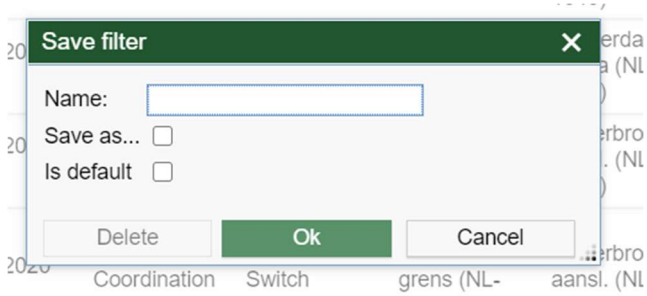


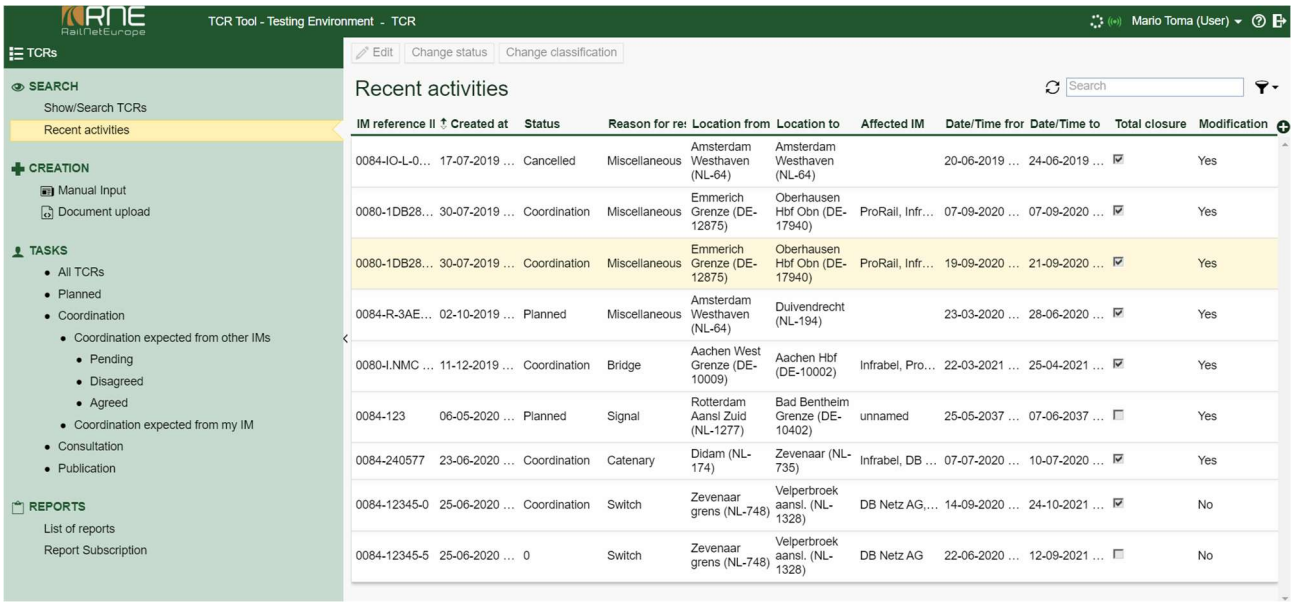
4. In the “Save filter” form enter the name of the filter and define is this filter will be used as default or not.
5. Press the “OK” button to finish the saving

User can define more filters.

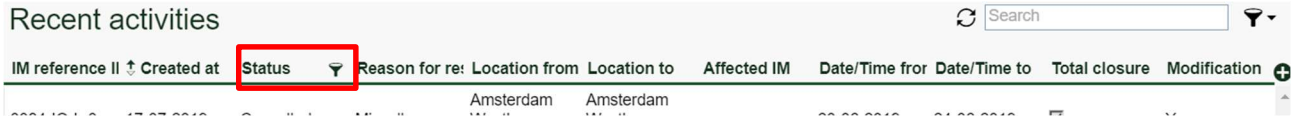
The default filter can be only one and this will be applied immediately after entering in the tool. The other filters can be selecting by clicking the filter icon and select the filter name that we want to apply.

1.2.2. Recent activities

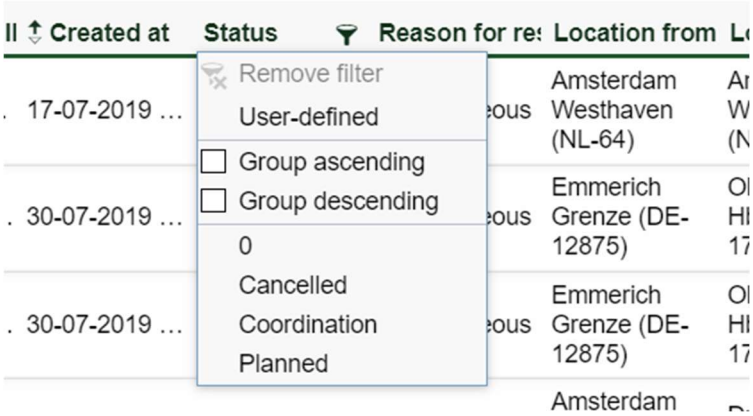
The recent activities are used to search the for the specific activities done on the TCRs.



Users are able to filter TCR activities by all the columns:



On move the mouse pointer over the column name (e.g. “Status”) a small filter icon is presented. By clicking this icon, the popup filter for the column is presented.

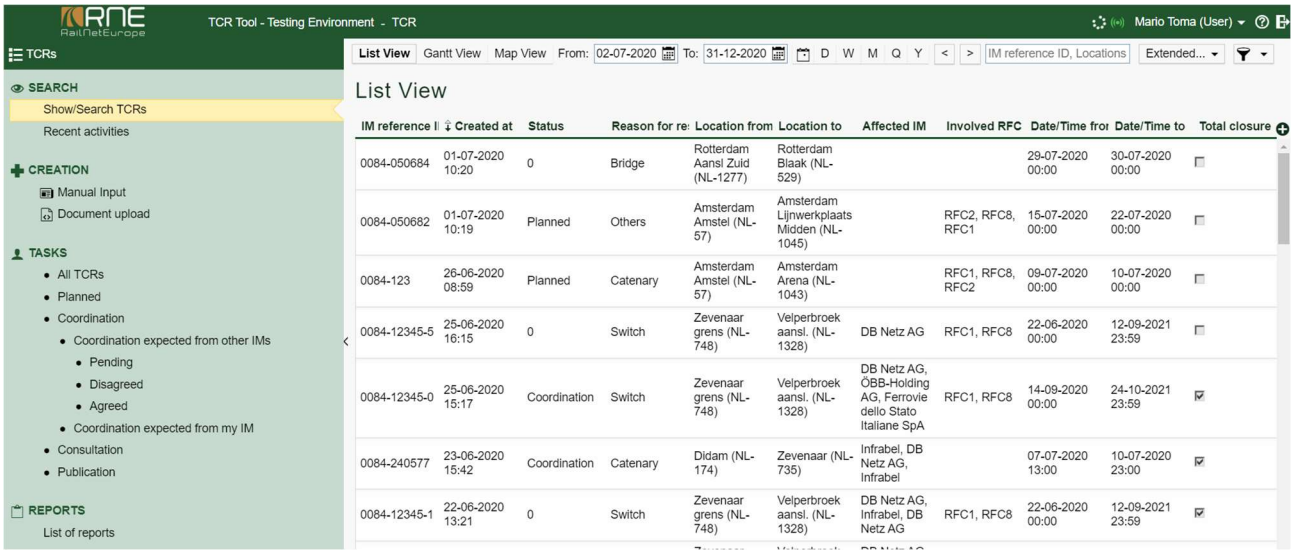


Using this popup filter, it is possible to select the exact values or define the “User-defined” filter to search the records per selected column. It is possible to filter the records by defining the filters on more than one column.

1.2.3. List view

The “List view” displays the list of TCRs in a table form with the most used attributes. Users can show/hide the additional attributes by their needs.

To present the “List view”, it is needed to click on the “Show/Search TCRs”. The first view that is presented is the “List view” with a list of all TCRs.



The “List view” has the following attributes that are presented by default:

- IM reference ID – ID that IM is using in their national tool (could be used for the automatic synchronization between national and central tool)
- Created at
- Status
- Reason for restriction
- Location from
- Location to

- Affected IM – IM that is affected by the TCRs
- Involved RFC – RFCs that are affected by the TCR
- Date/Time from
- Date/Time to
- Total closure

In any case, it is possible to add additional attributes to view or to hide attributes already displayed. To do that, the user has to click the “Column picker” button (“+” button) and select or deselect attributes (figure 23).

The selected attributes will be shown/hidden from the list.

Additionally, by clicking the column header (column name), the list results will be sorted by the ascending/descending order of the selected column.

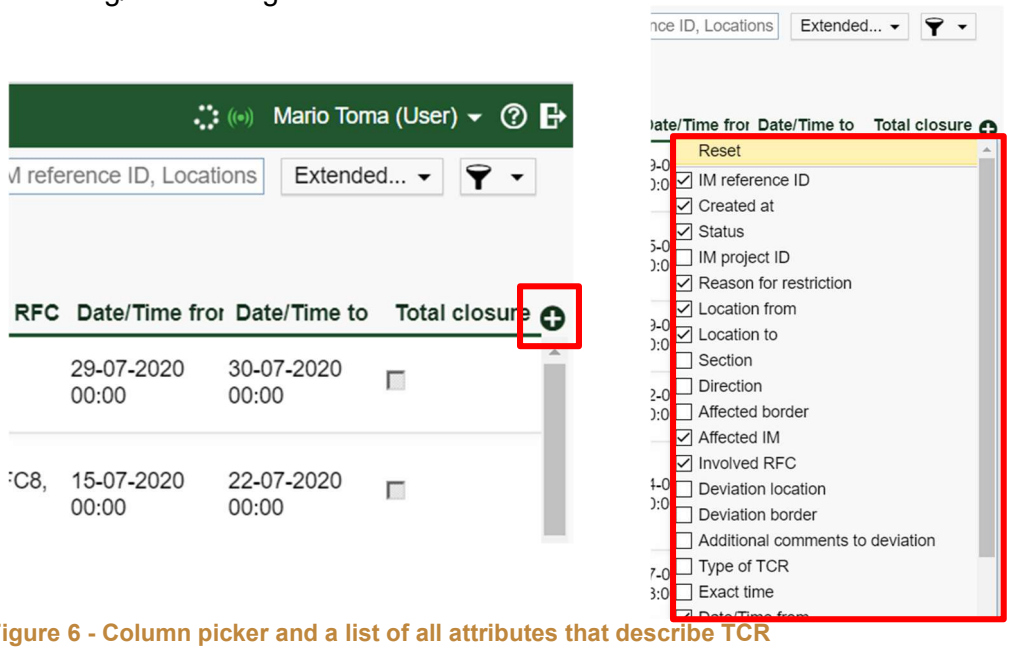


Figure 6 - Column picker and a list of all attributes that describe TCR

> Note: This view might lead to a confusingly large number of small columns. Depending on the screen resolution used, this view may, therefore, be unclear.

1.2.4. Gantt view

The Gantt-chart is used to represent the temporal expansion of TCRs. The same searching parameters apply to the Gantt View as on the List View (check the topic 1.5.1.1.).

TCRs, which match the search criteria, are shown in a list. The Gantt-chart window is divided into two sections:

- Data section
  By default, the Gantt-chart is opened in a compressed view, showing only sections on the y-axis. Planned TCRs within one section are summarized for overview purposes to one TCR in the compressed view. Sections are listed in ascending order based on the *date from* attribute of the first TCR in the respective section. The user is able to expand each section-overview by clicking on the section name in order to gather detailed information about every single TCR within a section.

- Graphical section
  The header of x-axis shows the timeline of the selected time period (date from, date to). TCRs are displayed on the x-axis and represented with a horizontal bar, whose length is proportional to its temporal expansion. The left end marks the beginning of the TCR and the right end marks the completion date. Furthermore, specific colour-coding for the impacts on the traffic is applied to the TCRs allowing the user for getting a quick reading of the work priority:
  - Total closure → red
  - Reduced track availability/ LT → yellow
  - Reduced track availability/ST → yellow
  - Speed restriction → yellow
  - Profile → yellow
  - Length → yellow
  - Weight → yellow
  - Diesel only → yellow
  - In addition to this color-coding, the Gantt-chart distinguishes between the different TCR types. Continuous TCRs are displayed with **full bars**, periodical (continuous) TCRs are crosshatched.

General functionality of the Gantt-chart

The Gantt-chart is opened in a collapsed view. By default, all TCRs within one section are comprised of one single TCR item shown as one single. The data shown in the data section is reduced to the section information and the date from/date to information of the TCRs (chronologically derived from the first and last TCR in this section).

The TCR bar

The TCR bar shows a compressed view of all contained TCRs. By expanding the compressed view, all TCRs within the respective section are displayed in ascending order based on their temporal occurrence presenting the affected segments by the TCR, the time span, the type of the TCR as well as the issuing IM of the TCR. Also, each TCR within the section is displayed in one row, allowing the user for determining TCRs, which run sequentially (periodical), in parallel to each other or overlapping. Basic TCR information (IM reference ID, the reason for the restriction, the location from/to direction and traffic measures) can be retrieved by hovering over the bar of the respective item. Clicking on the TCR item in the data section or on the respective bar opens the detail view of the selected TCR.

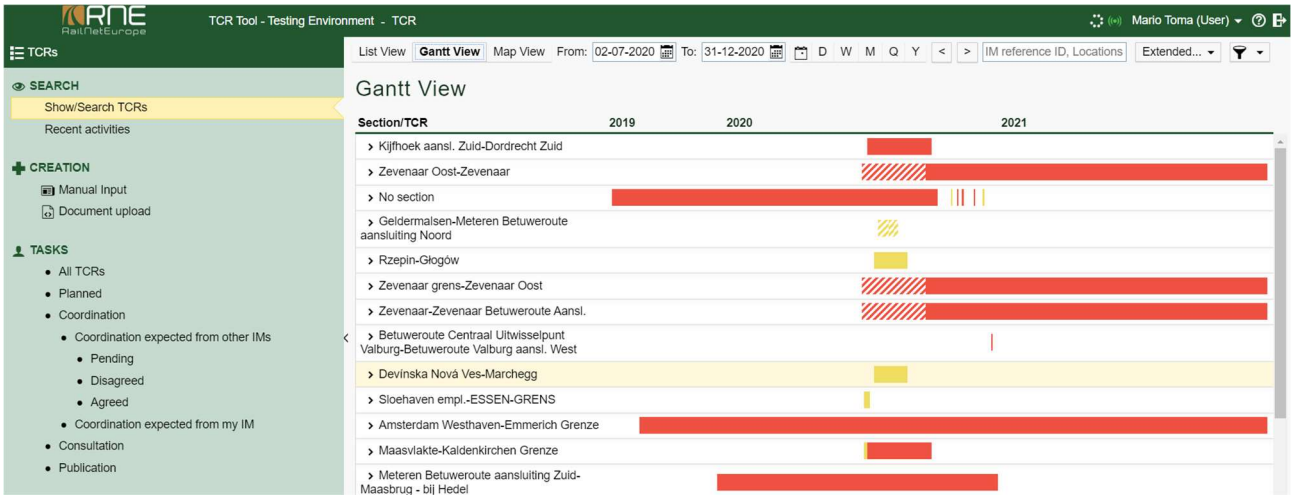


Figure 7 - Gantt View

1.2.5. Map view

The GIS map can be opened by pressing the button “Map View” (red marked). The map opens in the same window.

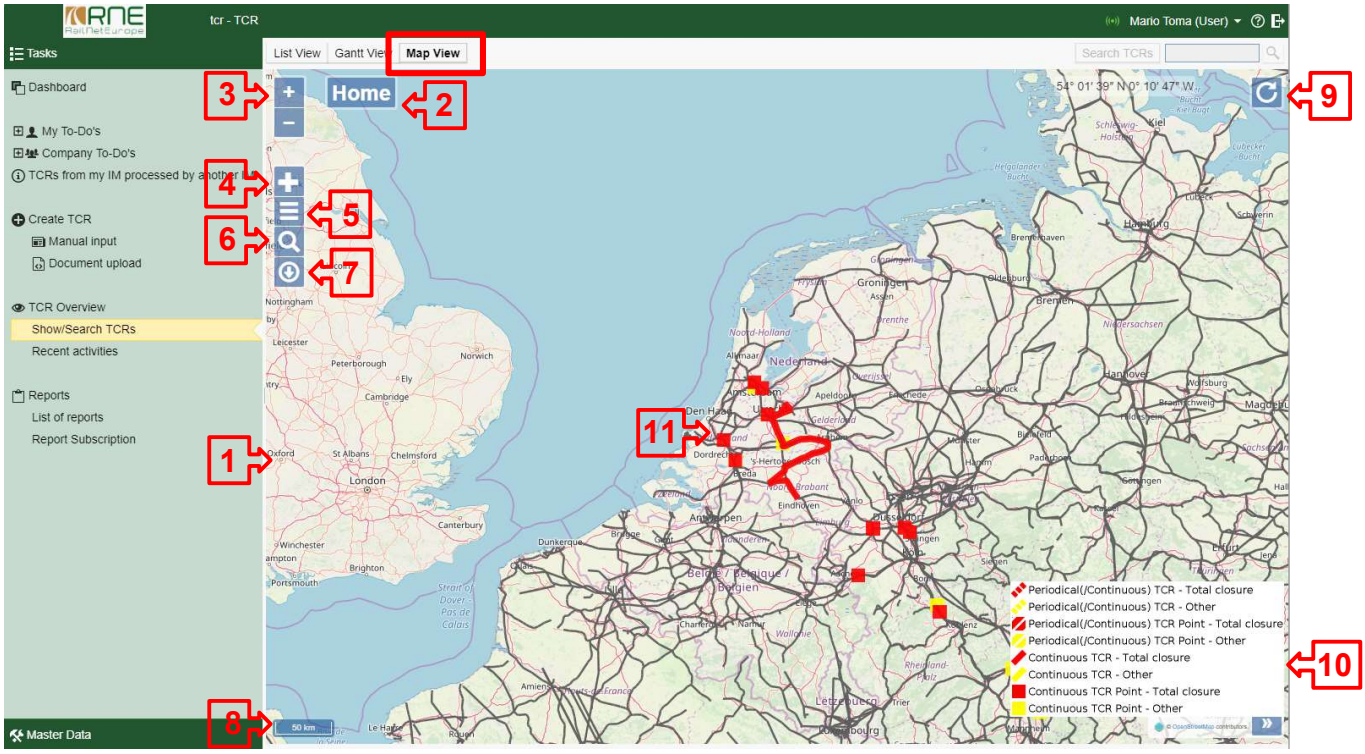


Figure 8 – Map View

With the map view, the TCR Tool provides the functionality to gather information of TCRs in their geographical context.

ID	Item	Description
1	Map picture section	The picture section of the map (used maps are the license free *OpenStreetMap* and *OpenRailwayMap*) allows the users to gather graphical information of the RNE network and TCRs. The details shown on the map are depending on the following parameters: - Zoom level - Enabled/Disabled layers - Set transparency Basic TCR information (IM reference ID, the reason for the restriction, the location from/to, section and direction) can be retrieved by hovering over a TCR in the map. Clicking on a TCR in the map opens the detail view of the respective TCR.
2	Autofocus	Upon opening the GIS-map, the system automatically focuses the picture section on the country of the logged in user. By clicking on this button, the system re-focusses the picture section to this default view.
3	Zoom in/Zoom out slider	Offers a zoom in/zoom out function. Depending on the zoom level, the GIS-viewer shows more or fewer details in regard to the sections, segments, locations and labels for the locations.
4	Adding/Removing layers	This button allows adding/removing various layers including - Segments - Sections - TCR layer (displaying TCRs) - RFC layers (each RFC can be displayed separately)

5	Set layer transparency	Allows to individually set the transparency for each layer in order to highlight specific layer information. This function works in combination with adding and removing layers. For instance, the user is able to display all RFCs, but set the transparency for each RFC separately for contrast purposes.
6	Search function	Present TCRs on the map based on respective search criteria
7	Export picture	Provides the functionality to save the current picture section as an image in the .png format based on the current settings (zoom level, enabled/disabled layers, layer transparency) to the file system.
8	Scale information	Provides a scale information in meter based on the current zoom level.
9	Rotate map	By clicking on this button, the user is able to rotate the map by inserting a rotation angle.
10	Attributions	Displays map related copyright information.
11	TCRs presentation	Presentation of TCRs on the map.

Table 1 Description of the GIS-viewer functionality

1.2.5.1. Drawing the geometry of the GIS objects in the TCR tool

The geometry of locations, segments and sections for each RFC is defined by the imported datasets from CAD, respective the entities location, segment, section. Multiple layers can be displayed at the same time to display the entire topology. The following picture illustrates how locations, segments and sections are interpreted to draw the GIS object geometry:

Figure 9 - Master data interpretation for drawing the GIS geometry

TCRs in the GIS-view are colour-coded based on the different reasons for restriction according to the RNE Guidelines for Coordination including the information in regard to the temporal expansion. Furthermore, the type of TCR (continuous, periodical, periodical continuous) is distinguished where each line for the types are displayed differently:

- Continuous TCR: solid line
- Periodical TCR: dotted line
- Periodical continuous TCR: dashed line

Depending on the zoom level, the GIS viewer shows more or fewer details, as illustrated above. Locations are labelled by the location name. TCRs are illustrated in the map by colouring the affected segment(s) different than the other segments and are labelled by the start and end date of the TCR.

1.3. Creation

The second group of functions is related to the creation and importing possibilities of the TCR Tool.

In this group two functions can be chosen:

- Manual input
- Document upload

1.3.1. Manual input

A new TCR can be either created directly via a form in the TCR tool or by selecting an MS Excel file in xlsx-format from the user's local file system or via a .xml interface.

> Note: that the system automatically detects parallel TCRs based on the time span and section of conflicting TCRs.

For creating a TCR via the from:

1. Select the "*Manual input*" of a TCR opens a standardized form. This form guides the user through the creation process of a new TCR and is divided into various sections for different types of business data as shown in the figure below. Mandatory fields are displayed bold.

2. When clicking on "*Insert*" the form is validated. Mandatory fields, which are not filled in, are highlighted with a red font colour upon submitting the form.

3. If all mandatory fields are filled the TCR is created and put, depends on the defined status, in the list that corresponds to the defined status under the "Tasks" group of functions

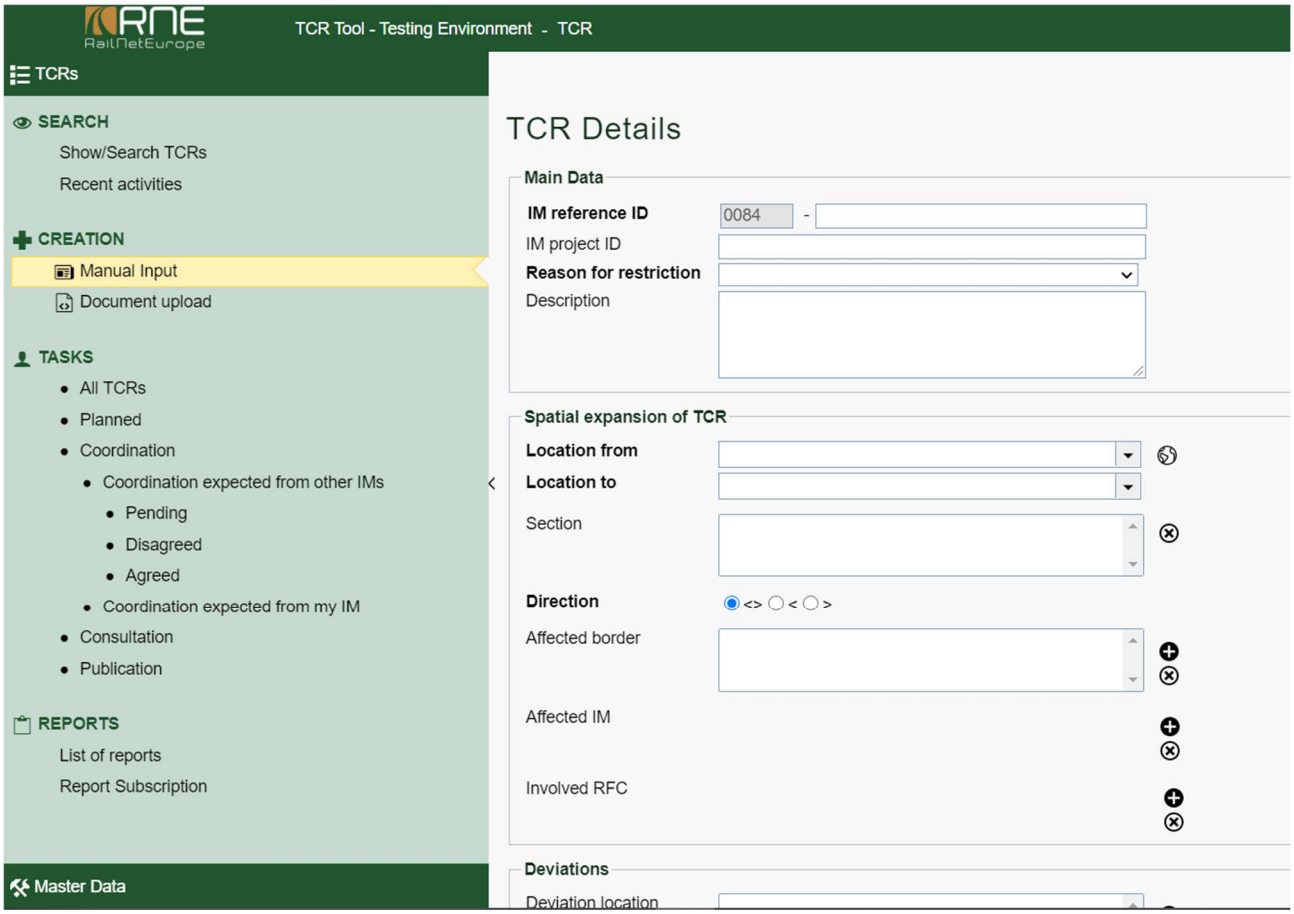


Figure 10 - Standardized form for manually inserting TCRs

TCR main data

This section provides main information about the TCR including a unique identifier, the reason for restriction and an optional description.

Field name	Description	Free Editing / Data Validation	Mandatory
IM reference ID	Shows the UIC code 920-14 for the respective IM in a read-only field followed by a reference for the project ID in a free text field.	Free text, no validation	Yes
IM project ID	References to the project ID of the TCR issuing IM.	Free text, no validation	No
Reason for restriction	Gives an indication about the works regarding the TCR. Hovering over the question mark icon next to the label shows the following description: **) mainly for rebuilding of stations or new infrastructure* ***) e.g. works on platforms, walls, noise protection walls, special installations, etc.*	One of the given values can be selected.	Yes
Description	Brief description of the TCR.	Free text, no validation	No

Table 2 Field definitions for the TCR main data

Spatial expansion of the TCR

The content of this section governs the spatial expansion in terms of the affected location/s, section, direction, affected border and affected IM.

Field name	Description	Free Editing / Data Validation	Mandatory
Location from	Defines the beginning location of the TCR. Only locations associated with the country of the issuing IM are displayed. The globe button opens the GIS-map allowing the user for selecting a location by clicking on it. The respective location value is automatically filled in in the form field. If the data of the current TCR causes a conflict with another TCR regarding this field, an exclamation mark icon is displayed. By clicking on the exclamation mark, a pop-up shows the details (Date/Time from/to, Location from/to, Type of TCR) of the TCR which causes conflicts. Independent of the conflict, the TCR can still be inserted.	One of the given values must be selected.	Yes
Location to	Definition of the ending location of the TCR. Only locations associated with the country of the issuing IM are displayed. The globe button opens the GIS-map allowing the user for selecting a location by clicking on it. The respective location value is automatically filled in in the form field. If the data of the current TCR causes a conflict with another TCR regarding this field, an exclamation mark icon is displayed. By clicking on the exclamation mark, a pop-up shows the details (Date/Time from/to, Location from/to, Type of TCR) of the TCR which causes conflicts. Independent of the conflict, the TCR can still be inserted.	One of the given values must be selected.	Yes
Section	Defines the section, within where the TCR occurs. This information is automatically derived from the chosen *Location from*/*Location to* value. If more than one section is derived, the user must select at least one of the options but is also able to select multiple section items.	-	No
Direction	Defines, which direction of the section is affected by the TCR (bi-directional, direction towards starting point of the location, direction towards end point of the location).	One of the given values must be selected	Yes
Affected border	If the selected *Location from* or *Location to* entity is defined as a border station, the value for the *Affected border* is automatically filled in and the harmonisation process is triggered.	One of the given values can be selected	No
Affected IM	If the selected *Location from* or *Location to* entity is defined as a border station, the value for the *Affected IM* is automatically filled in and the harmonisation process is triggered.	-	No
Involved RFC	Sections are mapped to RFCs. This information is derived from the automatically set *Section* value and automatically filled in by the system.	-	No

Table 3 Field definitions for the spatial expansion of the TCR

Deviations

In the case of need to define the deviation routes and borders, as alternative routes, this section should be used.

Field name	Description	Free Editing / Data Validation	Mandatory
Deviation location	Defines a location within the own network, where the rail traffic shall be re-routed. Clicking on the plus-icon ("+") adds an additional combo box to select another instance for a deviation location.	One of the given values can be selected	
Deviation border	Defines a border, where the rail traffic shall be re-routed. Clicking on the plus-icon ("+") adds an additional combo box to select another instance for a deviation border. Selecting a *Deviation border* triggers the harmonisation process.	One of the given values can be selected	No

Temporal expansion of the TCR

Time-based data and the temporal behaviour of the TCR are added in this section. A button to reset the temporal expansion of the TCR is displayed allowing clearing all entries in this section in order to make adaptions.

Field name	Description	Free Editing / Data Validation	Mandatory
Type of TCR	Defines the temporal expansion of the TCR. See paragraphs below this table for further information regarding the different types of temporal expansions of a TCR. If the data of the current TCR causes a conflict with another TCR regarding this field, an exclamation mark icon is displayed.	One of the given values must be selected	Yes
Time	Defines, whether the time for the TCR is known or unknown. Note: the option to select an unknown time for periodical continuous TCRs is not available since it does not enable any additional scheduling information, which could not be covered with the combination "*Periodical*" and "*Exact time unknown*".	One of the given values must be selected	Yes
Date from	If the exact time of a TCR is known, a date/time range can be defined. A combo box allows selecting the *Date to* value	The selected value must have a valid date. Incorrect information is highlighted.	Conditional mandatory
Time from	If the exact time of a TCR is known, a date/time range can be defined. A combo box allows selecting the *Time from* value.	The date field must be entered and the selected value must have a valid time.	Yes
Date to	If the exact time of a TCR is known, the *Date/Time to* information can be defined using this date and time picker.	The selected value must have a valid date. Incorrect information is highlighted.	Conditional mandatory
Time to	If the exact time of a TCR is known, a date/time range can be defined. A combo box allows selecting the *Time to* value.	The date field must be entered and the selected	Yes

		value must have a valid time.	
Year from	If the exact time of a TCR is unknown, a year/week range can be defined. A combo box allows selecting the *Year from* value.	-	Conditional mandatory
Week from	If the exact time of a TCR is unknown, a year/week range can be defined. A combo box allows selecting the *Week from* value.	-	Conditional mandatory
Year to	If the exact time of a TCR is unknown, a year/week range can be defined. A combo box allows selecting the *Year to* value.	-	Conditional mandatory
Week to	If the exact time of a TCR is unknown, a year/week range can be defined. A combo box allows selecting the *Week to* value.	-	Conditional mandatory
Working days	Selecting either a periodic or a periodic continuous TCR allows the user to define specific working days.	-	Yes
Weekly interval	Defines the weekly interval of the planned works. E.g. *2* would mean, that the works happen every other week.	-	Yes
Duration	Self-calculated indication of the total amount of time for the TCR. Note: The duration field in the Excel-file is currently filled in manually and there is no particular form on how this information has to be given (e.g. 11 days, 9 d, 600 min., 270'/300', 1 week-end, etc.). Because of this circumstance, the TCR-Tool is not able to interpret and validate free text. Therefore, the duration information upon the import will be inserted without validation of the factual accuracy. However, if the information regarding the temporal expansion is changed in the TCR-Form, the system automatically computes the right duration and overwrites the imported value. For TCRs with a known exact time the duration is displayed as follows as a read only information: - Continuous TCRs: *sum of days/hours (e.g. 15d+4h)* - Periodical TCRs: *sum of repetitions, duration (in hours) of each work and weekly interval (e.g. 12x 4h every 2 weeks)* For TCRs with an unknown exact time an indication regarding the duration can be given manually. Note: As this information is given as free text, no validation regarding the content is made.	Free text, no validation	No

Table 4 Field definitions for the temporal expansion of the TCR

The user can choose one of the following scenarios as shown below:

Figure 11 - Scenario selection for the temporal expansion of the TCR

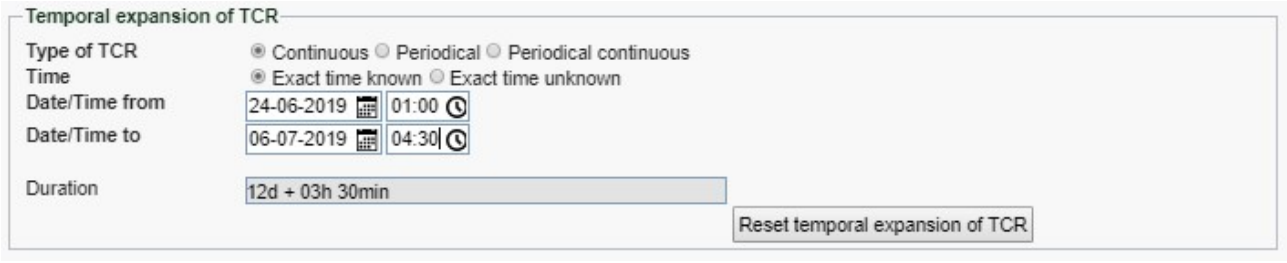
a) Continuous
These events are characterized in a way that they occur non-stop during the TCR (e.g. a complete closure of a track from 01.07.2017 to 01.09.2017).

b) Periodical
The characteristic of this event is described with a repeating pattern (e.g. work activities happen each Saturday and Sunday from 02:00 to 04:15). For periodical works, specific working days can be selected with check boxes, where each checkbox represents the beginning day of each work. In the case of the given example with works on Saturday and Sunday from 02:00 to 04:15, the checkboxes Sat and Sun need to be ticked (not Sat, Sun and Mon). A help-text (tooltip) is displayed when hovering over the label for working days and giving a brief description about the logic behind the temporal expansion of the TCR.

c) Periodical continuous
This event is a hybrid form of the events named above (e.g., a TCR includes works, which happen every other week, continuously for four weekends from Friday 23:00 to Monday 05:00). For this type of TCR the periodicity arises from the weekday selected in the date/time picker for the start and end date of the TCR. E.g. selecting Friday 25 August 2017, 23:00 as beginning date/time and Monday 18 September 2017, 05:00 as end date/time implies that works happen periodically each Friday to Monday continuously from 23:00 to 05:00 in the time span 25 August to 18 September. A help-text (tooltip) is displayed when hovering over the label for working days and giving a brief description about the logic behind the temporal expansion of the TCR.

> Note: The “Periodical continuous” TCR type is still available in this version of the tool as a transition period. In the next version of the tool it will be removed

Choosing one of the described scenarios provides the user a selection regarding the duration of the TCR. Depending on whether the exact time is known/unknown different options for the temporal expansion of the TCR are offered as shown in the following figures.



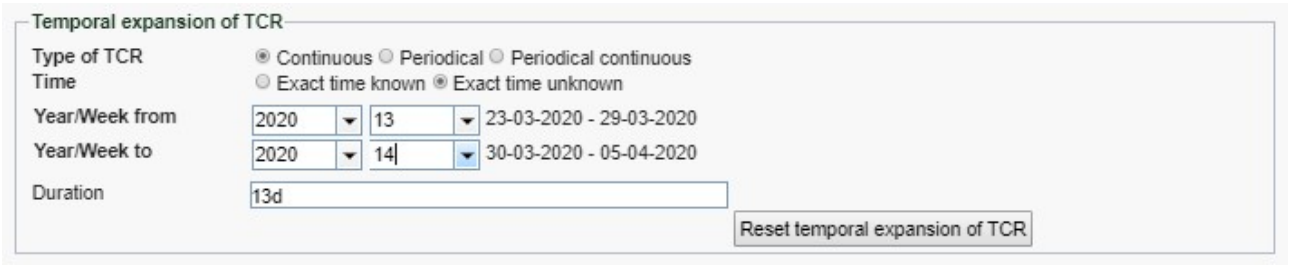
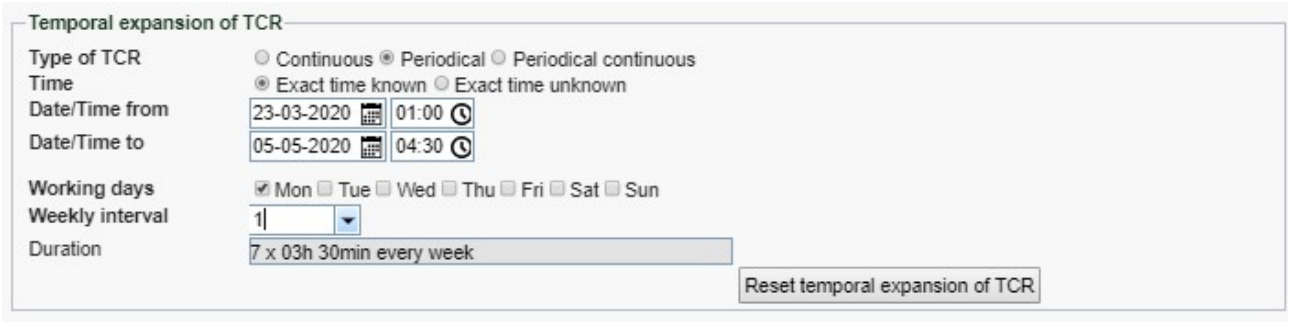


Figure 12 - Provided selections for the duration of a continuous TCR



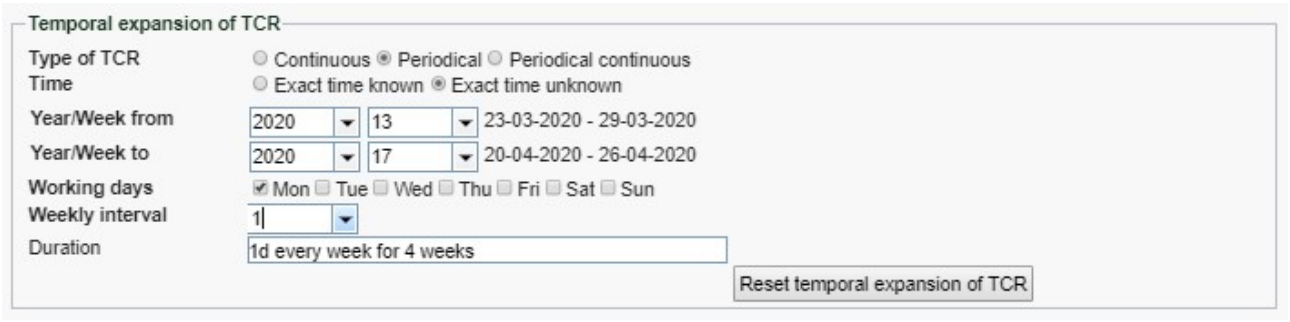


Figure 13 - Provided selections for the duration of a periodical TCR

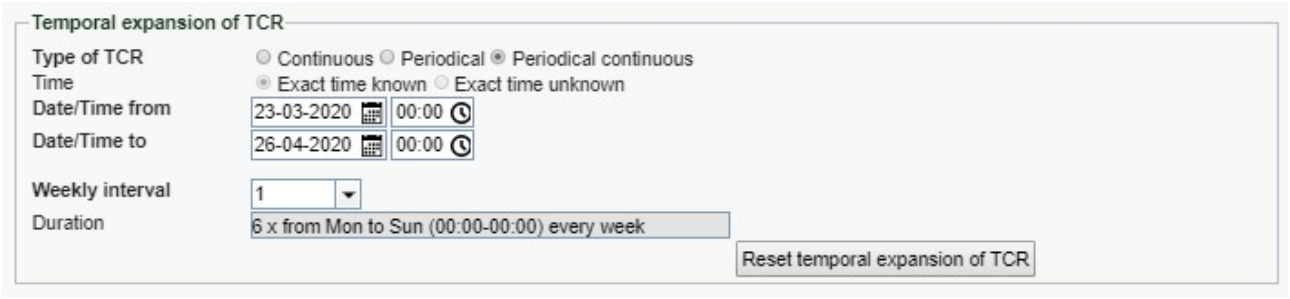


Figure 14 - Provided selection for the duration of a periodical continuous TCR

a) Exact time known - A date and time picker allow defining a specific date/time from/to timeframe using local time.
b) Exact time unknown - Combo boxes are displayed to limit the temporal expansion of the TCR in terms of year/week from/to.
c) Working days - Selecting a periodic or periodic continuous TCR allows to define working days via check boxes. Hovering over the question mark icon next to the label displays the user a short description regarding the business logic behind this field.
d) Weekly interval Selecting a periodic continuous TCR requires the definition of the weekly interval of the planned works in a text field. Hovering over the question mark icon next to the label displays the user a short description regarding the business logic behind this field.

Operational consequences

Information regarding the consequences of the TCR on the operations is given in this section. This includes the impact on traffic, classification of impact, traffic measures, and the incorporation of traffic measures in the yearly timetable.

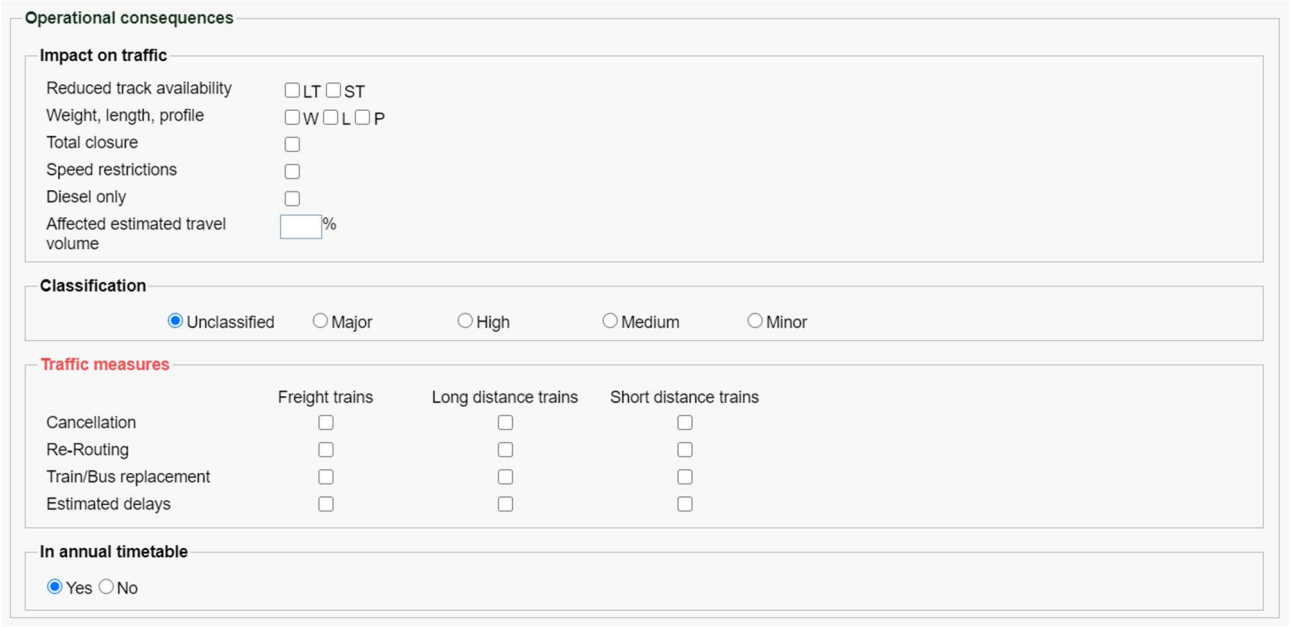


Figure 15 - Provided sections for the operational consequences

Field name	Description	Free Editing / Data Validation	Mandatory
Impact on traffic	Defines the impact on the traffic triggered by the TCR. The following impacts can be defined: - Reduced track availability - Weight, Length, Profile - Total closure - Speed restrictions - No catenary For the associated labels of checkboxes descriptions are displayed, when hovering over the respective label.	At least one of the given values must be selected.	Yes
Impact on traffic – Affected estimated travel volume	As part of the impacts on traffic, an estimation regarding affected travel volume as a percentage value can be defined. This field is only used for the manual creation of TCRs and does not affect the import of TCRs from external sources.	Only positive numbers are accepted. Three characters as maximum.	No
Classification	Classifies the impact of the TCR. By default, *Major* is selected. Hovering over the question mark icon next to the label shows the following description: *Major: >30 days and >50% impact on the estimated traffic*	-	Yes

	High: >7 days and >30% impact on the estimated traffic *Medium: ≤7 days and >50% impact on the estimated traffic* *Minor: ≤7 days and >10% impact on the estimated traffic* *Annex VII: The infrastructure manager may apply more stringent thresholds.* The values for *Major/High/Medium/Minor* have specified due dates, which can be managed by the administrator. The following due dates are used (referring to the beginning date of the TCR, not the end date): - TCR data editable - Due date for response - Due date for a TCR to be implicitly accepted By default, the following time values are defined in the TCR-Tool (Major/High/Medium/Minor): - TCR data editable ➔ x-24/x-24/x-13.5/x-6.5 - Due date for response ➔ x-18/x-13.5/x-13.5/x-6.5 - Due date for a TCR to be implicitly accepted ➔ x-17/x-12/x-4		
Traffic measures	Indication of traffic measures taken regarding the TCR. It has been agreed that the column *Regional trains* will be included in the data model but be set temporarily invisible. Furthermore, the label will be renamed to *Commuter trains*. Also, the import of TCRs using external sources only takes freight traffic into account. Passenger train related traffic measures are only defined when TCRs are created using the TCR form. Since the traffic measure "*Others*" is a too generic phrase with no provided additional information, this field will not be included in the form.	At least one of the given values must be selected.	Yes
Traffic measures – Estimated delays	As part of the traffic measures, an extra option to give an indication about the estimated delays for the different train types is available.	-	No
Traffic measures – Define delay minutes	A text field to define delay minutes for the train type will be enabled once the respective checkbox *Estimated delays* for a train type has been ticked.	Only positive integers are accepted.	No
Traffic measures – Define capacity to use	As part of the traffic measures, an extra capacity indicator option is available. It allows the user to enter how the remaining capacity should be allocated to the different transportation modes. It has been agreed that this capacity usage indicator will be included in the data model but be set temporarily invisible.	The total percentage for the capacity to be used is limited with 100%. If this value is exceeded the field label will be highlighted.	No

Additional comments to deviation	Gives an addition to the deviation selection. Field will be enabled once *Deviation location* or *Deviation border* has been selected.	Free text, no validation	No
International coordination	Gives an additional information regarding the international coordination. Field will be enabled once the international harmonisation process has been triggered.	Free text, no validation	No
In annual timetable	Selection whether the TCR has been incorporated in the annual timetable	-	No
Indication of timetable adaption	Gives an indication when the timetable shall be adapted. Field will be enabled once "*No*" has been selected for the field *In annual timetable*.	Selected value must have a valid date. Incorrect information is highlighted.	Conditional mandatory

Table 5 Field definitions for operational consequences

TCR Status bar

In the TCR status bar, it is possible to define the status, publication and the promotion process that will be applied.

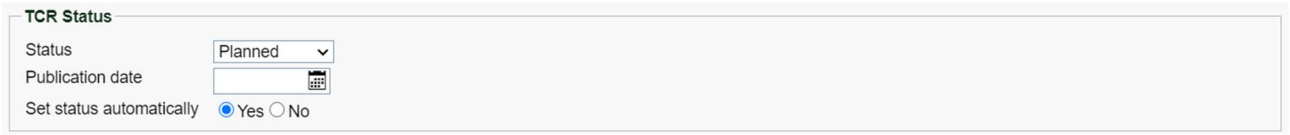


Figure 16 - Provided sections TCR status and the publication date

Field name	Description	Free Editing / Data Validation	Mandatory
Status	Defines the current status of the TCR	One of the given values must be selected.	Yes
Publication date	The date of the TCR publication	Date	Yes
Set status automatically	It defines if the automatic promotion process of the TCR to the publication will be applied or this promotion will be done manually	By default "yes"	Yes

Via GIS map (as part of the creation process of a TCR)

When a user creates or modifies a TCR, the TCR form allows for the fields *"Location from"* and *"Location to"* to select a location in the GIS viewer. There are globe-buttons (red marked 1 in the following figure) next to the mentioned input fields. Once the user clicks the button, the GIS viewer opens and shows the topology. The map is focused on the country of the logged-on user (e.g. Netherland) but does not show any existing TCR´s.

By clicking on one of the locations shown on the map, the selected name of the location appears in the pop-up window and is presented as start or end point depends on clicking the "Start" or "End" button in the pop-up window (red marked 2 in the following figure). The chosen

locations are set in the corresponding field in the TCR form. The “Close” button is used to close the pop-up window on the map.

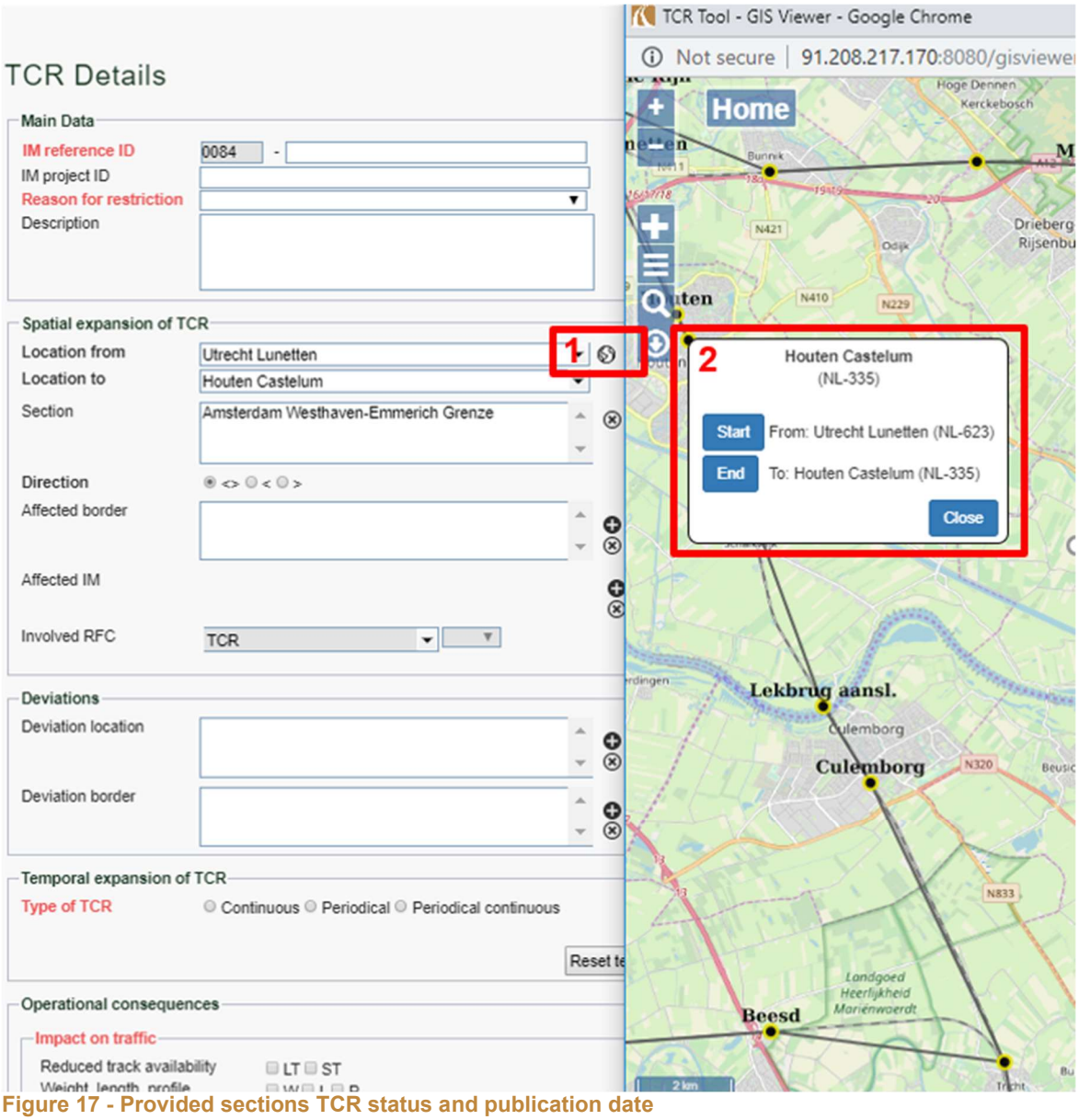


Figure 17 - Provided sections TCR status and publication date

1.3.2. Document upload

To manually import TCRs in *.xls or *.xlsx (RNE standard), the Excel file used for importing a TCR needs to follow a pre-defined structure (see the defined structure under **Error! Reference source not found.**).

Following steps are necessary:

1. Click on “*Document upload*” (red marked-1)

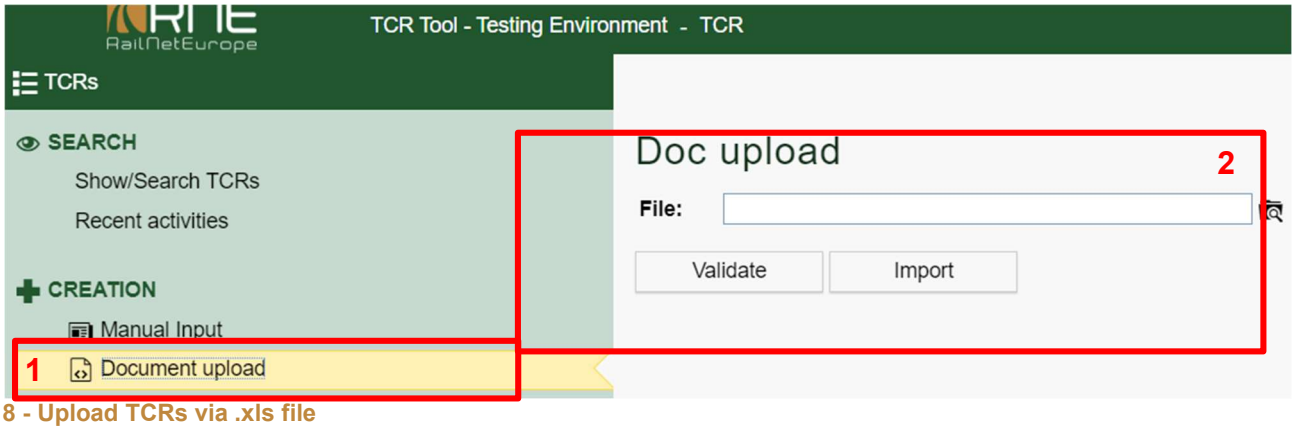


Figure 18 - Upload TCRs via .xls file

2. Click the button near to file field ( ).
3. A file browser window is opened. Use the file browser window to select the Excel template mentioned in the precondition.
4. The “Excel” file has been selected (red marked-2).
5. Click the “*Validate*” button to process the chosen file.
6. In case of errors, the TCR tool responds with a detailed error report (*figure 19*). The error report gives a detailed explanation of what is wrong and should be corrected before a next upload.

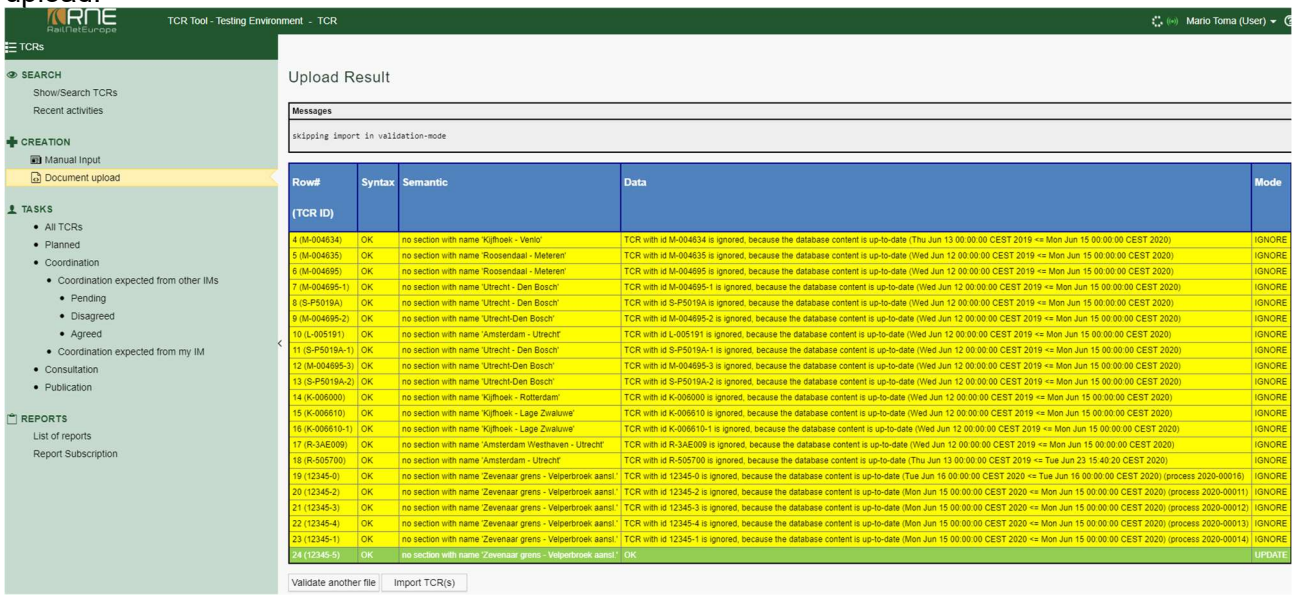


Figure 19 - Validated file with errors

7. After correcting all errors, start again from step 1 (by clicking the “Document upload” button)
8. If no validation and/or consistency errors occur after the validation, the “Import” button will be available in the bottom of the report (marked red in figure 19).

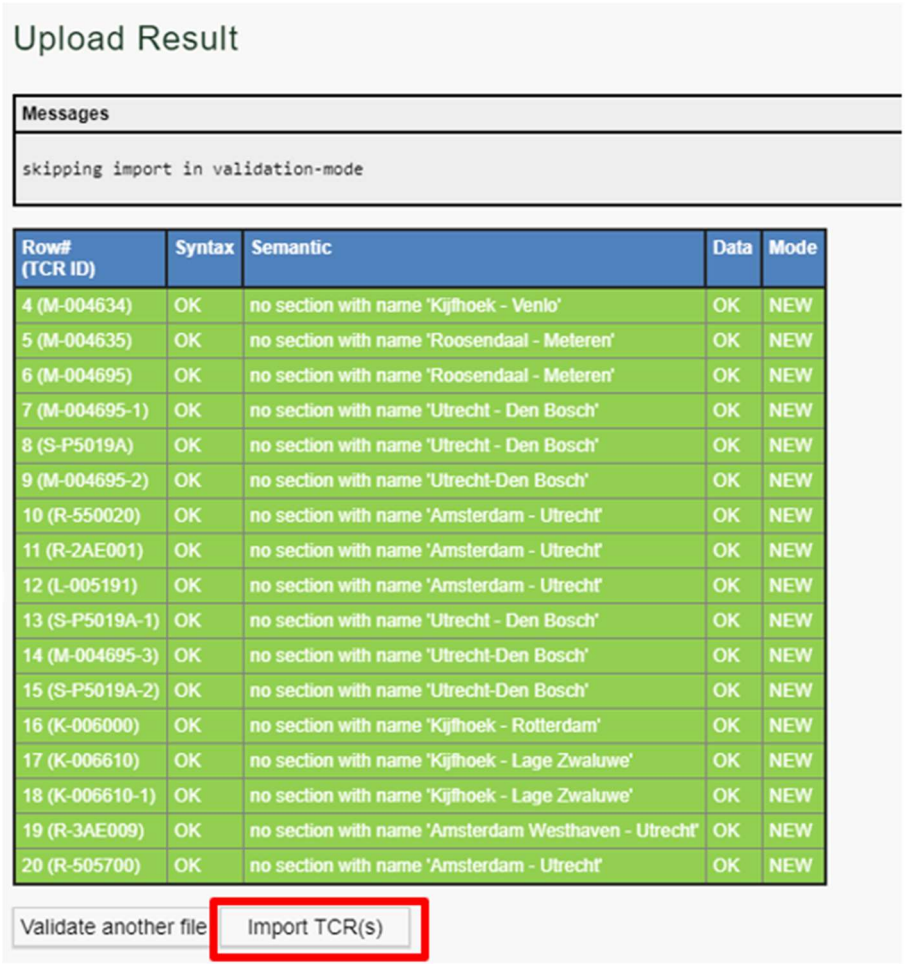


Figure 20 - The excel import file has been successfully validated

9. Click on "*Import*" button for the recently uploaded and validated file.
10. All the imported TCRs will be presented in the "All TCRs" under the "Task" group of functions
11. The recently imported TCRs are displayed in the "*Processed & Released*" list by records in bold.

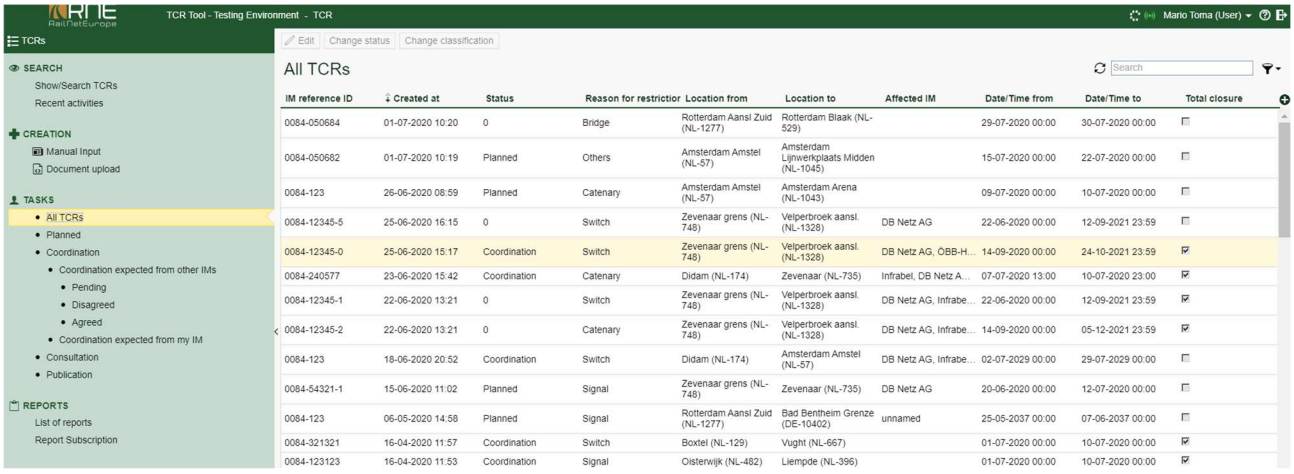


Figure 21 - A new imported data records

In case you try to import file with data that are already imported into the TCR tool, the tool will give you warnings for each record that is already imported (figure 19).

Row# (TCR ID)	Syntax	Semantic	Data	Mode
4 (M-004634)	OK	no section with name 'Kijfhoek - Venlo'	TCR with id M-004634 is ignored, because the database content is up-to-date (Wed Jun 12 00:00:00 CEST 2019 <= Wed Jun 12 00:00:00 CEST 2019) (process 2019-01756)	IGNORE
5 (M-004635)	OK	no section with name 'Roosendaal - Meteren'	TCR with id M-004635 is ignored, because the database content is up-to-date (Wed Jun 12 00:00:00 CEST 2019 <= Wed Jun 12 00:00:00 CEST 2019) (process 2019-01757)	IGNORE
6 (M-004695)	OK	no section with name 'Roosendaal - Meteren'	TCR with id M-004695 is ignored, because the database content is up-to-date (Wed Jun 12 00:00:00 CEST 2019 <= Wed Jun 12 00:00:00 CEST 2019) (process 2019-01758)	IGNORE
7 (M-004695-1)	OK	no section with name 'Utrecht - Den Bosch'	TCR with id M-004695-1 is ignored, because the database content is up-to-date (Wed Jun 12 00:00:00 CEST 2019 <= Wed Jun 12 00:00:00 CEST 2019) (process 2019-01759)	IGNORE
8 (S-P5019A)	OK	no section with name 'Utrecht - Den Bosch'	TCR with id S-P5019A is ignored, because the database content is up-to-date (Wed Jun 12 00:00:00 CEST 2019 <= Wed Jun 12 00:00:00 CEST 2019) (process 2019-01760)	IGNORE
9 (M-004695-2)	OK	no section with name 'Utrecht-Den Bosch'	TCR with id M-004695-2 is ignored, because the database content is up-to-date (Wed Jun 12 00:00:00 CEST 2019 <= Wed Jun 12 00:00:00 CEST 2019) (process 2019-01761)	IGNORE
10 (R-550020)	OK	no section with name 'Amsterdam - Utrecht'	TCR with id R-550020 is ignored, because the database content is up-to-date (Wed Jun 12 00:00:00 CEST 2019 <= Wed Jun 12 00:00:00 CEST 2019) (process 2019-01762)	IGNORE

Figure 22 - The TCRs are already imported into the tool

If you need to make some modification on already imported record/s and import these records again in the tool, it is possible. It is needed to do the necessary modification in the excel file and after that, you have to update the “Last updated” cell with a new date in each row in which you did changes.

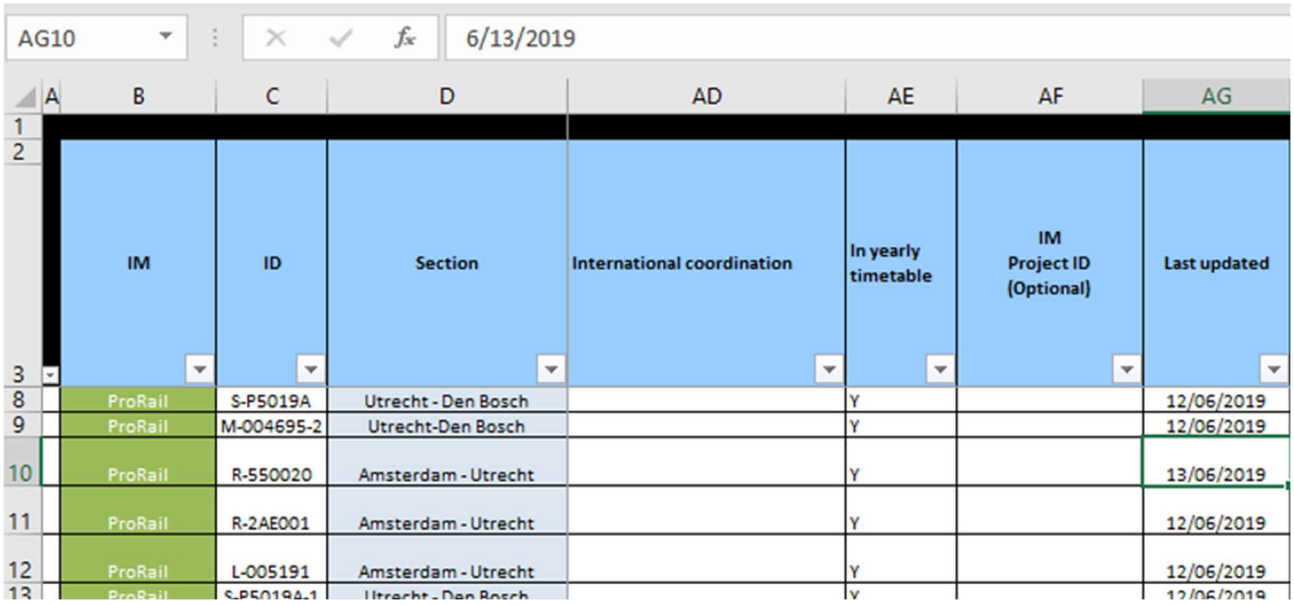


Figure 23 - Upload already imported data

The same procedure that is written above (from step 1) should be followed.

Details on validation

After processing the document import, the user will be informed via a validation report if any errors occurred. Basically, the upload will validate against:

- the user’s authorisation to create a new TCR depending on the provisioned transactional data
- if there are any mandatory attributes not provided in the import template
- if there are consistency issues with related master data

An imported TCR is created in the state *imported*.
An import of TCRs from an Excel File will be done in two basic steps:

1. Validation: Scan the Excel file and check data consistency.

A report will be generated which contains a list of identified errors and warnings. If the report contains errors, the user must correct the data in the import file (either by changing the data in a national system which produces the import file, or in the file directly). No data is created in the system. The updated file shall be validated as long as the report contains no errors.

2. Import: When the validation report contains no errors, the TCRs defined in the file are created in the system. A workflow is started for each imported TCR.

The import-validation parses through all TCRs in the Excel file row by row and performs some checks for each line. The result of the checks is written into the validation report. The following validation-phases are performed for each row (=TCR) in the given order:

- Syntactic Checks: all columns of the Excel file are checked to comply to the allowed type / values. This check will e.g. identify if a numeric field contains other characters than [0-9].
- Semantic Checks: all columns of the Excel file are checked to comply to the constraints defined in the table on page 21-22. This check will e.g. identify if a mandatory field is empty
- Checks against existing data: all rows are checked as illustrated in the following figure. During this phase, each TCR in the import will be checked one by one. The currently checked TCR is called TCR-I in the illustration. The goal is to check which import mode shall be applied to the TCR-I. Possible modes are:
  * NEW: no TCR exists in the DB with the same ID as TCR-I
  * UPDATE: there exists a TCR-DB in the database with the same ID as TCR-I. This TCR-DB will be updated according to the values of TCR-I
  * CANCEL: there exists a TCR-DB in the database with the same ID as TCR-I. This TCR-DB will be cancelled
  * IGNORE: the TCR-I will not be imported

  Furthermore, the check identifies conflicting situations by raising an ERROR for TCR-I, e.g. if a TCR-DB shall be updated which is not editable by the importing IM.

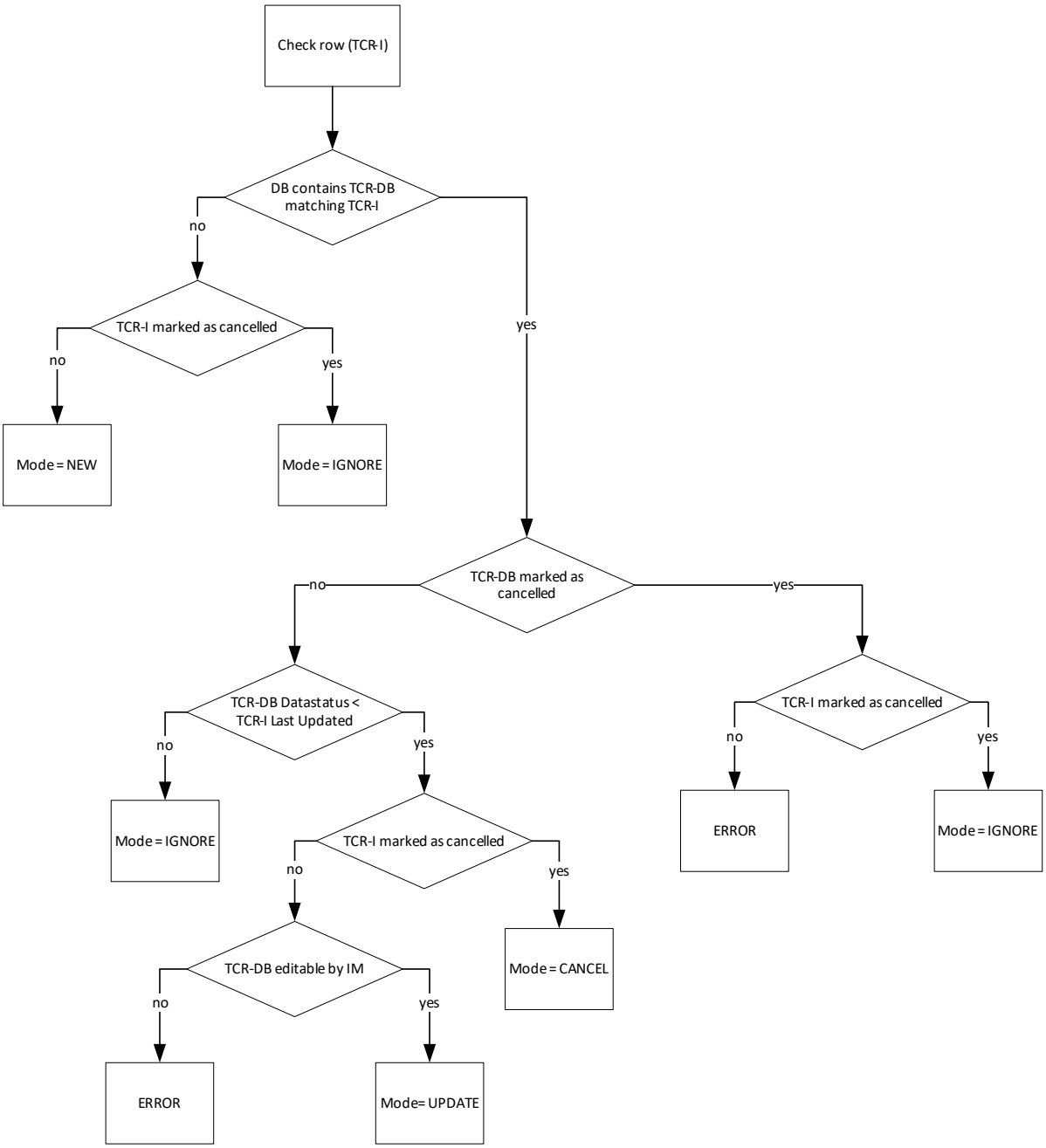


Figure 24 - Checks against existing data

The import validation is executed row by row on all TCRs of the Excel file. The validation-phases are executed in the order given above. If one of the phases results in an ERROR, the subsequent phases are skipped. The result of the validation is summarized in a report of the following structure:

Row# (TCR ID)	Syntax	Semantic	Data	Mode
3 (1452342)	OK	OK	OK	NEW
4 (983249)	OK	No Match for Location From (Column F) found Direction (Column E) shall not be null		
5 (3453245)	OK	OK	OK	IGNORE
6 (234734)	OK	OK	OK	UPDATE
7 (94563212)	OK	OK	TCR 94563212 currently assigned to IM B	
8 (34534234)	OK	WARNING: Calculated duration does not match given duration	OK	NEW
…	…	…	…	…

Table 6 Structure for results of the validation process

Each row (=TCR) in the report is colour-coded:

- If no errors or warnings occurred, the row is marked green.
- If the row will be ignored for the import, the row is marked yellow.
- If a waring occurred during one of the checks, the first column and the column of the corresponding check is marked orange. The same concept applies to errors, except that the columns are marked red.

Conflict solution

When creating a TCR via the TCR form, data validation routine checks if the entered data for the new or updated TCR causes a conflict with already submitted TCRs. The validation routine is as follows:

> Note: When a TCR is created or updated, the timespan and the section of the planned TCR are validated against all existing TCRs that are not in status cancelled. In case there are already one or more existing TCRs in the same time span and section, the user will be informed with a dialog window.

The information in this dialog includes the IM reference ID, the spatial/temporal expansion of the TCR and a link to open the respective TCR. The dialog window offers the user to apply the new/updated data or to change the timespan/section for the respective TCR. If the user applies the data, which cause a conflict with existing TCRs, an exclamation mark icon is displayed next to the affected data field. If the TCR is created/updated by the import functionality and conflict is identified, a WARNING will be added to the validation report.

1.3.3. Via *.xml

The import can be done via manual XML import. The procedure is the same as for the import of the Excel file above.

To manually import TCRs in *.xml (TCR XSD based on TAF/TAP- TSI standards), the following steps are necessary:

1. Click on “Document upload”
2. Select the file XML file
3. Click the “Validate” button to check if there are consistency issues with related master data.
4. In case of errors, the TCR tool responds with a detailed error report (*figure 19*). The error report gives a detailed explanation of what is wrong and should be corrected before a next upload.
5. If no validation and/or consistency errors occur after the validation, the “Import” button will be available in the bottom of the report (marked red in figure 19).
6. Click on “*Import*” button for the recently uploaded and validated file.
7. Check the list “All TCRs” under the “*Tasks*” in the navigation menu. After the file has been processed, the label is written with bold letters indicating that a new dataset is added
8. The recently imported TCRs are displayed in the “*All TCRs*” list by records in bold.

1.4. Tasks

The third group of functions is related to the possibilities of the task to work with the TCRs. All TCRs from own companies are presented and users do the necessary job with them, like update TCRs, promote TCRs among the statuses, coordinate TCRs, cancel them, etc.

In this group two functions can be chosen:

- All TCRs
- Planned
- Coordination
  - Coordination expected from other IMs
    - Pending
    - Disagreed
    - Agreed
  - Coordination expected from my IM
- Consultation
- Publication

The functions in this group are related to the statuses of the TCRs, to faster focus on the TCRs that must be managed.

In the “Tasks” group, only the TCRs from the own organization are presented, except in the “Coordination expected from my IM”, where are TCRs from the neighbouring IMs which own organization must assess.

1.4.1. All TCRs

In this “All TCRs” list, the TCRs that were manually created or imported via Excel or XML files from the user organization, are presented.

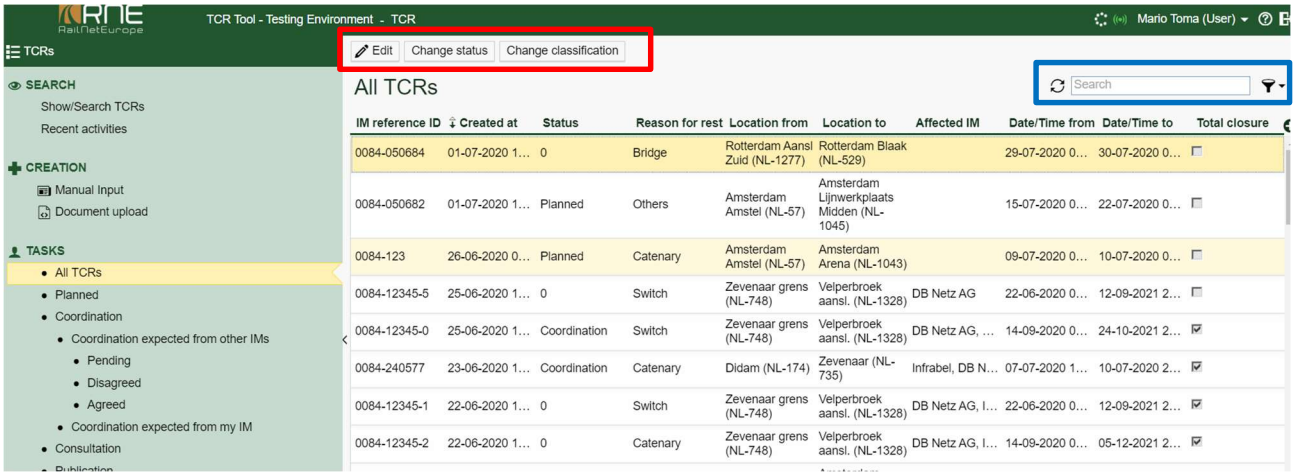


Figure 25 – All TCRs list

Users can do all the necessary jobs with the TCR by editing their attributes or changing the status and classification. The actions that can be done are marked in the red rectangle, as presented in the image above.

To easier the search of the TCRs to work on, the users have two possibilities:

- Use the quick search possibilities (marked with a blue rectangle) – that can be used to search the entered value per all fields.
- Use the search implemented in the table to filter TCR per columns value

When move mouse over the column header (column name), a new icon is presented (in a red circle in the image below).

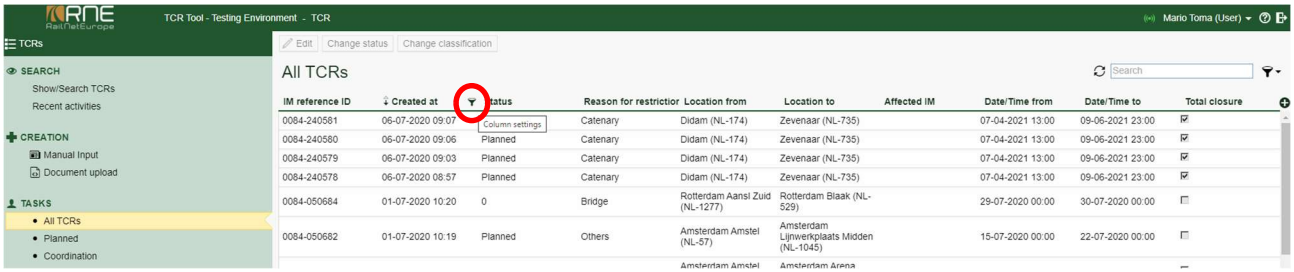


Figure 26 – Table filtering icon

By clicking the filter icon, the list with all defined values in the column is presented, with additional possibilities to set up the “User-defined” filter and sorting options (*see the image below*).

Figure 27 – Table filtering options

After choosing the “User-defined” option, from the list that is opened, the user can define the filtering values, to be applied to the table (*figure 27*). The filtering values can be set up on more columns and they are combined.
User can save more filters, and also delete them if not necessary anymore.

Created by mario.toma@rne.eu

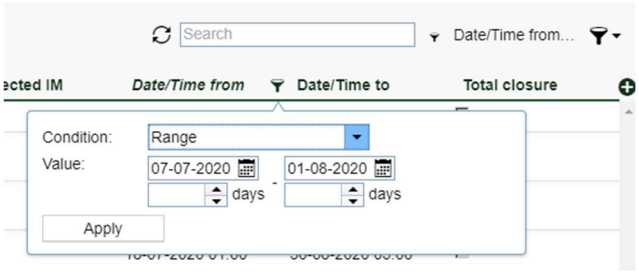


Figure 28 – Date/Time filtering parameters

The created filter can be saved and reuse, to avoid the same filter definition each time when the same parameters will be checked.

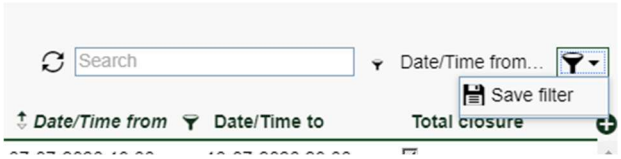


Figure 29 – Saving the filter

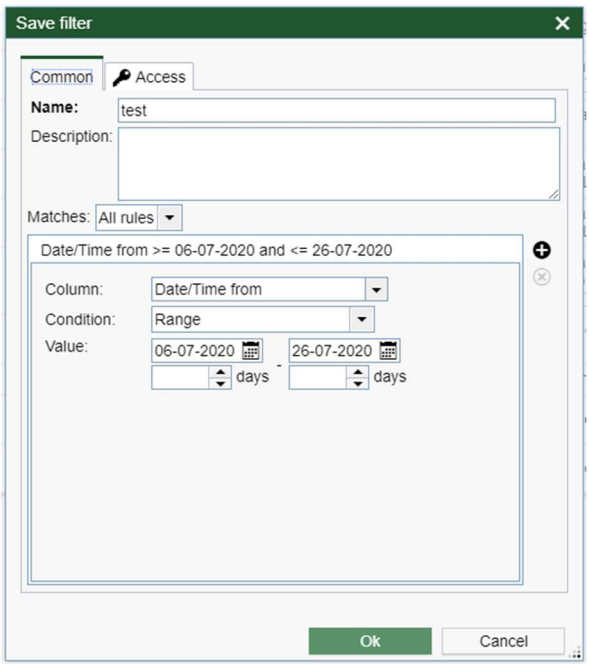


Figure 30 – Save filter options

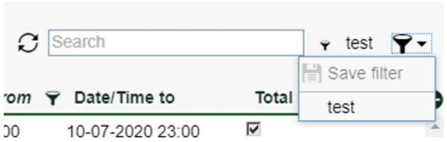


Figure 31 – Chose the filter from the list

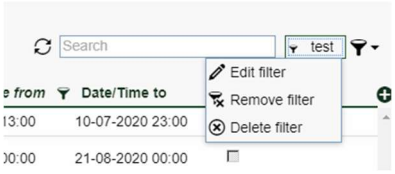


Figure 32 – Manage the saved filter

The different filters can be defined for each list in the “Tasks” group of functions.

To manage the filter, the filter that we want to manage should be selected and then the button near to filter icon with the filter name must be selected (*figure 32*).

Detail view

By double-clicking the TCR in the list or press the “Edit” button on the top of the page, the TCR is opened in the Detail view in which users can update all the TCR attributes, change the statuses and do all the necessary job with it.

The TCR detail view allows for capturing all relevant TCR data of the current step and state. The displayed information relies on the configured properties and fields of the data model. Currently, responsible editors of TCRs can make changes to the TCR (e.g. change field entries or the state of a TCR). In the TCR detail view, the user can retrieve the following TCR information via a tab bar as shown in the following figure (red marked in the image below):

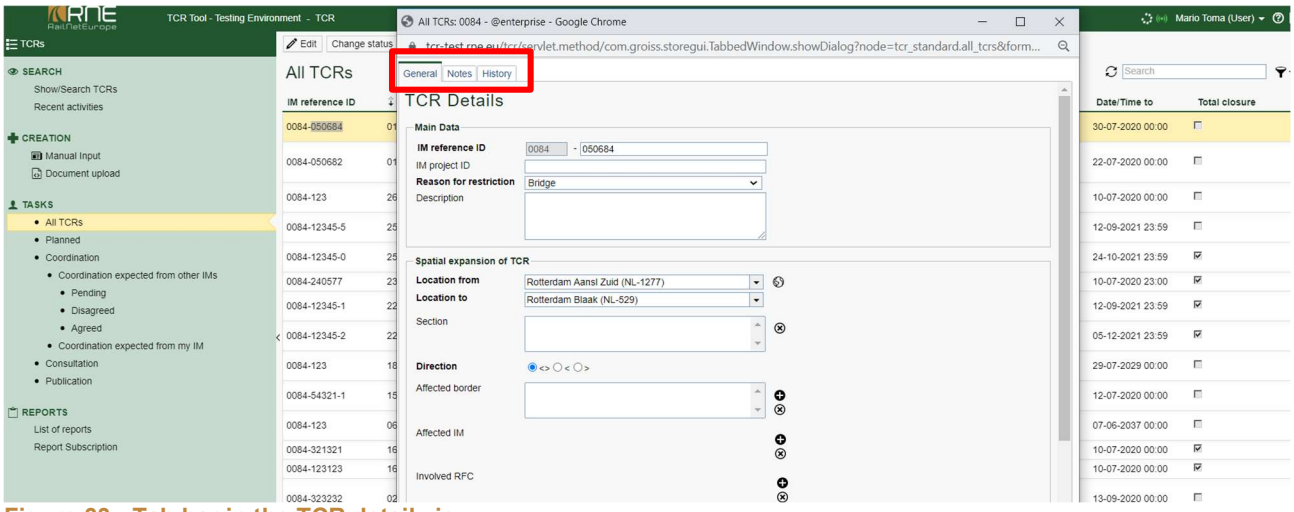
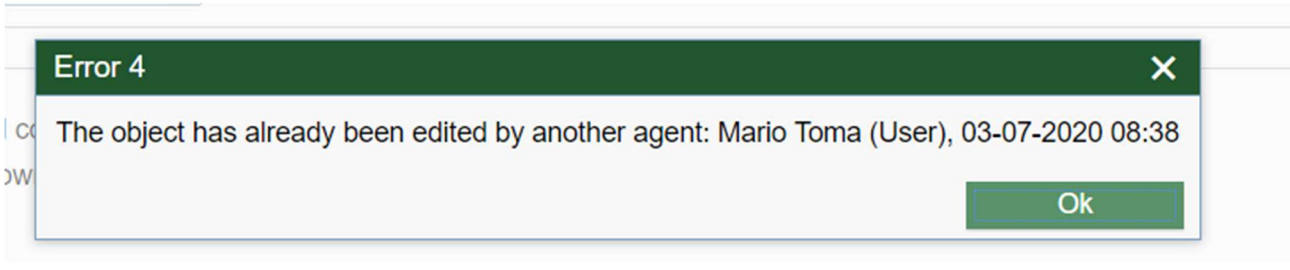


Figure 33 - Tab bar in the TCR detail view

- **General**

  The TCR general tab shows the TCR form, which is also used to manually create a TCR. For a user, it is possible gathering TCR information and making user interactions according to the current process step and the assigned user/role permissions. The information showed (data fields) in the TCR general tab as well as the possible user interactions (changing data field values or the state of a TCR), within a certain process step, is derived from the workflow depicting RNE’s business rules.

  > Note: In the case that two users work on the same TCR in the same time, and the first user saves his/her changes, the second user will receive the message after he/she tries to save their job.



- **Notes**
  Based on the user/roles concept, users can comment on a TCR or write their notes. In order to support a continuous commenting function, a user does not need to be the currently responsible editor of a TCR to write a comment. The displayed information of comment includes the subject, the content, a *Created at* date and a *Created by* indication. To avoid misunderstandings, a comment cannot be edited or deleted by the issuing user after the comment has been submitted. To provide a consistent notification about new comments to TCRs (e.g. comments from RUs to TCRs after publication), the following function will be implemented:
  - responsible IM personnel for TCRs are assigned to a configurable distribution list and will be notified via E-mail as soon as a new comment on a TCR of the respective IM has been submitted.
  - as soon as a user makes a comment to a TCR (e.g. a user of a RU), the respective user will automatically be informed via E-mail about every new comment on this particular TCR.

- **History**
  Each change of a TCR within its life cycle is logged and documented in the TCR-Tool. This includes the information about the activity (e.g. change of process steps), the field/s affected by the change (old values can be compared to new values), as well as the application user ("form change" → red marked 1 → e.g. result see red marked 2). Every change is marked with a timestamp to keep a complete history of all changes to a TCR. In addition, the position of the respective step in the process can be displayed including when an action has been taken, started, and finished. By default, the user's name and role in regard to action are displayed.

> Note: For privacy reasons, the name attribute is anonym and not be displayed to any role except for the administrator.

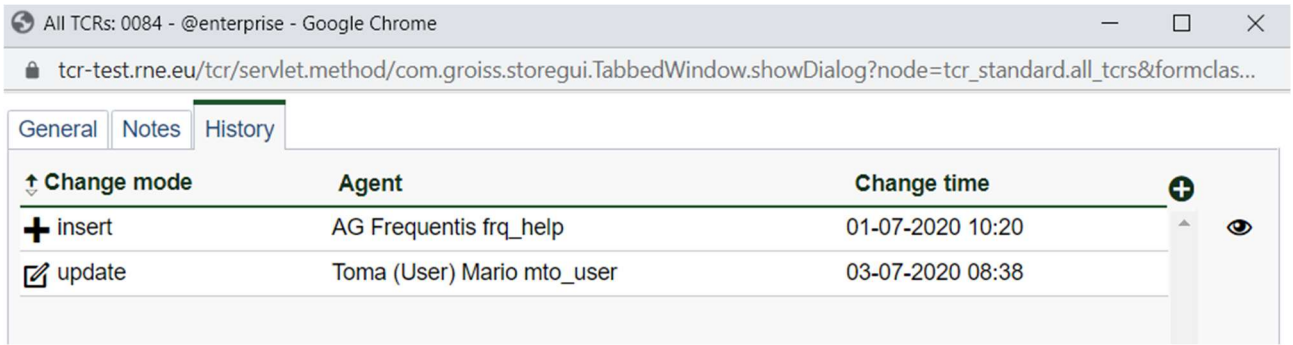


Figure 34 - History of TCR

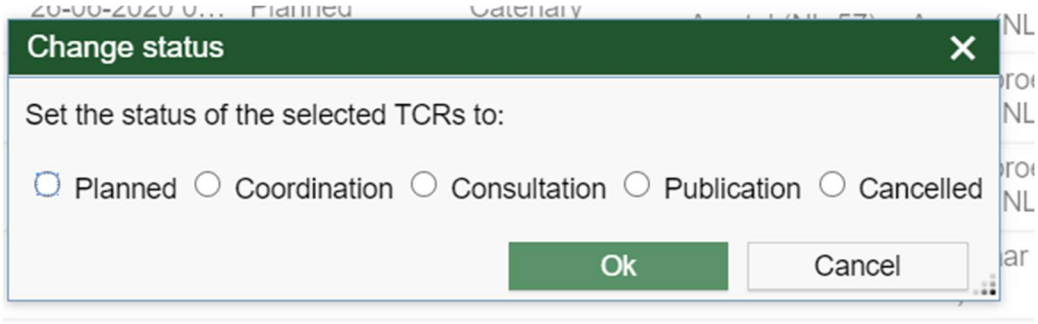
Also, TCR processes can be reactivated. In general, once a TCR is in the final state *Publication* its workflow process is finished. However, the issuing TCR creator is able to reactivate the TCR process (e.g. to make amendments).

Change the status

By selecting more TCRs, it is possible to change the status and classification for all of them at once.

The steps to change the status for all the selected TCRs are as follows:

1. Select the TCRs by hold the “CTRL” key on the keyboard and clicking with mouse each particular TCR in the list that you would like to select. It is also possible to select TCRs by hold “SHIFT” key on the keyboard and selecting all TCRs with mouse.
2. Click the “Change status” button after the selection is finished.
3. The “Change status” form is presented

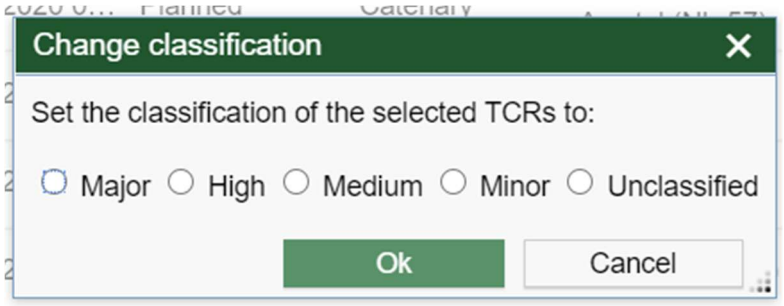


4. Select the appropriate status and press “OK” button
5. The status of the selected TCRs is changed to the matching status

Change the classification

The steps to change the status for all the selected TCRs are as follows:

1. Select the TCRs by hold the “CTRL” key on the keyboard and clicking with mouse each particular TCR in the list that you would like to select. It is also possible to select TCRs by hold “SHIFT” key on the keyboard and selecting all TCRs with mouse.
2. Click the “Change classification” button after the selection is finished.
3. The “Change classification” form is presented

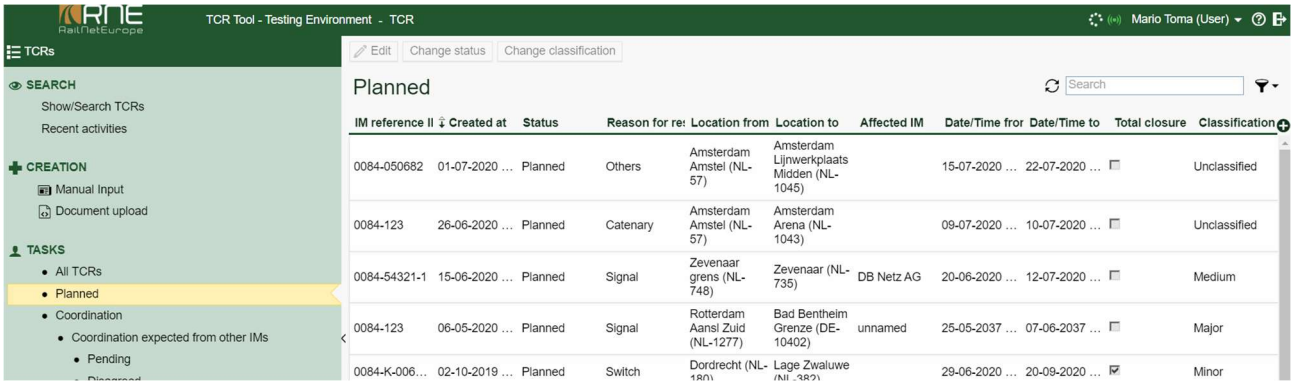


4. Select the appropriate classification and press “OK” button
5. The classification of the selected TCRs is changed to the matching classification

1.4.2. Planned

All the TCRs which status is “Planned” will be presented in this list. The TCRs in the status “Planned” are the TCRs that are national and will not be coordinated among the neighbours.

This list of TCRs in the “Planned” list is a subset of the TCRs that are presented in the “All TCRs” list. All the functionalities that were explained in the “All TCRs” topic, regarding work with TCR, filtering TCRs and so on, are applicable in this list as well.



1.4.3. Coordination

All the TCRs which status is “Coordination” will be presented in this list. The TCRs in the status “Coordination” are the TCRs that must be coordinated among the neighbours.

This list of TCRs is a subset of the TCRs that are presented in the “All TCRs” list. All the functionalities that were explained in the “All TCRs” topic, regarding work with TCRs, are applicable in this list as well.

The “Coordination” list has two major parts:

- Coordination expected from other IMs
- Coordination expected from my IM

Coordination expected from other IMs

All the TCRs from own organization of the logged-in user, that should be coordinated with the involved IMs, are presented in the list.

Besides, the list contains sub lists to easier checking the progress of the coordination from neighbouring IMs:

Pending – the list of all TCRs that are not evaluated yet from the involved IMs

Disagreed – the list of all TCRs that involved IMs assessed, and at least one of them answers disagree

Agreed - the list of all TCRs that involved IMs assess agree

It is possible to check all answers that were provided from the neighbouring IMs, together with their comments or requests.

Coordination expected from my IM

All the TCRs from the neighbouring IMs, that own organization has to assess will be presented in this list.

By double-clicking, the details of the TCR are opened and the user can assess TCR by changing the status under “Affected IM” its company name to Agreed, Disagreed or Pending and enter some comments or suggestions in the textbox below the company’s name (*figure 35*).

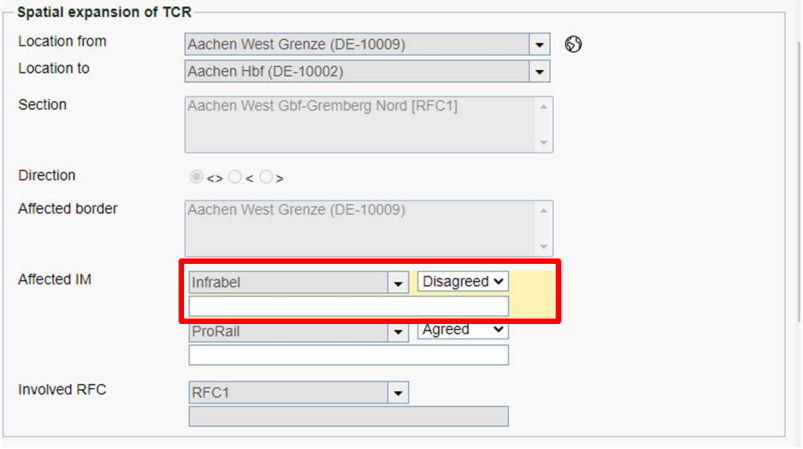


Figure 35 – Assess the TCR

After changing the status to agree/disagree/pending, and entering the comment, the TCR should be saved. With that, the work of assessing the TCR is done.

1.4.4. Consultation

All the TCRs that should be discussed with the RUs, are presented in this list. The RUs can see the TCR details and make their comments.

> This functionality will not be tested in this year, according to the request from the TCR Tool core team and TCR Tool WG groups.

1.4.5. Publication

The “Publication” status means that TCRs are finalized and will be published when the deadlines are approaching according to the Anney VII deadlines. All the TCRs of the own company that are in “Publication” status are presented in this list.

The TCR from this list could be changed to “Planned” or “Coordination” status or even cancelled, but this must be done manually.

1.5. Reports

The fourth group of functions is related to the report and subscription possibilities to work with the TCRs. Users can execute different reports and subscribe to the reports to receive a notification to email.

In this group two functions can be chosen:

- List of reports
- Report Subscription

1.5.1. List of reports

Export TCRs

In a case that it is needed to export TCRs, users can use the “List of reports” function under “Reports” section on the left menu.

Opening and executing the “Map report”, users will get the list of all TCRs.

By clicking at the “Export Options” button on the top of the form, a form with the export options opens and it is possible to define a needed export format.

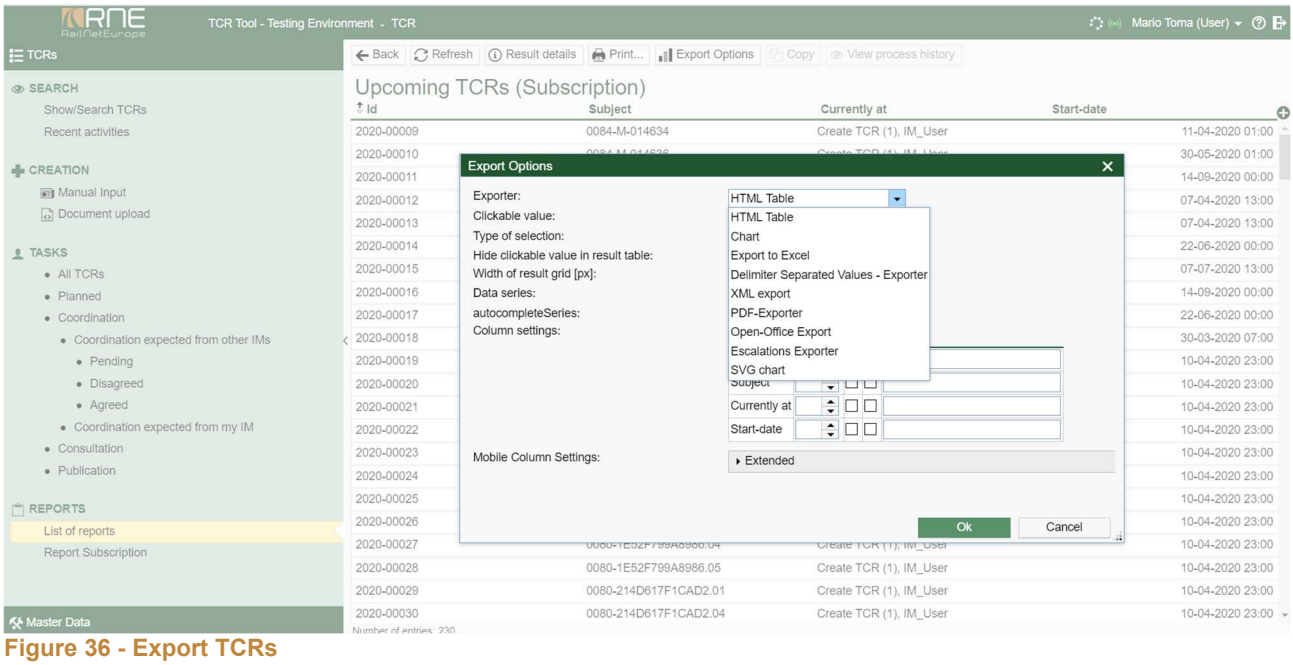


Figure 36 - Export TCRs

Reporting and notification

The TCR-Tool provides various types of reports for users in order to work as a comprehensive information source. Attributes (e.g. used in the TCR-form for manually creating TCRs) can be related to each other allowing for generating different reports. These reports can be freely configured by the **Administrator** allowing of meeting the user's demands for individual TCR information. Users are able to run reports according to the rights of their role. Results for reports can be displayed in the output formats such as HTML table, Exports to Excel or PDF-exports. Furthermore, users can subscribe to these reports and define an interval, which shall be used for notifying in a periodic manner.

For instance, the Administrator can configure reports for

- number of updated TCRs (sum and average) in relation to the final publication
- number of coordination's (sum and average) per RFC
- number of operating users (sum and average) per day/week/month
- number of TCRs (sum and average) per reason for restriction
- timespan (sum and average) per TCR for a specific section
    - number of TCRs (sum and average) with a specific state
    - timespan (sum and average) in which a TCR stays in a certain state

1.5.2. Notifications

1.5.2.1. Notify concerned partners about edited TCRs

The system automatically notifies affected IMs about edited TCRs, which have already been successfully coordinated between IMs.

1.5.2.2. Notify concerned partners about cancelled TCRs

The system automatically notifies affected IMs about cancelled TCRs, which have already been successfully coordinated between IMs

1.5.2.3. Notify concerned RUs after publication

The system automatically notifies RUs and interested parties about notes added to a TCR if they are registered and assigned to the service.

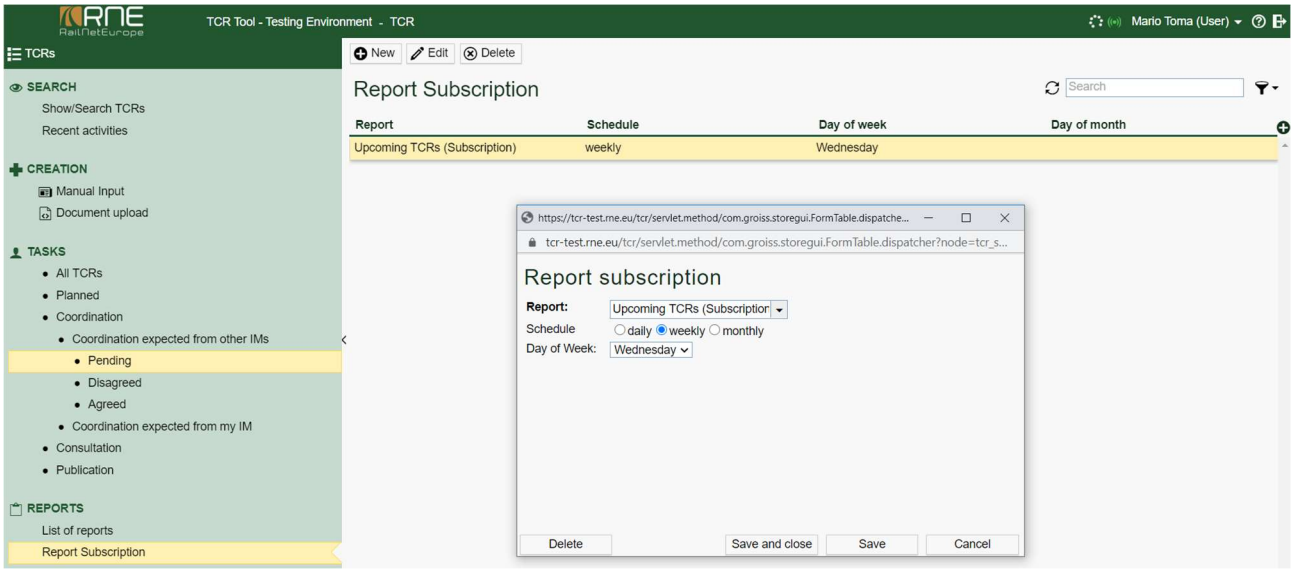
1.5.2.4. Report subscription

Users can subscribe to pre-defined reports. The following steps show how a user can subscribe.

1.) Via the navigation menu select "Report Subscription". The "Report Subscription" is opened.
2.) Click on "New". A new browser window to configure a report subscription is opened.
3.) Check the presentation of the browser window. The following fields are displayed:
    - a combo box to select a defined report
    - radio buttons to define the interval of the report sendings. The user is able to select the following intervals:
    - daily
    - weekly

- monthly
- Insert button
- Cancel button

4.) Select the interval
5.) Select the report mentioned in the precondition from the combo box for “Report”.
6.) Click on the “Insert” button. The browser window has been closed and the selected report subscription is displayed with the according to schedule value in the “Report Subscription” list.



2. Administration

The administration allows the configuration of various data required for the operation of the TCRTool.

This includes managing users/roles and their permissions, languages as well as attributes of fields.

2.1.1. User/Roles concept

The TCR-Tool allows the configuration of application users. Users can be assigned to different roles, which have different application rights. Detailed information can be found in the following subsections.

2.1.1.1. Hierarchical structure

The hierarchical structure in the TCR-Tool is based on organizational units, roles and users. Each organizational unit can have up to n sub-organisational units (e.g. multiple IMs and RUs within a country) assigned. Furthermore, users can exercise up to n roles within an organisational unit. To
depict RNE's and its member's business logic, the structure is shown in Figure 3 is outlined.

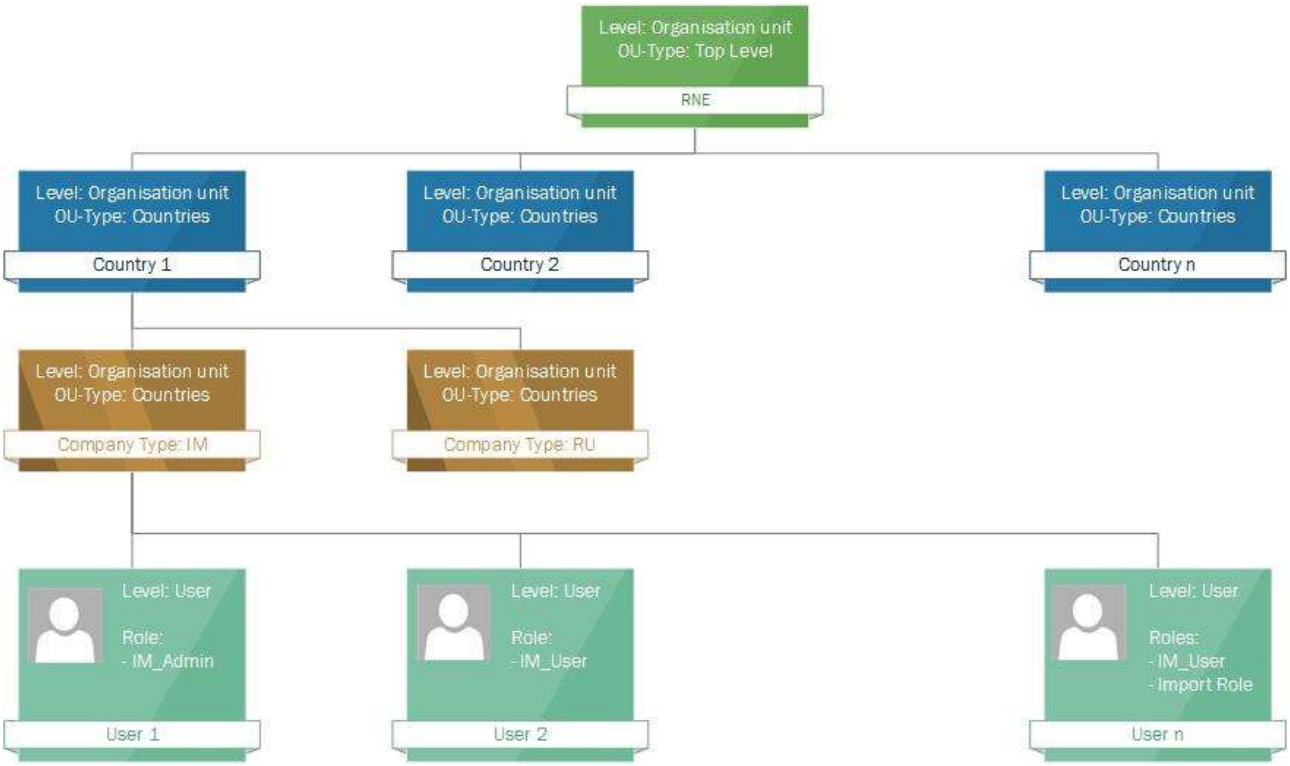


Figure 37 - Hierarchical structure of a user management

- A user with the Administrator role creates countries on the organisational unit level.
- An additional country administrator is assigned for each country and defines companies (IMs, RUs, allocation bodies, etc.), which operate on a national level. Also, a country-specific UIC-

Code 920-14 (80 Germany, 81 Austria, 84 Netherlands, etc.) can be mapped to a country. This UIC-Code is automatically linked to
  - the IM reference ID (ensuring to keep a unique ID in the database),
  - the locations assigned to the country (only locations of the respective country are shown and selectable),
  - the longitude/latitude coordinates for the GIS-map (upon opening the GIS-viewer, the picture section focuses on the respective country).
- Company administrators (e.g. *IM_Admin* role) are responsible for the creation of users and the assignment of an arbitrary amount of roles to them.

2.1.1.2. Configuration of roles

For each role, specific rules/permissions regarding read/write options and visibilities can be configured to support the desired configuration of user/roles variations. The TCR-Tool will be implemented with the roles and the according to permissions as shown in the table below.

	Create/Change/Modify TCRs		Import	Read TCRs			Cancel		Comment	
				not published		published			not published	published
Roles	any TCR	any TCR from my IM	my IM TCR	Read my TCRs	Read all TCRs	Read all TCRs	any TCR	any TCR from my IM		
Administrator	YES	YES	YES	YES	YES	YES	YES	YES	NO	NO
IM_ADMIN	NO	YES	NO	YES	YES	YES	NO	YES	NO	NO
IM_USER	NO	YES	NO	YES	YES	YES	NO	YES	NO	NO
RU_ADMIN	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO
RU_USER	NO	NO	NO	NO	NO	YES	NO	NO	NO	YES
Front end view	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO
Import role	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO
RFC Coordinator	NO	NO	NO	YES	YES	YES	NO	NO	YES	YES

Table 7 - User/Roles matrix to be implemented

As shown in the table above, each role has its own set of permissions. If a user has assigned multiple roles, the overall permission for this user derives from the sum of the partial permissions.

For instance, and according to Table 6, a user with the assigned roles *IM_User* and Import role has every permission of the *IM_User* role and besides, the user is also able to import TCRs of the own IM.

2.1.2. Creation of user and application of roles

To create users or modify user-roles it is necessary to be logged in with administrative rights. The cockpit view will be slightly different when logging in as an administrator. A new icon shall be visible (red marked - 1).

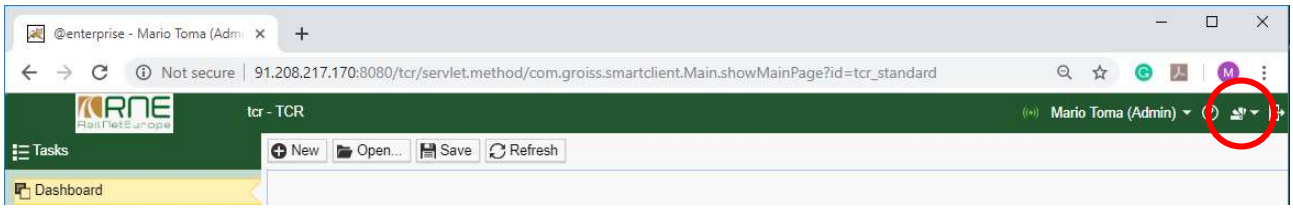
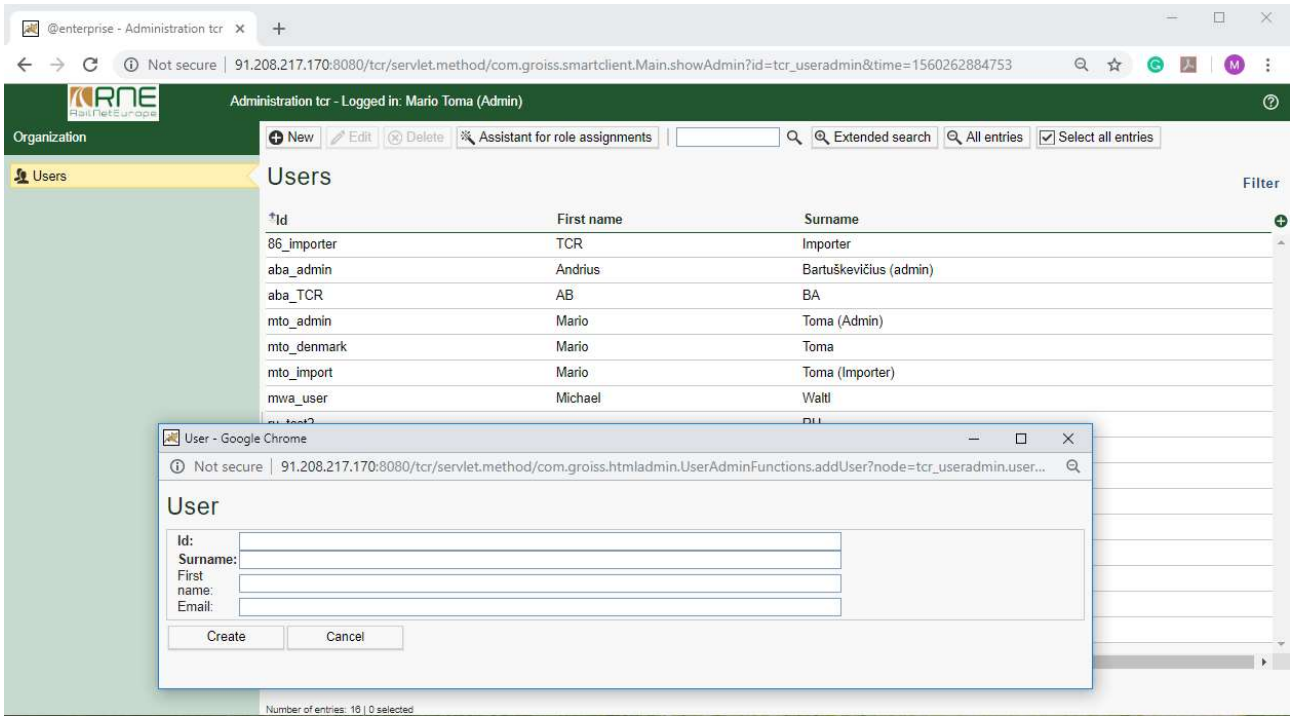


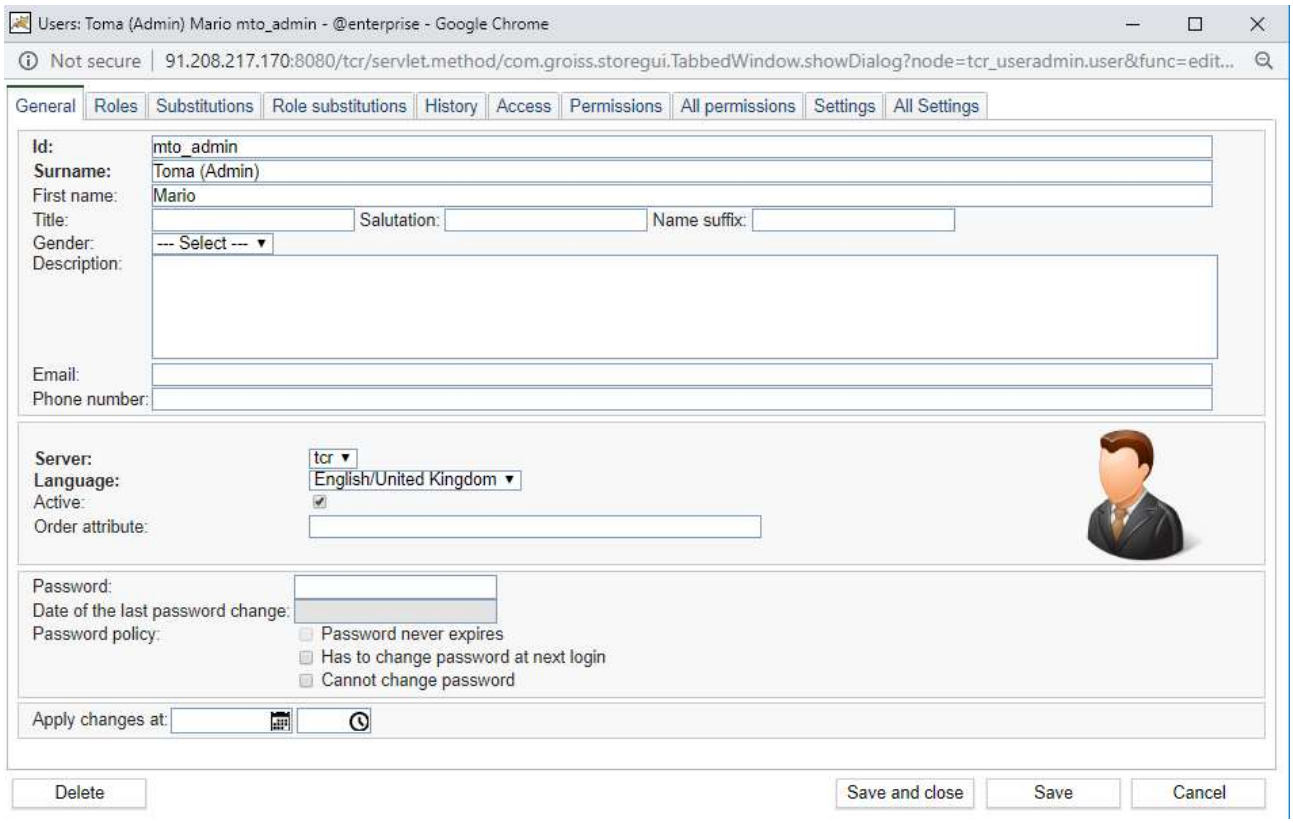
Figure 38 - Admin icon

To create a new user following steps must be taken:

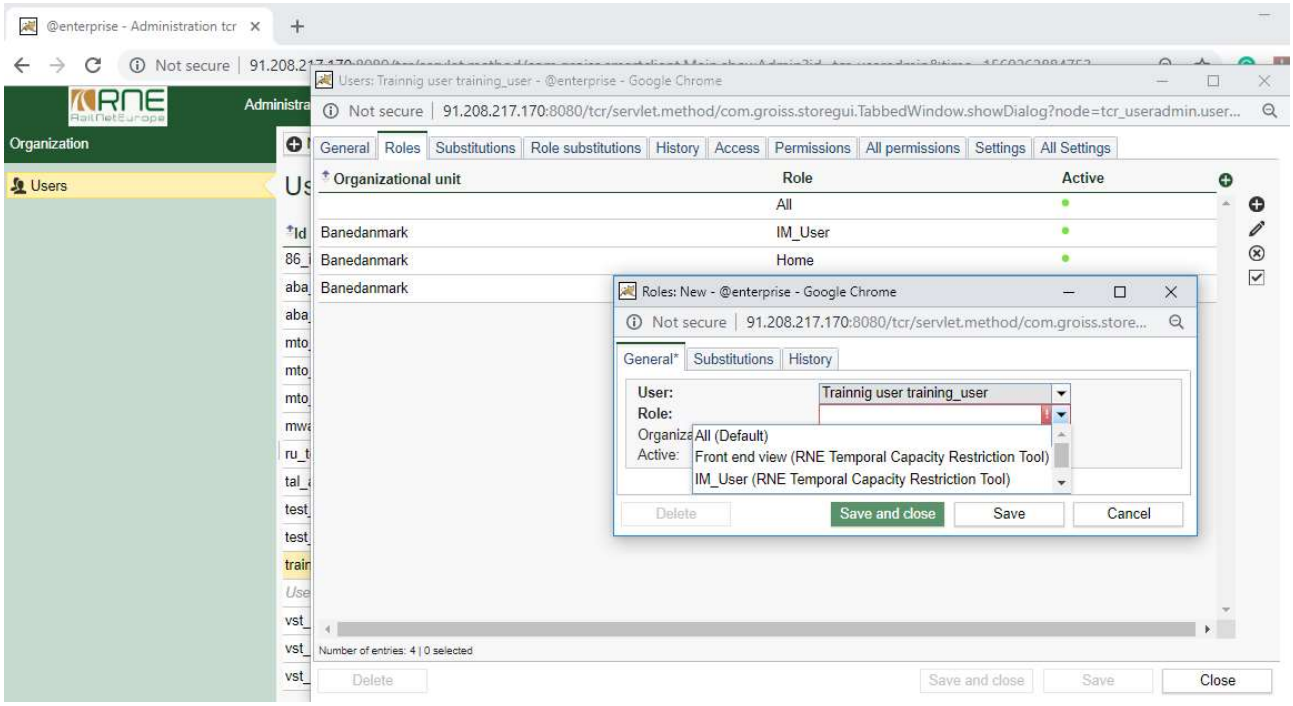
1.) Click the Admin icon (*Figure 4*)
2.) Select "*User admin*"
3.) Log in with "*Admin*" credentials a second time
4.) Select under "*Organization*" the link "*Users*"
5.) The list of users shall be shown.
6.) Click "*New*" in the action section. A new window shall open



7.) Enter user credentials and click on "*create*" – the window changes its view.



8.) Now the general information can be inserted.
9.) Next step is to assign the roles. Therefore select the "*Roles*" tab and further click on "+"(1) to open the respective menu.



10.) A new window opens and the respective role and the organisational unit can be selected.
11.) Finish this step by click on "*Apply*" in the right corner at the end. Several roles can be added just to repeat the above-mentioned steps.

3. TCR Webtool V2.0- Technical Manual

3.1. Technical requirements

TCR tool is a web-based application and does not have any direct hardware requirements. The application can be used on many operating systems and with various web browsers.

For the best user experience, the TCR tool strongly recommends using a display with minimum screen resolution 1024*768 pixels or better. Recommended web browser is Chrome.

3.2. TCR master data management

The TCRs can be imported into TCR tool in two different ways: via Excel file or XML file, what is already explained in the chapter.

Additionally, import via XML file can be done via manual XML import file (like excel import) or a web-service. The XML structure will be validated on upload, and an appropriate status report is displayed. Besides, the import routine will validate if the user is authorised to create a new TCR (factoring in the provided transactional data) and if there are consistency issues with related master data. The import stores only data in the TCR tool, if no validation or consistency errors occur. In case of errors, the TCR tool responds with a detailed error report.

Descriptions of the excel and XML file structure (interface) are below.

3.3. Specification of .xls interface

The excel file used for importing TCRs needs to follow a predefined structure. The overview of this structure can be seen in Appendix 2 of this document.

The excel file to be imported must fulfil the following rules:

- The TCR is on the **2nd sheet**
- The TCR definitions start from the **4th row**

The columns in the Excel sheet must be used as defined below. Note that only columns relevant for the import are listed. The table has the following structure:

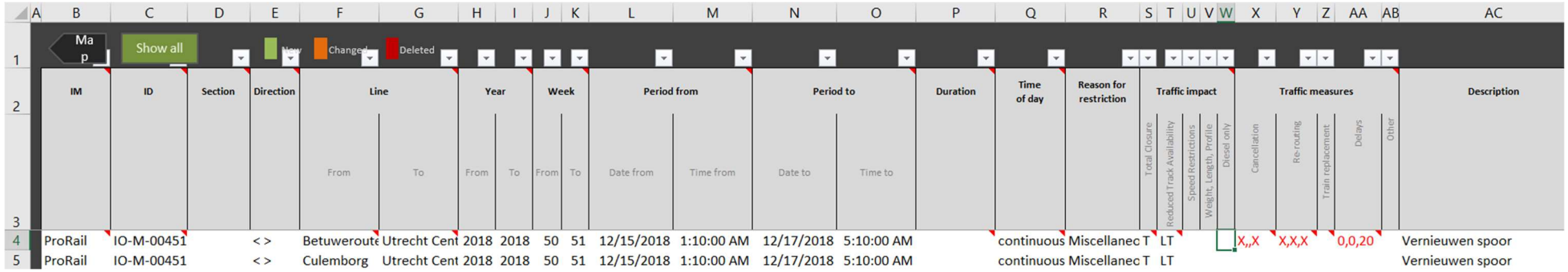
- Column – Column identifier in the Excel file
- Interpretation – Meaning of the column (form the Header row)
- Allowed type– The type of the column
- Constraints / Values – Rules that will be validated during the import and predefined values in the excel. Mandatory fields are marked with *Not null.*
- Mapping – The name of the field of the TCR form into which the value of the column will be mapped

Column	Interpretation	Allowed type	Constraints / Values	Mapping
B	IM	Text	Not null; Value must match the name of an Organisation Units defined in the TCR-Tool	IM (Organisation Unit)
C	ID	Text	Not Null; The combination IM (column B) together with ID (column C) must be unique	Reference ID
D	Section	Text	Not Null; Value must match the section which is computed from the fields ‘Location From’ and ‘Location To’	*Not mapped*

E	Direction	Text	Not null; Value must be in [<, >, <>]	Direction
F	From Location	Text	Not Null; Value must match a Location stored in the TCR Tool topology data	Location from
G	To Location	Text	if null, then the interpretation is that 'To Location' is the same as 'From Location' if not null, the value must match a Location stored in the TCR Tool topology data	Location to
H	Year From	Number	Not null	Year From
I	Year To	Number	Not Null; Must be >= Year From (Column H)	Year To
J	Week From	Number	Not null; Value must be in [1-52]	Week From
K	Week To	Number	Not null; Value must be in [1-52]	Week To
L	Date From	Date	If not null, the date must be in the calendar week as defined by Year From and Week From	Date/Time From
M	Time From	Time	If not null, then also Date From must be not null; If null and Date From is not null, Time From is interpreted as 00:00	Date/Time From
N	Date To	Date	If not null, then also Date From must be not null; shall be equal or later than Date From	Date/Time To
O	Time To	Time	If not null, then also Date To must be not null; If null and Date To is not null, Time To is interpreted as 23:00	Date/Time To
P	Duration	Text	-	Duration
Q	Time of day	Text	Not null; Value must be in [continuous, periodical, periodical continuous]	Type of TCR
R	Reason of restriction	Text	-; Value must be in Signal; Switch; Catenary; Track & Rail; Tunnel; Bridge; Miscellaneous*; Maintenance, Others**]	Reason of restriction
S	Total Closure	Text	-; Value must be in [X]	Total Closure (true if value = X)
T	Reduced Track Availability	Text	-; Value must be in [LT, ST, LT+ST]	Reduced Track Availability LT (true if value in [LT; LT+ST]) Reduced Track Availability ST (true if value in [ST; LT+ST])
U	Speed Restrictions	Text	-; Value must be in [X]	Speed Restrictions (true if value = X)
V	Weight, Length, Profile	Text	-; Value must be in [W; L; P; W+L; W+P; L+P; W+L+P]	Weight (true if value in [W; W+L; W+P; W+L+P]) Length (true if value in [L; W+L; L+P; W+L+P]) Profile (true if value in [P; W+P; L+P; W+L+P])
W	No catenary (ex Diesel only)	Text	-; Value must be in [X]	No catenary (true if value = X)
X	Cancellation	Text	-; Value must be in [X], comma-separated (for the freight trains, long-distance trains and short-distance trains) e.g. [**X,,X**] applies to freight and short-distance trains	Cancellation Freight trains (true if value X)
Y	Re-routing	Text	-; Value must be in [X], comma-separated (for the freight trains, long-distance trains and short-distance trains) e.g. [**X,,X**] applies to freight and short-distance trains	Re-routing Freight trains (true if value = X)
Z	Train replacement	Text	-; Value must be in [X], comma-separated (for the freight trains, long-distance trains and short-distance trains) e.g. [**X,,X**] applies to freight and short-distance trains	Train replacement Freight trains (true if value = X)
AA	Delays	Text	-; Value must be in [D, X, or positive integers]	Estimated delays (true if value not null) Define delay minutes (if value represents a positive integer)
AB	Other	Text	-	Other
AC	Description	Text	-	Description
AD	International coordination	Text	-	International coordination
AE	In yearly timetable	Text	-	In annual timetable (mapping TBD: proposal to change allowed values to [Y] or [Y; N]
AF	IM project ID	Text	-	IM Project ID

AG	Last update	Datetime	-	Data status
AH	Classification	Text	Not null; Value must be in [Major; High; Medium; Minor; Unclassified]	Classification
AI	Weekdays	Text	-; Working days comma-separated-values, from 1-7 starting with Monday (1), Tuesday (2)…	Working Days
AJ	Interval	Number	-; Values must be in 1-5 (Defines weekly interval of planned works)	Weekly interval
AK	Affected estimated travel volume	Number	-	Affected estimated travel volume
AL	Affected border	Text	-; PLC codes of the affected border locations (in the case of more borders, they must be comma-separated)	Affected border
AM	Deviation location	Text	-; comma-separated location PLCs on the deviation route	Deviation location
AN	Deviation border	Text	-; comma-separated border PLCs	Deviation border
AO	Status	Text	If null the value will be calculated in the tool considering GeoEditor coordination parameter; Value must be in [Planned, Coordination, Consultation, Published, Canceled or empty]	If null (empty) it will be set according to the import logic and GeoEditor parameter; Status
AP	Additional information	Text	-; Currently will not be used	-
AQ	Automatic process	Text	If yes, then automatic publication in the tool will start, according to Annex VII deadlines. The value must be in [Y; N]	Automatic process

3.4. Excel structure



IM	ID	Section	Direction	Line		Year		Week		Period from		Period to		Duration	Time of day	Reason for restriction	Traffic impact				Traffic measures					Description
				From	To	From	To	From	To	Date from	Time from	Date to	Time to				Total Closure	Reduced Track Availability	Speed Restrictions	Weight, Length, Profile	Diesel only	Cancellation	Re-routing	Train replacement	Delays	Other	
ProRail	IO-M-00451		< >	Betuweroute	Utrecht Cent	2018	2018	50	51	12/15/2018	1:10:00 AM	12/17/2018	5:10:00 AM		continuous	Miscellanec T	LT	LT			X,,X	X,X,X		0,0,20		Vernieuwen spoor
ProRail	IO-M-00451		< >	Culemborg	Utrecht Cent	2018	2018	50	51	12/15/2018	1:10:00 AM	12/17/2018	5:10:00 AM		continuous	Miscellanec T	LT	LT								Vernieuwen spoor

International coordination	In yearly timetable	IM Project ID (Optional)	Last update	Classification	Weekdays	Interval	Affected estimated travel volume	Affected border	Deviation location	Deviation border	Status	Additional information	Automatic process
80,85	Y		10/8/2018	Major	1,3	2			99960,621		Planned	N	
	Y		10/8/2018	Minor	1,2,3,4,5,6,7	1					Coordination	Y	

3.5. Specification of .xml interface

```
<?xml version="1.0" encoding="UTF-8"?>
<!--Sample XML file generated by XMLSpy v2019 rel. 3 sp1 (x64) (http://www.altova.com)-
->
<xs:TCRMessage xmlns:xs="http://taf-jsg.info/schemes"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://taf-
jsg.info/schemes 21.04.2020%20-%20taf%20ttr%20schema_proposal_new.xsd">
	<xs:MessageHeader>
		<xs:MessageReference>
			<xs:MessageType>1</xs:MessageType>
			<xs:MessageTypeVersion>a</xs:MessageTypeVersion>
			<xs:MessageIdentifier>a</xs:MessageIdentifier>
			<xs:MessageDateTime>2001-12-17T09:30:47Z</xs:MessageDateTime>
		</xs:MessageReference>
		<xs:MessageRoutingID>1</xs:MessageRoutingID>
		<xs:SenderReference>a</xs:SenderReference>
		<xs:Sender>1</xs:Sender>
		<xs:Recipient>1</xs:Recipient>
	</xs:MessageHeader>
	<xs:AdministrativeContactInformation>
		<xs:Name>a</xs:Name>
		<xs:Address>a</xs:Address>
		<xs:eMail>a</xs:eMail>
		<xs:PhoneNumber>a</xs:PhoneNumber>
		<xs:FaxNumber>a</xs:FaxNumber>
		<xs:FreeTextField>a</xs:FreeTextField>
	</xs:AdministrativeContactInformation>
	<xs:TCRID>
		<xs:ObjectType>TC</xs:ObjectType>
		<xs:Company>1</xs:Company>
		<xs:Core>**********</xs:Core>
		<xs:Variant>00</xs:Variant>
		<xs:TimetableYear>2012</xs:TimetableYear>
		<xs:StartDate>1957-08-13</xs:StartDate>
	</xs:TCRID>
	<xs:CoordinatingIM>1</xs:CoordinatingIM>
	<xs:TCR>
		<xs:ReasonForRestriction>90</xs:ReasonForRestriction>
		<xs:Description>String</xs:Description>
		<xs:StartLocation>
			<xs:CountryCodeISO>aa</xs:CountryCodeISO>
			<xs:LocationPrimaryCode>1</xs:LocationPrimaryCode>
			<xs:PrimaryLocationName>a</xs:PrimaryLocationName>
		</xs:StartLocation>
		<xs:EndLocation>
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		</xs:EndLocation>
		<xs:Sections>
			<xs:Section>
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					<xs:LocationPrimaryCode>1</xs:LocationPrimaryCode>
					<xs:PrimaryLocationName>a</xs:PrimaryLocationName>
				</xs:StartLocation>
				<xs:EndLocation>
```

```
                                    <xs:CountryCodeISO>aa</xs:CountryCodeISO>
                                    <xs:LocationPrimaryCode>1</xs:LocationPrimaryCode>
                                    <xs:PrimaryLocationName>a</xs:PrimaryLocationName>
                              </xs:EndLocation>
                              <xs:Name>a</xs:Name>
                        </xs:Section>
                  </xs:Sections>
                  <xs:TCRDirection>20</xs:TCRDirection>
                  <xs:AffectedBorders>
                        <xs:AffectedBorder>
                              <xs:CountryCodeISO>aa</xs:CountryCodeISO>
                              <xs:LocationPrimaryCode>1</xs:LocationPrimaryCode>
                              <xs:PrimaryLocationName>a</xs:PrimaryLocationName>
                        </xs:AffectedBorder>
                  </xs:AffectedBorders>
                  <xs:AffectedIMs>
                        <xs:AffectedIM>
                              <xs:CompanyCode>1</xs:CompanyCode>
                              <xs:CompanyName>a</xs:CompanyName>
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                              <xs:CoordinationComment>String</xs:CoordinationComment>
                        </xs:AffectedIM>
                  </xs:AffectedIMs>
                  <xs:InvolvedICE>
                        <xs:InvolvedICE>
                              <xs:ICEName>a</xs:ICEName>
                              <xs:Recommendation>true</xs:Recommendation>
                              <xs:Comments>String</xs:Comments>
                        </xs:InvolvedICE>
                  </xs:InvolvedICE>
                  <xs:TemporalExpansion xs:ExpansionType="PERIODICAL">
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                              <xs:BitmapDays>0</xs:BitmapDays>
                              <xs:ValidityPeriod>
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17T09:30:47Z</xs:StartDateTime>
                                    <xs:EndDateTime>2001-12-17T09:30:47Z</xs:EndDateTime>
                              </xs:ValidityPeriod>
                        </xs:PlannedCalendar>
                        <!-- OR
                        <xs:RoughDates>
                              <xs:StartYear>2001</xs:StartYear>
                              <xs:StartWeek>1</xs:StartWeek>
                              <xs:EndYear>2001</xs:EndYear>
                              <xs:EndWeek>2</xs:EndWeek>
                        </xs:RoughDates>
                        <xs:BitmapDays>0000000</xs:BitmapDays>
                        -->
                        <xs:TCRTimeAtLocation xs:TCRTimeQualifier="ALL_LOCATIONS">  <!--
will be implemented in 2021 -->
                              <xs:StartTime>
                                    <xs:Time>09:30:47+05:00</xs:Time>
                                    <xs:Offset>0</xs:Offset>
                              </xs:StartTime>
                              <xs:EndTime>
                                    <xs:Time>09:30:47+05:00</xs:Time>
                                    <xs:Offset>0</xs:Offset>
                              </xs:EndTime>
                        </xs:TCRTimeAtLocation>
```

```
                    <xs:WeeklyPattern>0000000</xs:WeeklyPattern>    <!-- will be
implemented in 2021 -->
                    <xs:WeeklyInterval>2</xs:WeeklyInterval>
              </xs:TemporalExpansion>
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                    <xs:ReducedTrackAvailability LT="true" ST="true"/>
                    <xs:DimensionalRestriction weigth="true" length="true"
profile="true"/>
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                    <xs:SpeedRestriction>true</xs:SpeedRestriction>
                    <xs:NoCatenary>true</xs:NoCatenary>
                    <xs:AffectedTrafficVolume>0</xs:AffectedTrafficVolume>
                    <xs:TCRClassification>20</xs:TCRClassification>
                    <xs:TrafficMeasures>
                          <xs:Cancellation>
                                <xs:TCRMeasures>10</xs:TCRMeasures>
                                <xs:Value>true</xs:Value>
                          </xs:Cancellation>
                          <xs:ReRouting>
                                <xs:TCRMeasures>30</xs:TCRMeasures>
                                <xs:Value>true</xs:Value>
                          </xs:ReRouting>
                          <xs:Replacement>
                                <xs:TCRMeasures>30</xs:TCRMeasures>
                                <xs:Value>true</xs:Value>
                          </xs:Replacement>
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                                <xs:Value>2</xs:Value>
                          </xs:EstimatedDelay>
                    </xs:TrafficMeasures>
                    <xs:Deviations>
                          <xs:Routes>
                                <xs:DeviationLocation>
                                      <xs:CountryCodeISO>aa</xs:CountryCodeISO>

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      <xs:PrimaryLocationName>a</xs:PrimaryLocationName>
                                </xs:DeviationLocation>
                                <xs:DeviationComment>String</xs:DeviationComment>
                          </xs:Routes>
                          <xs:Borders>
                                <xs:DeviationBorder>
                                      <xs:CountryCodeISO>aa</xs:CountryCodeISO>

      <xs:LocationPrimaryCode>1</xs:LocationPrimaryCode>

      <xs:PrimaryLocationName>a</xs:PrimaryLocationName>
                                </xs:DeviationBorder>
                          </xs:Borders>
                    </xs:Deviations>
                    <xs:InternationalCoordination>String</xs:InternationalCoordination>
                    <xs:InYearlyTimetable>true</xs:InYearlyTimetable>
                    <xs:IndicationOfTimetableAdaption>1957-08-
13</xs:IndicationOfTimetableAdaption>
              </xs:OperationalConsequenes>
              <xs:ProjectID>String</xs:ProjectID>
              <xs:TCRStatus>20</xs:TCRStatus>
              <xs:LastUpdated>2001-12-17T09:30:47Z</xs:LastUpdated>
```

```
            <xs:AutomaticProcess>true</xs:AutomaticProcess>
        </xs:TCR>
</xs:TCRMessage>
            <xs:element name="TrafficMeasures" type="TrafficMeasuresType"
minOccurs="0"/>
            <xs:element name="DeviationLocations" type="DeviationLocationsType"
minOccurs="0"/>
            <xs:element name="DeviationBorders" type="DeviationBordersType"
minOccurs="0"/>
            <xs:element name="DeviationComment" type="xs:string" minOccurs="0"/>
            <xs:element name="InternationalCoordinationComment" type="xs:string"
minOccurs="0"/>
            <xs:element name="InYearlyTimetable" type="xs:boolean"/>
            <xs:element name="IndicationOfTimetableAdaption" type="xs:date"
minOccurs="0"/>
        </xs:sequence>
    </xs:complexType>
    <xs:complexType name="TrafficMeasuresType">
        <xs:sequence>
            <xs:element name="Cancellation" type="TrainTypeType" minOccurs="0"/>
            <xs:element name="ReRouting" type="TrainTypeType" minOccurs="0"/>
            <xs:element name="Replacement" type="TrainTypeType" minOccurs="0"/>
            <xs:element name="Delay" type="TrainTypeType" minOccurs="0"/>
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    <xs:complexType name="TrainTypeType">
        <xs:attribute name="freight" type="xs:boolean" use="optional"/>
        <xs:attribute name="longDistance" type="xs:boolean" use="optional"/>
        <xs:attribute name="shortDistance" type="xs:boolean" use="optional"/>
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    </xs:complexType>
    <xs:complexType name="DelayType">
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        <xs:attribute name="longDistance" type="xs:positiveInteger"
use="optional"/>
        <xs:attribute name="shortDistance" type="xs:positiveInteger"
use="optional"/>
        <xs:attribute name="commuter" type="xs:positiveInteger" use="optional"/>
    </xs:complexType>
    <xs:complexType name="DeviationLocationsType">
        <xs:sequence>
            <xs:element name="DeviationLocation" type="taf:LocationIdent"
minOccurs="1" maxOccurs="unbounded"/>
        </xs:sequence>
    </xs:complexType>
    <xs:complexType name="DeviationBordersType">
        <xs:sequence>
            <xs:element name="DeviationBorders" type="taf:LocationIdent"
minOccurs="1" maxOccurs="unbounded"/>
        </xs:sequence>
    </xs:complexType>
</xs:schema>
```