EUROPEAN UNION AGENCY FOR RAILWAYS

Making the railway system work better for society.

System Proposal for COR Safety Management Data

COMMON OCCURRENCE REPORTING PROJECT

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Version	*Date*	*Comments*
1.0	23/11/2017	First draft version for external consultation
2.0	16/05/2018	Second version after external consultation

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2.1. Reference Documents

Table 1 Table of Reference Documents

[Ref. N°]	*Title*	*Reference*	*Version*
[1]	Directive (EU) 2016/798 of the European Parliament and of the Council of 11 May 2016 on railway safety (recast)	2016/798	OJ: L138/102 of 26/05/2016
[2]	Directive (EU) 2016/797 of the European Parliament and of the Council of 11 May 2016 on the interoperability of the rail system within the European Union (recast)	2016/797	OJ: L138/44 of 26/05/2016
[3]	Directive 2008/68/EC of the European Parliament and of the Council of 24 September 2008 on the inland transport of dangerous goods (Text with EEA relevance)	2008/68	As amended by 2016/2309
[4]	Commission Directive (EU) 2016/2309 of 16 December 2016 adapting for the fourth time the Annexes to Directive 2008/68/EC of the European Parliament and of the Council on the inland transport of dangerous goods to scientific and technical progress (Text with EEA relevance)	2016/2309	OJ L 345, 20.12.2016
[5]	Regulation (EU) 2016/796 of the European Parliament and of the Council of 11 May 2016 on the European Union Agency for Railways and repealing Regulation (EC) N° 881/2004	2016/796	OJ: L138 of 26/05/2016
[6]	Commission Regulation (EU) No 1078/2012 of 16 November 2012 on the common safety method for monitoring to be applied by railway undertakings, infrastructure managers after receiving a safety certificate or safety authorisation and entities in charge of maintenance	1078/2012	OJ: L320/8 of 17/11/2012
[7]	COR project plan	Project Plan ERA-PRG--004	V2.0
[8]	Commission Regulation (EU) No 376/2014 of the European Parliament and of the Council on the reporting, analysis and follow-up of occurrences in civil aviation	376/2014	OJ L 122, 24.4.2014, p. 18–43
[9]	DNV study Assessment of Existing National Occurrence Reporting Regimes and Systems	1LDI90Z-12	Task 1, Rev. 2
[10]	Commission Regulation (EU) No 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation)	2016/679	OJ L119/1 of 4/5/2016

2.2. Definitions and Abbreviations

2.2.1. Standard Terms and Abbreviations

The general terms and abbreviations used in the present document can be found in a standard dictionary. Furthermore, a glossary of railway terms that focuses primarily on safety and interoperability terminology, but also on other areas that the Agency can use in its day-to-day activities as well as in its Workgroups for the development of future publications, is available on the Agency website.

2.2.2. Specific Terms and Abbreviations

Table 2 Table of Terms

Term	*Definition*
Agency	The European Union Agency for Railways such as established by the Regulation (EU) No 2016/796 of the European Parliament and of the Council of 11 May 2016
Anonymisation	the removal from occurrence reports of all personal details relating to the reporter and to the persons mentioned in occurrence reports and any details, including the name of the organisation(s) involved in the occurrence, which may reveal the identity of the reporter or of a third party or lead to that information being inferred from the occurrence report;
Employee or contractor	Any person whose employment is in connection with a railway and is at work at the time of the accident, incident or near miss including the staff of contractors, self-employed contractors, the crew of the train and persons handling rolling stock and infrastructure installations
Hazard	A condition that could lead to an accident (Art.3. (13) Of Regulation (EU) 402/2013 – CSM for Risk Assessment).
Interested party	any natural or legal person or any official body, whether or not having its own legal personality, that is in a position to participate in the improvement of railway safety by having access to information on occurrences exchanged by the Member States and which falls within one of the categories of interested parties set out in Annex IV;
Just culture	A culture in which front-line operators or other persons are not punished for actions, omissions or decisions taken by them that are commensurate with their experience and training, but in which gross negligence, wilful violations and destructive acts are not tolerated;
Occurrence	Occurrence means any safety-related event which endangers or which, if not corrected or addressed, could endanger a train or any rolling stock, its passengers, staff or any other person, and includes in particular an accident and incident.
point of contact	(a) where a request for information is made by an interested party established in a Member State, the national reporting authority designated by each Member State in accordance with paragraph 5.5.1; (b) where a request for information is made by an interested party established outside the Union, the Agency;
Risk	The frequency of occurrence of accidents and incidents resulting in harm (caused by a hazard) and the degree of severity of that harm. (Art.3.(1) of Regulation (EU) 402/2013 – CSM for risk assessment)
Reporter	A natural person who reports an occurrence or other safety-related information pursuant to future COR system
TDG Occurrence	An occurrence as defined in section 1.8.5 of the 'RID' annex of Directive (EU) 2008/68

Table 3 Table of Abbreviations

Abbreviation	*Meaning*
COR	Common Occurrence Reporting
CSM	Common safety method
ERAIL	European railway accident information links
IM	Infrastructure Manager
MS	Member state
NIB	National investigation body
NSA	National Safety Authority
NOR	National occurrence reporting
RSD	Railway Safety Directive
RU	Railway Undertaking
System proposal	System Proposal for COR Safety Management Data
SMD	Safety management data
TDG CAs	TDG Competent Authorities referred to in section 1.8.5.1 of 'RID' annex to Directive (EU) 2008/68 collecting information on TDG occurrences
TDG	Transport of Dangerous Goods
WP	Working party

3. Purpose of the document

This paper forms part of the Agency's Common Occurrence Reporting project and builds on previous consultation papers on Designing the common occurrences and taxonomy, Legislation, Phasing and Roles, use of data and governance. The purpose of this paper is to present a structure and content for System Proposal for COR Safety Management Data.

It is important to note that:

- The System Proposal proposed in this document is supported by the accompanied impact assessment, which consists of the necessary cost-benefit analysis of considered different options.
- **There will be further opportunities to refine System proposal, as it is foreseen in the COR project plan after discussions and consultations with stakeholders (particularly on legislation and taxonomy paper) in 2016, that the future COR system should be defined by the legislation i.e. CSM which would legally establish the COR system. Thus, when the decision will be taken by the Commission to issue a mandate for CSM which would legally establish theCOR system, considerable work will be needed, working with stakeholders, to develop, and agree as far as possible, a recommendation, according to the Agency normal working procedures. In this case, the system proposed in this document is to be considered as a starting point and will facilitate the discussion in the WP for CSM which would legally establish the COR system. Clearly the scope of CSM which would legally establish the COR system might have an influence on the structure of the system and the reporting scheme.**

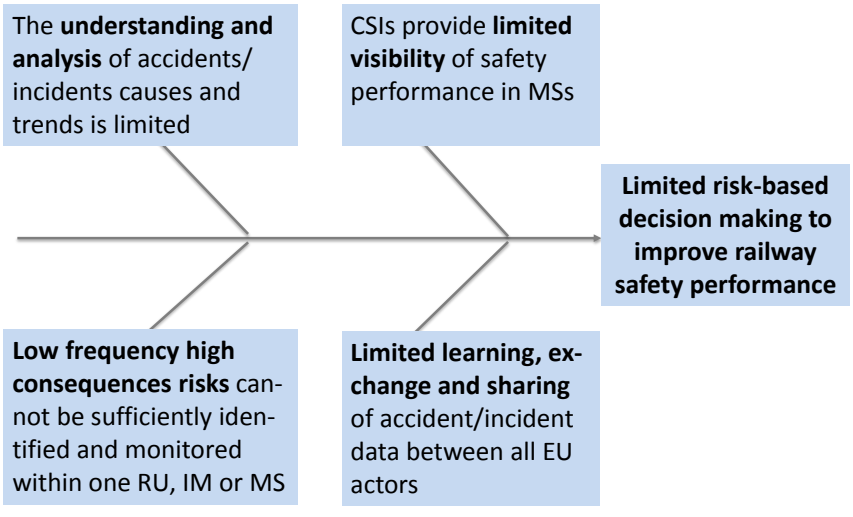
4. Background

The Agency started to work on the Common occurrence project in 2015. The first project plan was issued in 2016 and an updated version in 2017. So far, the following results were achieved regarding COR SMD:

- 5 papers on different future COR system topics
- 3 workshops with stakeholders
- 5 consultations with stakeholders

This work provided a solid basis for the impact assessment and for the system definition proposed in this document which is now published for consultation with the stakeholders. A dedicated workshop will be arranged to facilitate the discussion (see paragraphs 7 and **Error! Reference source not found.**).

4.1. Context and problem definition



For more details, please see Impact assessment section 1.

4.2. Objectives

General objective:

Contribute towards **better risk-based decision making to improve railway safety performance**

Specific objectives:

- **SO1** Improve **risk profiling and modelling techniques** regarding accidents and incidents
- **SO2** Ensure **broader visibility** of safety performance in Member States
- **SO3** Enable **identifying and monitoring** low frequency high consequence risks
- **SO4** Improve **learning, exchange and sharing** of accident / incident data between all EU actors

For more details, please see Impact assessment section 2.

4.3. Options which were considered in the Impact assessment

Options for data content

Building block	Baseline	Minimum (Option 1)	Medium (Option2)	Maximum (Option 3)
Reportable occurrences and taxonomy	Aggregated CSIs	CSIs +taxonomy	CSIs +additional incidents +taxonomy	CSIs +additional incidents +taxonomy
Reporting scheme	Mandatory	Mandatory	Reporting CSIs mandatory; Reporting additional incidents voluntary.	Mandatory
Scope	RUs/IMs operations			
Entry and quality of data on EU level	NSA	Ensured by the National Reporting Authority (NRA) e.g. NSA/NIB/TDG CA/Sector association, etc. appointed by the Member State.		

IT options

IT building block which varies with Min, Med, Max options

Reporting system	No IT system	EU IT system & national IT systems are not connected	EU IT system & national IT systems are connected
Functionality for data visualization and analytics	No	Optional	Yes

For more details, please see Impact assessment section 3. Impacts of the options are provided in section 4, comparison of options and preferred option which is the basis for System proposal in section 5. Impact assessment supported option 1 as the preferred option.

5. System proposal

5.1. Subject matter

This paper provides a system proposal for an EU Common Occurrence Reporting scheme, aiming at improvement of railway safety by ensuring that information on safety-related accidents and incidents is reported, collected, stored, protected, exchanged, disseminated and analysed. This information to be, in turn, used to support decision making by the different actors and their related roles, as defined in the Paper on roles, use of data and governance. In particular, this exchange of information will help to ensure:

- that different railway actors could fulfil their roles and responsibilities and improve their decision-making framework (more details are available in the impact assessment (objectives)) through the analysis of safety occurrences data;
- that, where appropriate, safety action is taken in a timely manner based on analysis of the information collected;
- that railway safety risks are considered and dealt with at both EU level and national level, through the sharing of return of experience at all levels.

In order to achieve these objectives, it is also necessary the system proposal for an EU COR scheme addresses that:

- the safety information is continuously available by introducing rules on confidentiality and on the appropriate use of information and through the harmonised and enhanced protection of reporters and persons mentioned in occurrence reports;
- the sole objective of occurrence reporting is the prevention of accidents and incidents and not to attribute blame or liability.

5.2. Scope

The future COR reportable occurrences have to be reported from RUs/IMs service operations (passenger, freight, transport of dangerous goods, etc.) in all EU Member States. Shunting operations are also in the scope. The COR regime and the use of the COR system will be open to the involvement, on a voluntary basis, of third countries willing to be part of the collection and sharing of information, provided that they will follow the common principles developed under a future EU legislation regulating the COR scheme. For this purpose, specific agreements with the concerned countries could be considered and would require to be further define. .

The establishment of a mandatory COR reporting scheme (including the necessary transition periods, if deemed necessary) and of the related tool and/or interface with national occurrence reporting systems will require the development of a new regulation, under the form of a CSM as provided by the Directive (EU) 2016/798. For the purpose of adopting a new mandate to develop this related CSM, the European Commission will have to propose the related mandate to the Member States. The development of this new CSM which would legally establish the COR system would be then carried out through an Agency working party. A particular attention will be paid while developing such new CSM in order to ensure consistency and avoid overlapping provisions with existing requirements, in particular related to the reporting and analysis processes of safety occurrences already implemented in RUs and IMs' SMS through the CSM on Monitoring.

It should be mentioned, that most of the stakeholders who provided comments during the previous consultations considered that including ECMs and occurrences detected during maintenance in the scope of COR would need further work, both in term of taxonomy and roles description. This is why, as a first step, the Agency proposes to focus firstly on reporting by RUs and IMs as they are the closest to operation and so most of the occurrences. This aims to facilitate the implementation of a COR regime at the level of the organisations primarily concerned with them. However, if in time the need to include ECMs in the scope of COR is confirmed, this possibility and the related needs will be further considered at a later stage. This could be achieved during future revisions of CSM which would legally establish the COR system.

Based on the Taxonomy paper and result of impact assessment, future suggested reportable occurrences are provided in **Annex I** and suggested accompanied taxonomy is provided in the **Annex II**. The occurrences to be reported are formed of the current CSIs, as provided in the Annex I, allowing an alignment with the current practices and legal requirements. Each of these events will be reported and collected individually, accompanied with the relevant details from the taxonomy, into the future EU COR IT tool, following the reporting scheme further described in the following chapters of this paper.

Nevertheless, future COR reportable occurrences and the taxonomy will be finalised by the WP of CSM which would legally establish the COR system, in collaboration with the JCGE[1] concerning TDG occurrences. Annex I and Annex II will be considered as a starting point for further discussion in the WP.

The analysis of the occurrences, performed by each entity in its own role as described in the paper on roles and use of data will form the main outputs of the COR system. For the purpose of these analysis, other data, such data related to the traffic might be necessary to be collected and considered. More detailed needs related to their collection through the future COR system will be considered in the WP on the CSM which would legally establish the COR system.

5.3. Definitions

Definitions of reportable occurrences and the taxonomy are provided in **Annex III**. However, it is important to note:

- occurrence definitions were taken from the Taxonomy paper, which was consulted with the stakeholders;
- thresholds are also defined by the definitions of serious and significant as defined by the CSIs; occurrences below these thresholds will not have to be reported to the COR system;
- the Agency recognises that clear and agreed definitions for reportable occurrences, causes and consequences are essential and can take considerable work to refine. **This work will be finalised when the Agency receives a mandate to develop CSM which would legally establish the COR system, a working group will be created to develop detailed definitions which would be directly**

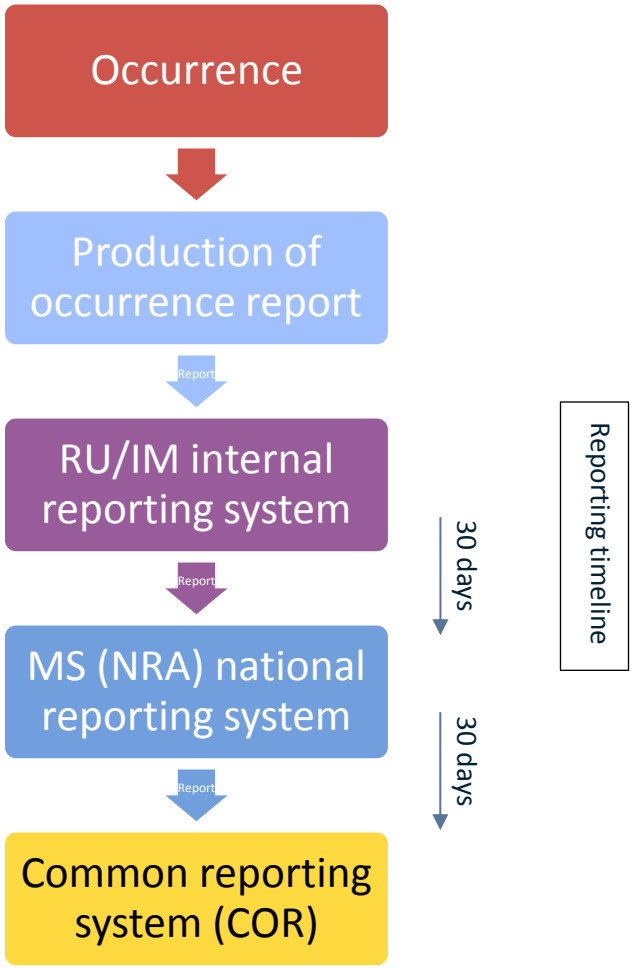
[1] JCGE: Joint Coordinating Group of Experts as defined in the conclusions of the RID/ATMF working group (TECH-16050).

applicable to all Member States. **Annex III will be considered as a starting point for the discussion in the WP;**

- there will be a user guide to help reporters as well. When the future EU COR IT tool will be developed, the Agency will also elaborate all necessary procedures and guidelines for the users.

COR system definitions relating to TDG services should be defined by TDG CAs who will report their definitions to the WP of CSM which would legally establish the COR system or TDG CAs experts could be invited to participate in the WP.

5.4. Reporting scheme and timing



Graph 1. Mandatory reporting scheme and timing

Based on the results of the impact assessment, the future COR reporting scheme should be mandatory and established through legislation (mandate for CSM which would legally establish the COR system). This also implies the following:

- Each RU/IM should establish, in their SMS and in line with the CSM on Monitoring, an internal mandatory reporting system to collect and share at least the occurrences referred to in Annex I with the supporting taxonomy referred to Annex II. The provisions on how information is reported into the internal company reporting system from employees/staff and contractors of RUs/IMs is let to the freedom of each RU and IM. The report of causes of occurrences in particular often requires an investigation in adequacy with the severity/frequency/complexity of each particular occurrence.

Therefore, the timing for reporting of the taxonomy information of each event into the future COR system has to take it into account.

- Each Member State should establish a mandatory reporting system[2] at national level, in order to facilitate the collection of details of occurrences collected by RUs/IMs. The scope of those national occurrence reporting systems is let to the freedom of the Member States as it is often today regulated through national legislation. However, Member States will have to ensure that the information collected at national level at least include the information necessary to be communicated then to the future COR system (Annex I and II). Therefore, the transmission of information between existing national reporting systems and the future COR system might take different forms (automatic regular transmission, live interface, manual entering of national occurrence into COR, etc.), that will have to be further investigated, depending on the existing systems established in the Member States, their complexity and completeness. Nevertheless, manual transmission of information from national occurrence reporting systems and the future COR should be avoided as it does not represent an efficient solution to deal with a large amount of data.
  This also means that national systems might need to be structured and changed to be in line with future CSM which would legally establish the COR system. Phasing aspects and different strategies could be further discussed in the future working party.
- The Agency should establish a mandatory common occurrence reporting system to facilitate the collection of details of occurrences collected by Member States, either through transmission of data from national occurrence reporting systems to the future COR, or through direct input into the COR system. This future COR system will be also made available to Member States for the implementation of national occurrence reporting scheme and to RUs/IMs for the implementation of their internal reporting scheme, in particular where such reporting system does exist yet at national and/or RUs/IMs level. Further details about this option are provided in the section 5.5.1 of this paper.

The following final reporting timeline is proposed:

1. The employees or contractors of the RUs/IMs should report occurrences internally as soon as possible and in any event within 24 hours of becoming aware of the occurrence, unless exceptional circumstances prevent this (therefore there should be a list of such circumstances or there should be a process by which employees could report later and justify why it was late).
2. When RU/IM completes the investigation, occurrence reports should be transmitted to the national reporting authority within 30 days. Quicker notifications and/or intermediate report to national reporting authority and/or national safety authority might be required following national rules, especially in the context of supervision role of the national safety authority.
3. Occurrence reports should be transmitted to the EU COR IT tool by the NRA no later than 30 days after having been entered in the national database. In case of investigation of causes (Annex II of this document) requiring more investigation time by the RU/IM due to the complexity of the event, an intermediate report could be sent, containing only contextual information about the occurrence (at least the following fields should be considered: the date, time and place of the occurrence, its type and its consequences as regards fatalities, injuries and material damage), and allowing then the NRA to provide the complete information later as the investigation allow to report the causes of the event. **Mandatory details of occurrences collected in accordance with Annex I and Annex II, which will have to be reported by the RU/IM within the report will be determined by the WP of CSM which would legally establish the COR system.** Other mandatory complimentary details of the occurrences would have to be submitted later on, when the investigation of the occurrences is completed. Occurrence reports should be also updated whenever necessary with additional information, including updating the occurrence type if necessary.

[2] DNV study showed that only 1 MS has not established mandatory national reporting system

As it is explained in paragraph 5.5, the intention of the Agency is to replace the ERAIL with the future EU COR IT tool. For this aim and in case of occurrences subject to the investigation of the NIB concerned, specific provisions might be required regarding the timeframe in order to allow the NIB's investigation to be completed. The EU COR IT tool will have to be designed taking into account this aspect.

There should be a distinction between immediate report of an occurrence to respective NSA/NIB and providing data of the occurrence to the EU COR system. Reporting reportable occurrences to the national database or EU COR IT tool does not take/lift off the responsibility of the MSs to ensure the obligation of RUs/IMs or, where appropriate NSAs/TDG CAs to notify the accidents and incidents to the NIB as determined by Article 22 of RSD. However, if the NIB is managing the national database or has full access to the national database and notification to national database is considered as a notification of the accident/incident to NIB in the national legislation, Article 22 of RSD could be considered as fulfilled (in order to avoid double reporting).However, the Agency's view is that other arrangements than an IT tool are likely to be more suitable and efficient (such as, for example, a phone call) to achieve the need of urgent notifications to NIBs by RU/IM (which would imply availability and resource constraints regarding the use of an IT tool). This view has been confirmed by most of the stakeholders consulted. Therefore, such an option to use the future EU COR IT tool for the purpose of urgent notifications to NIBs was not further explored.

Also, it should be noted that depending on the occurrence not all taxonomy information will be relevant and should be reported. For example, if there is a broken rail, no information regarding rolling stock will be submitted because it was not relevant to the occurrence. It was assumed that depending on the occurrence categorical differences and only the relevant taxonomy information on the occurrence should be submitted. So, in some cases, some parts of the taxonomy would be non-relevant and in some cases it could be not mandatory to fill them or if the information is not available for primary notification, it could be updated in the final notification. The Agency does not have any intention of creating an unnecessary burden on reporters, understanding that this would undermine the use of the system. The level of detail required should be proportionate to the occurrence to ensure the taxonomy is limited to essential and mandatory fields. This process has to be followed in the new system design and build and agreed within the WP of CSM which would legally establish the COR system.

Taking into account the revised RSD and current CSI approach and consultation of the stakeholders, within the chain of occurrences the Agency proposes that each occurrence shall be reported under the type of the primary occurrence, even if the consequences of the secondary occurrence are more severe (e.g. a derailment followed by a fire. Reportable occurrence in this case will be derailment).

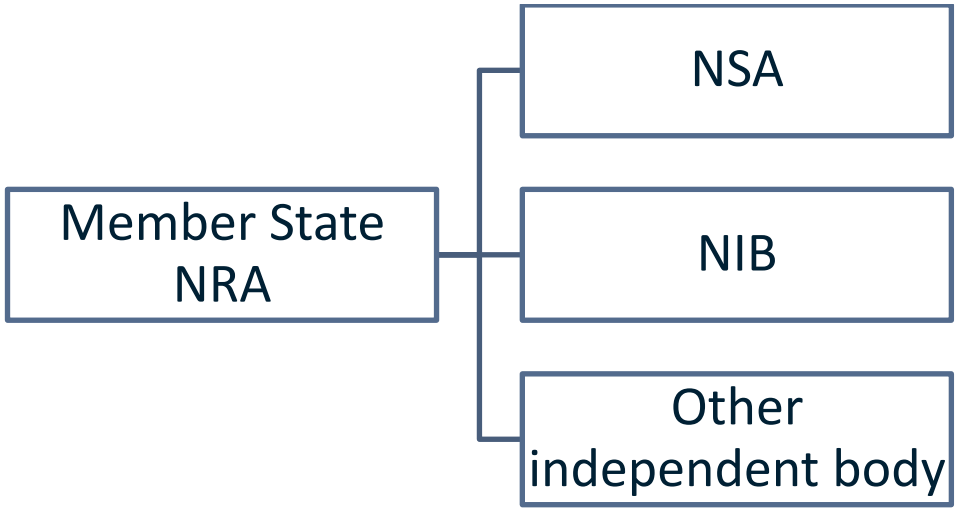
5.5. Data management

5.5.1. Data collection and storage

Graph 2. Promoting just culture within the occurrence reporting process by different actors

Through their SMS and in line with the CSM on Monitoring, each RU/IM should implement its own processes for the collection, evaluation, processing, analysis and storage of details of occurrences reported under Annex I and Annex II. The handling of the reports should prevent the use of information for purposes other than safety, and should appropriately safeguard the confidentiality of the identity of the reporter and any persons mentioned in occurrence reports. As a part of a just culture, the confidential reporting is creating trust in the systems for those who report. Any breach in this trust will possibly affect the willingness to report and undermine the benefit of occurrences reporting and analysis and will therefore potentially have a negative effect on the operational safety.

It is also important to consider that the determination of causes for all occurrences required to be reported in the COR tool requires often a deep and long investigation, that should proportionate with the severity/frequency/complexity of each particular occurrence. For this purpose, a risk classification supporting decision making about extent of investigation of different types of occurrences may be further developed later in the project, as further described in the section 5.8 of this paper.



Graph 3. Possible national reporting authorities designated by the Member State

Each Member State should designate one or more national reporting authorities to establish a mechanism to independently collect, evaluate, process, analyse and store details of occurrences reported under Annex I and Annex II. The handling of the reports should prevent the use of information for purposes other than safety, and should appropriately safeguard the confidentiality of the identity of the reporter and any persons mentioned in occurrence reports, with a view to promoting a 'just culture'. The national reporting authorities which should be designated by the Member State, either jointly or separately, are the following[3]:

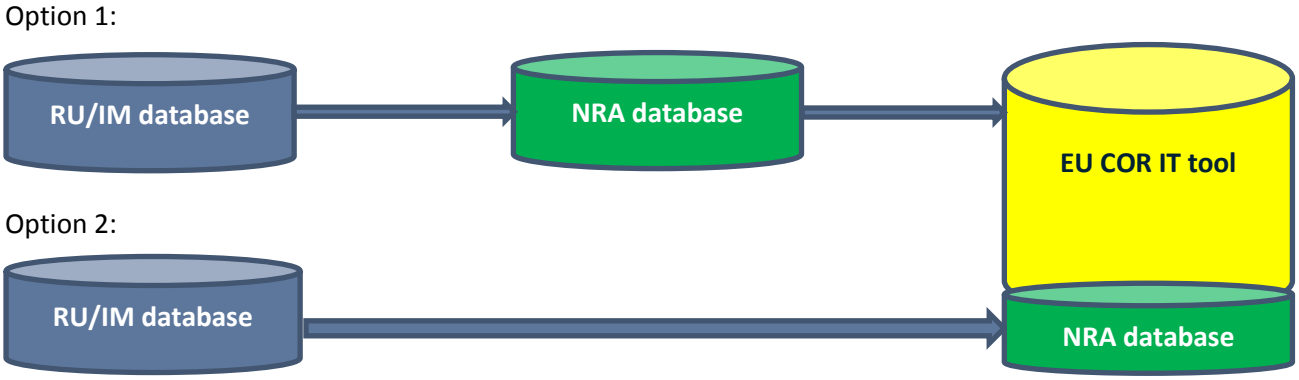
- the national safety authority; and/or
- the national investigation body; and/or
- any other already existing independent body or entity based in the EU that is entrusted with this function (e.g. TDG CA, sector association, etc.). However, for such cases, and in particular if a Member States would wish to delegate the role of NRA to a RU or an IM, clear rules and/or requirements regarding the role of the NRA in regards with its independency with other national RUs/IMs and the access of NSAs and NIBs to information collected by NRA will have to be further defined within the future working party in order to ensure feasibility and efficiency of the implementation.

A Member State can designate more than one body or entity when the management of the national occurrence reporting scheme is shared between more than one entity (e.g. the NIB and the NSA can jointly be responsible of the management of the national reporting scheme). In such case, the Member State should designate one of them as a point of contact for the transmission of information referred to in paragraph 5.64.

Establishment of the national reporting authority and related requirements should be introduced through a future CSM which would legally establish the COR system.

The Agency should designate one or more of its staff members to establish a mechanism to independently collect, evaluate, process, analyse and store details of occurrences reported in accordance with Annex I and Annex II. The handling of the reports should prevent the use of information for purposes other than safety, and should appropriately safeguard the confidentiality of the identity of the reporter and any persons mentioned in occurrence reports, with a view to promoting a 'just culture'.

[3] DNV study showed that usually NOR is managed by NIB or NSA or IM or sector association (e.g. RSSB)



Graph 4. Data collection and storage in the different actors' databases

RUs/IMs should store occurrence reports, drawn up on the basis of details of occurrences collected in accordance with Annex I and Annex II in one or more internal databases.

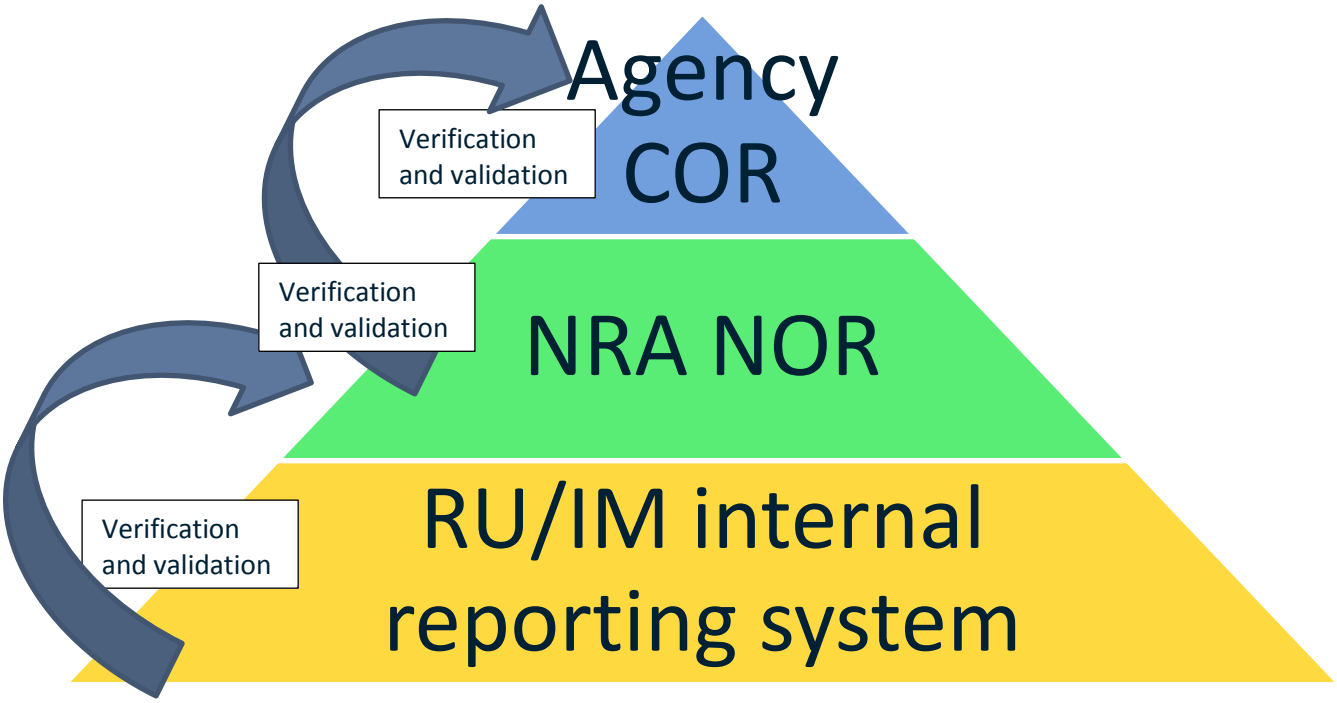
The national reporting authorities should store occurrence reports, drawn up on the basis of details of occurrences collected in accordance with Annex I and Annex II in a national database (option 1 illustrated in the graph 4). If the national reporting authority doesn't have a national database, it could use the EU COR IT tool to establish one (option 2 illustrated in the graph 4). Using the future COR system as national system or to support company internal reporting will have to be clearly separate from the use of COR as European occurrence collection system in order to allow Member States or RUs/IMs to adapt the taxonomy to their own needs (through more events to be collected or extended taxonomy) while facilitating the transmission of information to the COR at European level.

Relevant information on accidents and incidents collected and/or reported by national investigation bodies could also be stored in the national database.

The Agency should store occurrence reports, drawn up on the basis of details of occurrences collected in accordance with Annex I and Annex II in an EU database – EU COR IT tool, more details are provided in paragraph 5.6. The information from the NRA database (within or outside EU COR IT tool) would be forwarded/transmitted to the centralised EU COR IT tool.

If the NIB decides to investigate a particular accident or incident, after the investigation is completed, the NIB should store at the EU COR IT tool the final investigation report, and when available, a summary in English of the final investigation report and addressed safety recommendations i.e. the same what is done in ERAIL at the moment (see section 5.6.1 for more details).

5.5.2. Data quality assurance



Graph 5. Data quality checking processes by different reporting actors

It is proposed that the final occurrence reports referred to in Annex I should contain at least the information listed in Annex II (taxonomy). However, as it was mentioned before, this a proposal that should serve as a basis for further tuning and **the final list of reportable occurrences and taxonomy and mandatory fields for initial and final notification of the occurrence will be determined by the WP of CSM which would legally establish the COR system.**

RUs/IMs, Member States and the Agency should establish data quality checking processes to improve data consistency, notably between the information collected initially and the final report stored in the database.

The databases referred to in paragraph 5.5.1 should use formats which are standardised to facilitate information exchange with the EU COR IT Tool and be compatible with the Annex I and Annex II. This has still to be explored further in the later stages of the COR project.

Each national reporting authority is responsible for the data quality assurance of their respective MS occurrence reports.

The Agency should support the national reporting authorities of the Member States in their task of data integration, including for example in:

- the integration of the information referred to in Annex I and Annex II; and
- the establishment of data quality checking processes referred to this paragraph.

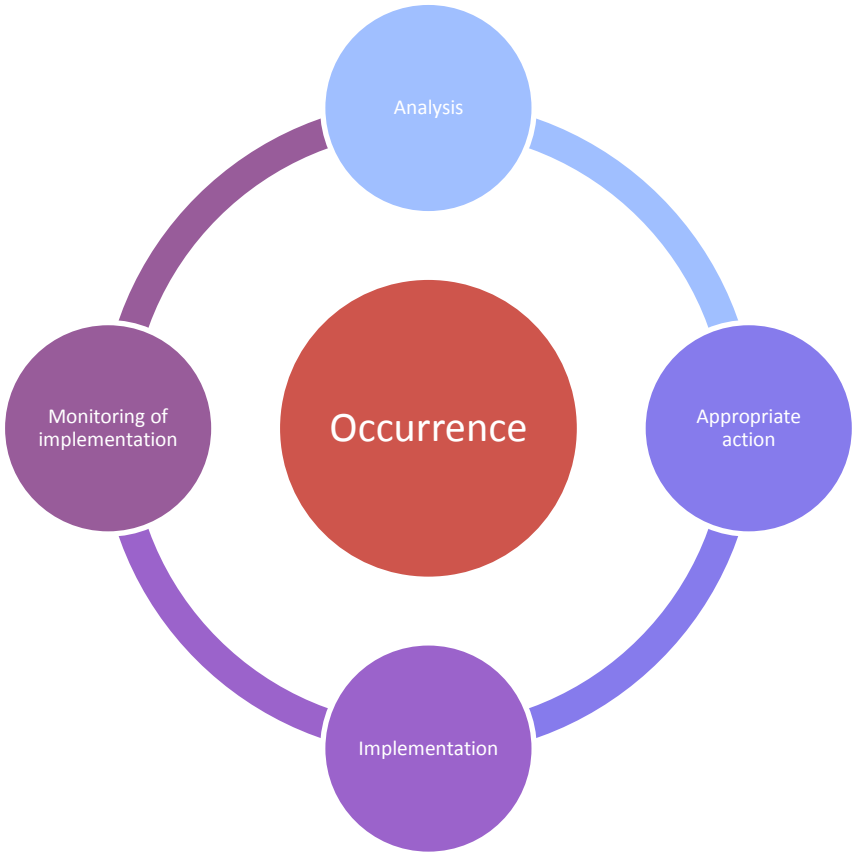
The Agency should provide that support in such a way as to contribute to the harmonisation of the data entry process across Member States, in particular by providing to staff working in the RUs/IMs, national reporting authorities and the Agency:

- guidance material;
- workshops; and
- appropriate training.

Another approach could be to define common mandatory quality process for all actors. This could be done by CSM which would legally establish the COR system.

Furthermore, future EU COR IT tool should also contain automatic data quality control check in order to ensure quality and consistency of the occurrence reports. More details are provided in paragraph 5.6.

5.5.3. Data analysis



Graph 6. General process of data analysis by different actors

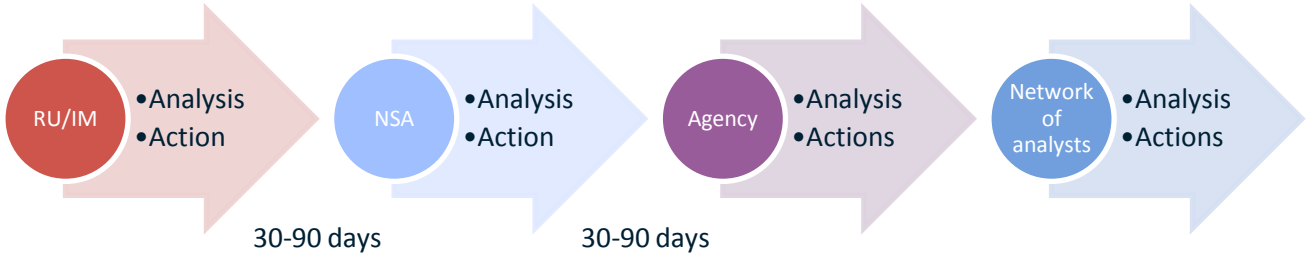
Each RU/IM shall develop a process to analyse occurrences collected in accordance with paragraph 5.4 in order to identify the safety hazards associated with identified occurrences or groups of occurrences. Based on that analysis, each RU/IM shall determine any appropriate corrective or preventive action, required to improve railway safety.

When, following the above mentioned analysis, the RU/IM identifies any appropriate corrective or preventive action required to address actual or potential railway safety deficiencies, it shall:

- implement that action in a timely manner; and
- establish a process to monitor the implementation and effectiveness of the action.

Each RU/IM shall regularly provide its employees and contractors with information concerning the analysis of, and follow-up on, occurrences for which preventive or corrective action is taken.

This process is already implemented in RU/IM's SMS through the application of the CSM on Monitoring, which implies that each RU/IM shall implement an internal reporting and monitoring scheme. A particular attention on this will be paid in the drafting of future new CSM which would legally implement the COR system in order to avoid unnecessary overlap with existing provisions.



Graph 7. Workflow of data analysis results by different actors

Where RU/IM identifies an actual or potential railway safety risk as a result of its analysis of occurrences or group of occurrences reported pursuant to paragraph 5.4, it should transmit to the national reporting authority and/or the national safety authority of that Member State, within 30 days from the date of notification of the occurrence by the reporter:

- the preliminary results of the analysis performed, if any; and
- any action to be taken.

RU/IM should report the final results of the analysis, where required, as soon as they are available and, in principle, no later than three months from the date of notification of the occurrence (except for occurrences which are being investigated by the NIB).

A national safety authority of a Member State may request RU/IM to transmit to it the preliminary or final results of the analysis of any occurrence of which it has been notified, but in relation to which it has received no follow-up or only the preliminary results.Where a national safety authority established in a Member State identifies an actual or potential railway safety risk as a result of its analysis of occurrences or group of occurrences reported pursuant to paragraph 5.4, it should transmit to the Agency, within 30 days from the date of notification of the occurrence by the reporter:

- the preliminary results of the analysis performed, if any; and
- any action to be taken.

The national safety authority should transmit to the Agency the final results of the analysis, where required, as soon as they are available and, in principle, no later than three months from the date of notification of the occurrence.

The tools/platforms/supports to be used for the exchange of information between national reporting authority/national safety authority will have to be defined by the future working party.

The Agency may request national safety authorities to transmit to it the preliminary or final results of the analysis of any occurrence of which it has been notified, but in relation to which it has received no follow-up or only the preliminary results.

Each national safety authority and the Agency should develop a process to analyse the information relating to occurrences which are directly reported to them in accordance with paragraph 5.4 in order to identify the safety hazards associated with those occurrences. Based on that analysis, they should determine any appropriate corrective or preventive action each at their level required to improve railway safety.

When, following the analysis referred to this paragraph, a national safety authority or the Agency identifies any appropriate corrective or preventive action required to address actual or potential railway safety deficiencies, it should:

- implement that action in a timely manner; and
- establish a process to monitor the implementation and effectiveness of the action.

For each occurrence or group of occurrences monitored in accordance with paragraph 5.4, each national safety authority should have access to the analysis made and should appropriately monitor action taken by the RUs/IMs for which it is respectively responsible.

If a national safety authority concludes that the implementation and the effectiveness of the reported action is inappropriate to address actual or potential safety deficiencies, it should ensure that additional appropriate action is taken and implemented by the RU/IM.

Where available, information relating to the analysis and the follow-up of individual occurrences or groups of occurrences obtained pursuant to this paragraph should be stored in the EU COR IT tool, in a timely manner and no later than two months after their storage in the national database.

National safety authority and Member States should use information obtained from the analysis of occurrence reports to identify remedial action to be taken, if any, within the annual safety plans accordingly with Article 4(g) of RSD.

In order to inform the public about of the level of safety in railways, each national safety authority should publish a safety review at least once a year. The safety review should:

- contain aggregated and anonymised information on the type of occurrences and safety-related information reported through its national mandatory and voluntary reporting systems if any;
- identify trends;
- identify the action it has taken.

National safety authorities may also publish anonymised occurrence reports and risk analysis outcomes.

Safety review could be provided in the NSA's annual report.

Guidelines and/or templates to support this safety review will be developed in collaboration with the national safety authorities.

The Agency and the national safety authorities of the Member States should, in collaboration, participate regularly in the exchange and analysis of information contained in the EU COR IT tool. Without prejudice to the confidentiality requirements laid down in the future COR system, observers (RU/IM, manufacturers, etc.) may be invited on a case-by-case basis, where appropriate or as a permanent members.

The Agency and the national safety authorities of the Member States should collaborate through a network of railway safety analysts. The setting up of such a collaborative group at EU level was broadly supported by the stakeholders during previous consultations. The network of railway safety analysts should contribute to the improvement of railway safety in the EU, in particular by performing safety risk analysis. In addition, the Agency and the network of analysts should provide any advice for future changes to EU COR IT tool technical specification and revisions of CSM which would legally establish the COR system to the Commission.

The Agency should support the activities of the network of railway safety analysts by, for example, providing assistance for the preparation and organisation of the meetings of the network.

The Agency should include information about the result of information analysis in the safety report referred to Article 35 of Agency regulation.

Similar platforms of exchange could also be envisaged at a national level in order to define and agree on priorities relevant at national level. This supports also better sharing of experience and knowledge at a local level that cannot reasonably reach through European group. Some Member States have already set such cooperation/coordination groups in order to identify areas of improvement on safety issues, facilitating cooperation on safety matters across the industry and sharing of good practices, with positive results (e.g. System Safety Risk Group managed by RSSB in UK, feedback meetings in France managed by EPSF).

5.6. System governance

5.6.1. IT System definition and interfaces

The Agency should manage an EU COR IT tool (a European Centralised Data Repository) to store all occurrence reports collected in the EU. The Agency should also adopt the arrangements and procedures for the management of the EU COR IT tool.

Each Member State should, in agreement with the Agency, update the EU COR IT tool by transmitting to it all information relating to safety occurrences, as provided in the Annex I and II, stored in the national databases referred to in paragraph 5.4. The Agency should agree with the Member States the technical protocols for transmitting to the EU COR IT tool all occurrence reports collected by the national reporting authorities, particularly for occurrences stored in the national occurrence databases.

Taking into account results of the impact assessment, EU COR IT tool should be connected with the national reporting IT tools or systems. Data exchange between national IT system and the EU IT tool could be based on manual integration (with some IT support) or on a fully developed IT interconnection. The individual national occurrence reporting systems should each provide their reports to the Agency in an automatised manner with limited human interaction needed if possible.

However, it is worth noting that the previous experience of the Agency in creating a link or an interface between national databases and European systems has shown that many technical and organisational issues can arise and lead to very time consuming and costly solutions (e.g. vehicle registers). The main issue is the different architectures of the national systems which makes the connection of all the Member States extremely complicated and unreliable.

Thus, if there would be no technical possibility to connect the EU COR IT tool with the national IT tool, manual entry or an import tool for a structured preformatted file loaded with national reporting information could be considered as an option. In case where a MS does not have a specific IT tool and database to manage national occurrence reporting system, the Agency should provide an additional functionality within the EU COR IT tool to include a national occurrence reporting IT tool and database within the EU IT tool, as it is also explained in the section 5.4 of this paper . In this particular case the national reporting authority would be still responsible for a data quality check. In addition, the data after the quality check will be consistent and easily transferable to the EU COR database. Functionality for data visualisation and analytics should be also considered in the EU COR IT tool.

National databases might need to be modified if necessary to support collecting reportable occurrences and the proposed taxonomy (in order to be in line with Annex I and Annex II and definitions). When EU COR IT tool is established, the ERAIL system could be discontinued if it provides all the same functionalities and collects the same necessary data (in particular NIB reports and CISs). In this case, no double reporting from NSAs would be required, it will be possible to extract CSI data from the EU COR IT tool. Furthermore, possible migration of the NIB ERAIL system to COR system to support NIB reporting to the Agency and provide the link to a NIB report of investigated occurrences could be implemented.

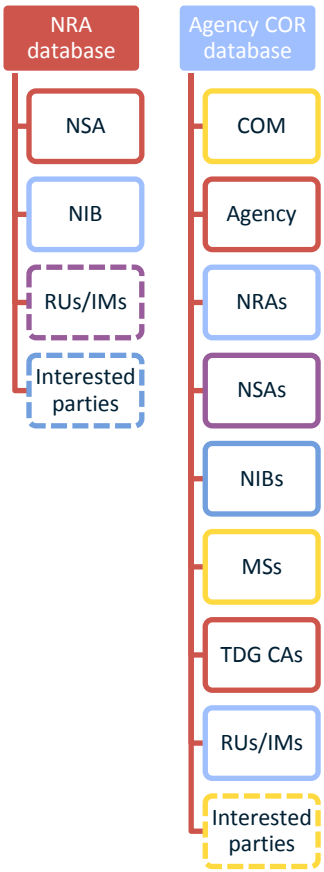
In the long term strategy the EU COR IT tool could be considered as one reporting tool for reporting occurrences within the EU (a unique centralised data repository, where the national databases will be closed and all the occurrence reporting will be done at EU level with a centralised system). Then MSs do not have to spend resources on their own IT tools development. Also, the double reporting will be removed (from the national database to EU IT tool). However, this is not proposed from the beginning of the future COR system as it was not supported by the stakeholders. From the generic comments received by the stakeholders, the solution of a unique and centralised database was not supported, in particular considering the importance of the national systems. Nonetheless, this option could be considered in the future revisions of CSM which would legally establish the COR system.

During the development of EU COR IT tool technical specification, the Agency should consider:

- A multilingual reporting functionality (reporting fields). Free text could be reported into COR in English in order for everybody to understand the details of the occurrences. For this purpose and in order to avoid additional work from the NRAs, automatic translation tools will be evaluated and could be implemented if available and suitable for the purpose;
- the possibility of marking the occurrence on the map to help the reporter and to ensure the quality of the reporting location;
- the possible interaction of the EU COR IT tool with the register of infrastructure (RINF) and European Vehicle Register;
- the possibility of automatically identifying the accident type (serious, significant) when the consequences of the accident are known and reported;
- the possibility to report a chain of events;
- the extraction of CSIs data;
- the reporting of NIB investigation reports and related safety recommendations;
- the possibility of reporting both the reported causes identified through the investigation conducted internally by the RU/IM and the causes finally identified by the NIB through its investigation, which would be determined by a set of rules (e.g. If COR system will be replacing ERAIL, then when the NIB decide to investigate the occurrence the RU should not be obliged to report causes).
- the risks related to security issues (cybersecurity/hacking);
- the implementation of agreed confidentiality and reporting rules;
- to gain user support – those who will input data or receive reports from the occurrence reporting system should have a means of providing input to the future design and operation of the system so that they understand and support the use of the reporting system;
- to ensure ease of use – The easier the reporting system is to use the greater will be the use of the system. Standard forms and templates based on a limited set of simple criteria encourage reporting. It is clear, that when reporting in future COR IT tool the reporting rules could suggest a primary component (occurrence) and then any relevant objects (person, train, track, etc.) for that occurrence appear in the data flow to add to the event depending on the occurrence.
- an automatic data quality control check in order to ensure quality and consistency of the occurrence reports;
- a functionality for data visualisation and analytics;
- the COR IT solution providers should supply the technical infrastructure of the system and ensure data protection, data integrity and the overall system security;
- to provide the functionality of the national occurrence database within the EU COR IT tool for Member States, which does not have IT tools or databases
- to envisage a link to company code reference file within the Agency reference data set;
- the number of occurrences/information to be reported in the EU COR IT tool which influences the capacity and processing power in particular and therefore the architecture choice.
- Etc.

The final technical specification of the future EU COR IT tool should be also discussed with the stakeholders and this is planned already in the COR project. Consultation and input should also be considered within the WP of a CSM which would legally establish the COR system.

5.6.2. Dissemination of information stored in the EU COR IT tool and national databases



Graph 8. Access of different actors to different databases

Member States and the Agency should participate in an exchange of information by making all information relating to safety stored in their respective reporting databases available to the national reporting authorities of the other Member States, the Agency and the Commission, through the EU COR IT tool.

A Member State or the Agency should forward all pertinent safety-related information to the relevant authority of the Member State or the Agency as soon as possible if, while collecting details of occurrences or when storing occurrence reports or carrying out an analysis in accordance with paragraph 5.5.3, it identifies safety matters which it considers either:

- to be of interest to other Member States or the Agency; or
- to possibly require safety action to be taken by other Member States or the Agency.

This could be also done through the network of analysts.

National investigation bodies should have full access to their respective national database for the purpose of discharging their responsibilities pursuant to Articles 20-26 of RSD.

National safety authorities of Member States should have full access to their respective national database for the purposes of their safety-related responsibilities pursuant to Article 16-19 of RSD.

In addition, any entity entrusted with regulating railway safety (i.e. the European Commission, Agency, NSAs, NIBs, TDG competent authorities, Member states), within the EU should have secure full online access to information on occurrences contained in EU COR IT tool. The information should be used in accordance with paragraph 5.7.

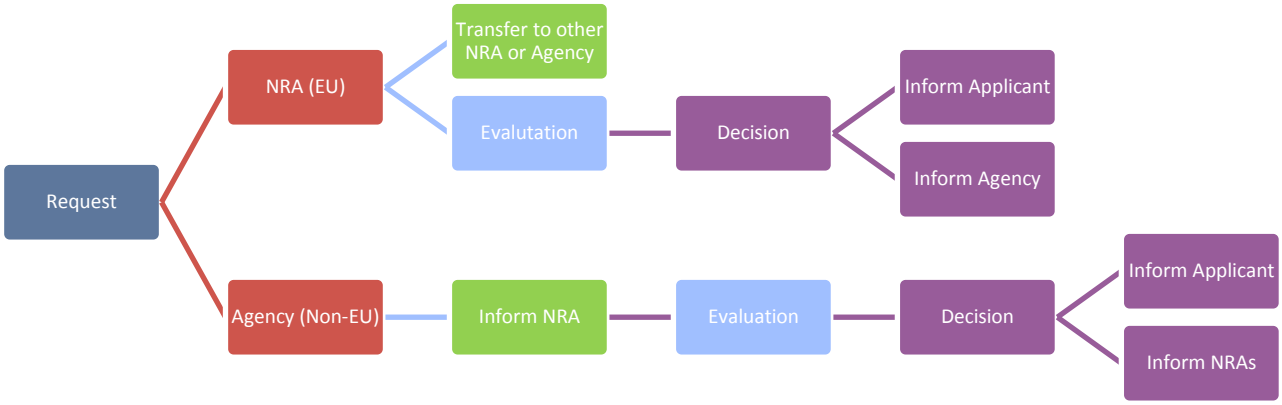
Last, but not least, RUs/IMs should have access to the EU COR IT database to fulfil the roles and responsibilities defined by the legislation as well.

Interested parties listed in Annex IV may request access to certain information contained in the EU COR IT tool. Interested parties established within the EU should address requests for information to the point of contact of national reporting authority of the Member State in which they are established. Interested parties established outside the EU should address their request to the Agency. The Agency and the national reporting authorities of the Member State should share the requests made. Information contained in the EU COR IT tool relating to ongoing safety investigations conducted in accordance with Articles 20-26 of RSD (NIB investigations) should not be disclosed to interested parties.

For each category of above mentioned different actors, user access policies should be developed and agreed with the concerned stakeholders.

For security reasons, interested parties should not be granted direct access to the EU COR IT tool.

5.6.3. Processing of requests and decisions



Graph 9. General process flow of processing of requests by the EU and Non-EU interested parties

Requests for information contained in the EU COR IT tool should be submitted using a form that will be provided by the future user interface. The information the form should contain is set out in Annex V.

A point of contact which receives a request should verify that:

- the request is made by an interested party;
- it is competent to deal with that request.

Where the point of contact of national reporting authority of a Member State determines that another Member State or the Agency is competent to deal with the request, it should transfer it to the national reporting authority of that Member State or to the Agency, as appropriate.

A point of contact or the Agency which receives a request should evaluate on a case-by-case basis whether the request is justified and practicable. A point of contact may supply information to interested parties on paper or by using a secure electronic means of communication.

Where the request is accepted, the point of contact should determine the amount and the level of information to be supplied. Without prejudice to paragraph 5.7., the information should be limited to what is strictly required for the purpose of the request.

Information unrelated to the interested party's operations or field of activity should be supplied only in aggregated or anonymised form. Information in a non-aggregated form may be provided to the interested party if it provides a detailed written justification. That information should be used in accordance with paragraph 5.7.

A point of contact or the Agency receiving a request from an interested party listed in Annex IV may take a general decision to supply information on a regular basis to that interested party, provided that:

- the information requested is related to the interested party's own equipment, operations or field of activity;
- the general decision does not grant access to the entire content of the database;
- the general decision relates to only anonymised information.

The interested party should use the information received pursuant to this paragraph, subject to the following conditions:

- the interested party should use the information only for the purpose specified in the request form, which should be compatible with the objectives of paragraph 5.1; and
- the interested party should not disclose the information received without the written consent of the information provider and should take the necessary measures to ensure appropriate confidentiality of the information received.

The decision to disseminate information should be limited to what is strictly required for the purpose of its user.

5.6.4. Record of requests and exchange of information

The point of contact should record each request received and the action taken pursuant to that request. That information should be transmitted in a timely manner to the Agency whenever a request is received and/or action is taken.

The Agency should make available the updated list of requests received and action taken by the various points of contact and by the Agency itself to all points of contact.

5.7. Data protection and confidentiality

5.7.1. Confidentiality and appropriate use of information

Member States and organisations, in accordance with their national law, and the Agency should take the necessary measures to ensure the appropriate confidentiality of the details of occurrences received by them. Each Member State, each organisation established in a Member State, or the Agency should process personal data only to the extent necessary for the purposes of the COR system (e.g. user registration in the IT tool) and without prejudice to the Commission Regulation (EU) 2016/679 (General Data Protection Regulation).

Information derived from occurrence reports should be used only for the purpose for which it has been collected. Member States, the Agency and organisations should not make available or use the information on occurrences:

- in order to attribute blame or liability; or
- for any purpose other than the maintenance or improvement of railway safety.

The Agency and the national reporting authorities of the Member States, when discharging their obligations under paragraph 5.5.3 in relation to the information contained in the EU COR IT tool, should:

- ensure the confidentiality of the information; and
- limit the use of the information to what is strictly necessary in order to discharge their safety-related obligations without attributing blame or liability; in this respect, the information should be used in particular for risk management and for analysis of safety trends which may lead to safety recommendations or actions, addressing actual or potential safety deficiencies.

Member States should ensure that their national reporting authorities and their competent authorities for the administration of justice cooperate with each other through advance administrative arrangements or national laws. These advance administrative arrangements or national laws should seek to ensure the correct balance between the need for proper administration of justice, on the one hand, and the necessary continued availability of safety information, on the other.

5.7.2. Protection of the information source

For the purposes of this paragraph, 'personal details' includes in particular names or addresses of natural persons.

Each organisation established in a Member State should ensure that all personal details are confidential to the staff of that organisation except persons designated in accordance with paragraph 5.5.1 in order to investigate occurrences with a view to enhancing railway safety. Anonymous information should be disseminated within the organisation as appropriate.

Each Member State should ensure that no personal details related to occurrences are ever recorded in the national database. Such anonymous information should be made available to all relevant parties, for example to allow them to discharge their obligations in relation to railway safety improvement.

The Agency should ensure that no personal details related to occurrences are ever recorded in the Agency database (EU COR IT tool). Such anonymous information should be made available to all relevant parties, for example to allow them to discharge their obligations in relation to railway safety improvement.

Member States and the Agency should not be prevented from taking any action necessary for maintaining or improving railway safety.

Without prejudice to the applicable national criminal law, Member States should refrain from instituting proceedings in respect of unpremeditated or inadvertent infringements of the law which come to their attention only because they have been reported. This should not apply in the following situations cases:

- in cases of wilful misconduct, gross negligence or destructive acts;
- where there has been a manifest, severe and serious disregard of an serious risk and profound failure of professional responsibility to take such care as is evidently required in the circumstances, causing foreseeable damage to a person or property, or which seriously compromises the level of railway safety.

Member States may retain or adopt measures to strengthen the protection of reporters or persons mentioned in occurrence reports. Member States may in particular apply this rule without the exceptions referred before (i.e. wilful misconduct, etc.).

If disciplinary or administrative proceedings are instituted under national law, information contained in occurrence reports should not be used against:

- the reporters; or
- the persons mentioned in occurrence reports.

This should not apply in the cases referred before (i.e. wilful misconduct, etc.).

Member States may retain or adopt measures to strengthen the protection of reporters or persons mentioned in occurrence reports. Member States may in particular extend that protection to civil or criminal proceedings.

Member States may adopt or maintain in force legislative provisions ensuring a higher level of protection for reporters or for persons mentioned in occurrence reports.

Except where specific cases (i.e. wilful misconduct, etc.) apply, employees and contractors who report or are mentioned in occurrence reports collected should not be subject to any prejudice by their employer or by the organisation for which the services are provided on the basis of the information supplied by the reporter.

Each organisation established in a Member State should, after consulting its staff representatives, adopt internal documentation describing how 'just culture' principles are guaranteed and implemented within that organisation.

5.7.3. Access to documents and protection of personal data

With the exception of paragraphs 5.7.1 and 5.7.2, which establish stricter rules on access to the data and information contained in the EU COR IT tool, Regulation (EC) No 1049/2001 should apply. In addition, the Commission Regulation (EU) 2016/679 (General Data Protection Regulation)should be respected as well .

5.8. Risk classification scheme

It is not proposed from the beginning, that a risk classification scheme should be implemented in the future COR system, i.e. in the initial scope of CSM which would legally establish the COR system. However, in the COR project a separate paper on the long term evolution of risk modelling and safety management data is expected to be delivered in 2018. This paper should bring together the results of the TDG roadmap (Risk estimation and decision-making guides for TDG), the study into Big Data and the potential to combine the benefits with the Safety Management Data work. Also, a separate study[4] by DNV has been conducted already and could be taken into account. It could be possible that at the time the paper is delivered and consulted on with the stakeholders (several stakeholders have already mentioned the need to define a risk classification scheme in order to classify each occurrence according to their related risks, allowing a proper risk-based approach and in order to proportionate investigations of occurrences to those that are really relevant), the mandate for CSM which would legally establish the COR system could be amended to introduce risk classification scheme or introducing this scheme could be postponed for future revisions on CSM which would legally establish the COR system. However, some NORs already having developed a different methodology for such risk classification, there will be a need to further consider and discuss the need or not for an harmonised approach within a future working party at a later stage of the project.

The idea behind is that the occurrence reports referred to in Annex I could include a safety risk classification for the occurrence concerned. That classification could be reviewed and if necessary amended, and could be endorsed by the national reporting authority of the Member State or the Agency, in accordance with the common European risk classification scheme which could be developed. The common European risk classification scheme could be introduced via a CSM which would legally establish the COR system.

The Agency in close cooperation with the Member States and through the network of railway safety analysts with the cooperation of sector organisations, could develop a common European risk classification scheme to enable the RUs/IMs, Member States and the Agency classify occurrences in terms of safety risk. In so doing, the Agency could take into account the need for compatibility with existing risk classification schemes.

The Agency might also consider supporting authorities and stakeholders in decision-making and prioritisation by developing (IT) tools for analytic hierarchy processes (e.g. visual risk modelling techniques – as an example) and risk classification methods. However, it is important to recognise that developing a data set, analysis and models can only support railway actors making their own assessments of their own risks, and should not become a risk model that would assume or replace the responsibility of railway operators to perform their risk assessment of their own risks.

[4] http://www.era.europa.eu/Document-Register/Pages/Research-on-risk-models-at-European--level.aspx

Nonetheless, the risk classification scheme is not in the initial System proposal for the future COR system.

5.9. Entry into force and application

As mentioned above, the future COR system should be finalised by the CSM which would legally establish the COR system. The WP for the CSM which would legally establish the COR system will draft the CSM requirements and also propose the entry into force and application dates for future COR system. The phasing of the implementation of the COR scheme will have to be taken into account in the WP in regard with existing systems already implemented.

5.10. Historical data

Data from existing Member State national occurrence reporting regimes could be imported into the EU COR IT tool to establish a searchable historical record. However, because of different scopes and system taxonomy proposals and NOR, it would be likely to be incomplete in some aspects. Nevertheless, this aspect could be discussed in the WP of CSM which would legally establish the COR system in order to take any further decisions.

5.11. Audits of CSM on COR implementation

The Agency should have the right in the future to audit implementation CSM which would legally establish the COR system in order to check how it is implemented within the Member States. This could be considered under already developed auditing programmes within the Agency (e.g., NSA monitoring, cross-audit, matrix, etc.) or creating separate one.

5.12. Limitations of the proposal

This proposal is a result of internal Agency work carried out according to the COR project plan with the contributions of different stakeholders during various previous consultations on different COR papers and topics. It should be noted that the Agency does not have direct access to all MSs NOR systems. Thus, it was not possible to include these other systems as part of the in-depth analysis carried out. The Agency did not investigate how historical data can be catered for in a future COR system, but this could be done when designing a final EU COR IT tool. **As it was stated before several times, this proposal should be considered as a starting point for the discussions in the WP of CSM which would legally establish the COR system when the Agency will receive the mandate from the Commission.**

5.13. Future possible changes for the COR scope

Clearly, during implementation of the future COR system, reportable occurrences and taxonomy could be changed from lessons learned and from the experience of the users and the Agency. Thus, there should be established clear change control procedure in the future CSM which would legally establish the COR system or the Agency procedures (e.g. Change Control Management procedure) taking into account a cost-benefit analysis of proposed changes.

5.14. Link with the Safety culture project

The implementation of a COR system is intended to support improvement of the reporting culture within the EU rail system, and therefore the safety culture within RUs/IMs and authorities (please refer to safety culture project for further details).

5.15. Link with the TDG Roadmap

The implementation of a COR system is intended to support the reporting of TDG occurrences which will also have to collect relevant information for supporting the implementation of the 'Guide on Inland TDG risk estimations' to be published in 2018. As foreseen from the beginning of the COR project the needs of the future TDG Roadmap developments will be considered for the future developments of the COR system.

6. Outcomes from the consultation

The first version of the paper on system proposal was elaborated by the Agency and provided for comments to railway stakeholders (including railway operational actors and authorities) from 24/11/2017 to 23/02/2018. A dedicated workshop was organized by the Agency on 10th and 11th January 2018 to support the consultation.

This second version includes the comments received as a result of the consultation, and also those provided during the above mentioned workshop.

The Agency appreciates all received comments and proposal from the various railway organisations and authorities. This consultation provided a general view to the Agency of stakeholders expectations and raised questions and issues which should be tackled for the future development and implementation of the COR project. These questions, comments and proposal have been taken into in this revised version of the paper to the extent possible, or will be considered for the next step of the project, in particular for the work of the working party will be established, when a mandate will be adopted.

7. Proposed next steps

This is the first comprehensive proposal aiming to achieve a common understanding of the different aspects related to the establishment of a COR system. The final aim of this paper is to serve as a basis for further work of a future working party.

It should be noted that the interpretation given in this proposal that has been developed by the COR project team, to start the discussion with a wide range of stakeholders and experts in order to find common ground between all parties.

In time, if a decision is taken by the Commission to issue a mandate for legislation covering a common occurrence reporting system, considerable work will be needed, working with stakeholders, to develop, and agree as far as possible, a recommendation, according to the Agency's normal working procedures.

Annex I – Reportable occurrences

A	**Accidents**
A1	**Collision**
A1.1	**Collision of train with rail vehicle**
A1.1.1	• *Front to Front*
A1.1.2	• *Front to End*
A1.1.3	• *Side (including front to side or side to side)*
A1.2	**Collision of train with obstacle within the clearance gauge**
A1.2.1	• *with objects fixed on or near the track*
A1.2.1.1	○ *with buffer stops*
A1.2.1.2	○ *with (part of) infrastructure (equipment) within clearance gauge*
A1.2.1.3	○ *with other fixed objects*
A1.2.2	• *with objects temporarily present on or near the track*
A1.2.2.1	○ *with animals (excluding birds)*
A1.2.2.2	○ *with rocks*
A1.2.2.3	○ *with landslides*
A1.2.2.4	○ *with trees*
A1.2.2.5	○ *with lost parts of railway vehicles*
A1.2.2.6	○ *with lost or displaced loads*
A1.2.2.7	○ *with vehicles and machines or equipment for track maintenance*
A1.2.2.8	○ *with road vehicles*
A1.2.2.9	○ *with other temporary objects*
A1.2.3	• *with overhead contact lines*
A2	**Derailment of train**
A3	**Level Crossing Accident**
A3.1	• *with one or more crossing vehicles*
A3.2	• *with crossing users (e.g. pedestrians)*
A3.3	• *with other objects temporarily present on or near track if lost by a crossing vehicle or user*
A4	**Accidents to persons involving rolling stock in motion**

A4.1	• *person hit by a railway vehicle (or by an object attached to, or that has become detached from, the vehicle)*
A4.2	• *person falling from railway vehicle*
A4.3	• *person falling or being hit by loose objects when travelling on board vehicles*
A5	**Fire in Rolling Stock**
A5.1	• *Fire in Rolling Stock*
A5.2	• *Explosion in Rolling Stock*
A6	**Other accident**
A6.1	• *Collision of rail vehicle not forming a train*
A6.2	• *Derailment of rail vehicle not forming a train*
A6.3	• *Electrocution*
A6.4	• *Other accident*
A7	Suicides and attempted suicides
A7.1	• Suicide
A7.2	• Attempted suicide
I	**Incidents**
	Indicators relating to precursors of accidents
I1	**Train Operations Failure**
I1.1	• *Signal passed at danger when passing a danger point*
I1.2	• *Signal passed at danger without passing a danger point*
I2	**Technical Failure of the vehicles**
I2.1	• *Broken wheel on rolling stock in service*
I2.2	• *Broken axle on rolling stock in service*
I2.3	• *Wrong side signalling (vehicle) failure*
I3	**Technical Failure of fixed installations**
I3.1	• *Broken rail*
I3.2	• *Track buckle and other track misalignment*
I3.3	• *Wrong side signalling (infrastructure) failure*

Annex II – Reportable taxonomy

1.	**Occurrence reference number**
2.	**Reporting Entity**
2.1	• Company reference number
2.2	• Reporter reference number
3.	**Occurrence notification status**
3.1	• Initial notification
3.2	• Updated notification
3.3	• Final notification
4.	**Occurrence identification**
4.1	• Date
4.2	• Local Time
4.3	• RUs involved
4.4	• IM involved
5.	**Occurrence category**
5.1	• Accident
5.1.1	○ Serious accident
5.1.2	○ Significant accident
5.2	• Incident
6.	**Occurrence description (free text)**
7.	**Vehicle characteristics**
7.1	• Train type
7.1.1	○ Freight train
7.1.2	○ Passenger train
7.1.2.1	▪ High-speed train
7.1.2.2	▪ Conventional train
7.1.3	○ Engineering train\Maintenance rolling stock
7.2	• Composition
7.2.1	○ Locomotive

7.2.1.1	▪ Diesel
7.2.1.2	▪ Electric
7.2.1.3	▪ Hybrid
7.2.2	○ DMU
7.2.3	○ EMU
7.2.4	○ Wagons
7.2.5	○ Coaches
7.3	• ECM
8	**Infrastructure characteristics**
8.1	○ Location[5]
8.2	○ Country
8.3	○ National Line ID
8.4	○ For occurrence located on a section of line: Operational Points IDs Start and End ○ For occurrence located in an operational point (stations, sidings, switches, etc): Operational Point ID
8.5	○ Track or platform number (when relevant)
8.6	○ Railway location (distance from the origin of the line – for occurrence located on a section of line only)
8.7	○ Geographical coordinates (latitude / longitude)[6]
8.8	○ Type of level crossing involved
8.8.1	▪ Passive level crossing
8.8.2	▪ Active level crossing
8.8.2.1	• manual
8.8.2.2	• automatic with user-side warning
8.8.2.3	• automatic with user-side protection
8.8.2.4	• rail-side protected
9.	**Transport of Dangerous Goods occurrence**
9.1	• Yes

[5] The location details aim to provide a description of the infrastructure equipment. In order to facilitate the reporting, the parameters above (country, National line ID, Operational points, track number and railway location) correspond to existing RINF parameters. These allow then to retrieve all the information related to technical details of the infrastructure already reported in the RINF and will prevent additional reporting of the same information in the future COR system. If some data is not yet available while the implementation phase of the RINF is still on-going, necessary fields could be temporarily added to the taxonomy.

[6] The report of geographical coordinates will allow, in addition with information already included in the RINF, to provide precise geographic visualisation and mapping of occurrences (e.g. mapping of black spots).

9.1.1	○ Dangerous goods are released
9.1.1.1	▪ Yes
9.1.1.2	▪ No
9.2	• No
10.	**Signalling system characteristics**
10.1	• ERTMS
10.2	• Lineside signalling
10.3	• Cab signalling
10.4	• Other
11.	**Environmental relevant factor**
11.1	• Meteorology/Weather
11.1.1	○ Fog
11.1.2	○ Flooding
11.1.3	○ Frost
11.1.4	○ Ice
11.1.5	○ High winds
11.1.6	○ Storm
11.1.7	○ Snow
11.1.8	○ Heat
11.1.9	○ Other
11.2	• Landslide
11.3	• Rock/stone fall
11.4	• Earthquake
11.5	• Vegetation
11.6	• Light conditions
11.7	• Other
12.	**Associated occurrences\Chain of occurrences**[7] Occurrence reference number
13.	**Occurrence consequences** See Taxonomy for consequences

[7] Each occurrence shall be reported under the type of the primary occurrence listed in the Annex I, even if the consequences of the secondary occurrence are more severe. It is however required to report here the full list of occurrence, when relevant, in order to be able to set the chain of occurrences, using the categories listed in Annex I.

14.	**Occurrence causes** See Taxonomy related to identification of causes
15.	**Actions/Measures taken (free text)**
16.	**Link to NIB report (if relevant)**
17.	**Additional relevant information/documents/pictures**
18.	**Shunting Operations (Yes/No)**
18.1	• **Yes**
18.2	• **No**

Taxonomy for Consequences

1.	**Casualties**
1.1	• *Passenger*
1.1.1	○ *Deaths*
1.1.2	○ *Serious injuries*
1.1.3	○ *Light injuries*
1.2	• *Employee or Contractor*
1.2.1	○ *Deaths*
1.2.2	○ *Serious injuries*
1.2.3	○ *Light injuries*
1.3	• *Level Crossing User*
1.3.1	○ *Deaths*
1.3.2	○ *Serious injuries*
1.3.3	○ *Light injuries*
1.4	• *Trespasser*
1.4.1	○ *Deaths*
1.4.2	○ *Serious injuries*
1.4.3	○ *Light injuries*
1.5	• *Other person at a platform*
1.5.1	○ *Deaths*
1.5.2	○ *Serious injuries*
1.5.3	○ *Light injuries*
1.6	• *Other person not at a platform*

1.6.1	○ *Deaths*
1.6.2	○ *Serious injuries*
1.6.3	○ *Light injuries*
2.	**Damage to Environment**
2.1	• *Yes*
2.1.1	○ *Costs*
2.1.2	○ *Description (free text)*
2.2	• *No*
3.	**Material damages to rolling stock**
3.1	• *Yes*
3.1.1	○ *Costs*
3.1.2	○ *Description (free text)*
3.2	• *No*
4.	**Material damages to infrastructure**
3.1	• *Yes*
3.1.1	○ *Costs*
3.1.2	○ *Description (free text)*
3.2	• *No*
5.	**Other Damages**
5.1	• *Yes*
5.1.1	○ *Type*
5.1.1.1	▪ *Structures/Buildings*
5.1.1.2	▪ *Objects*
5.1.1.3	▪ *Cargo*
5.1.1.4	▪ *Other*
5.1.2	○ *Description (free text)*
5.1.3	○ *Costs*
5.2	• *No*
6.	**Delays**
6.1	• *Passenger Trains*
6.1.1	○ *Number of trains*
6.1.2	○ *Number of total minutes*
6.2	• *Freight Trains*
6.2.1	○ *Number of trains*

6.2.2	○ *Number of total minutes*
6.3	• *Overall (sum of passenger and freight trains calculated automatically)*
6.3.1	○ *Number of trains*
6.3.2	○ *Number of total minutes*
6.4	• *Extensive disruption to traffic (Yes/No)*
7.	**Economic Impact of Occurrence** (sum in euro calculated automatically)

Taxonomy related to identification of causes

1	**Train Operations Failure**
1.1	• Signal passed at danger when passing a danger point
1.2	• Signal passed at danger without passing a danger point
1.3	• Runaway train
1.4	• Wrong routing
1.5	• Train over-speeding
1.6	• Loading irregularity
1.6.1	○ Overweight
1.6.2	○ Oversized loading
1.6.3	○ Imbalanced loading
1.6.4	○ Insecure loading
1.6.5	○ Open door
1.7	• Train composition Failure
1.8	• Train available for boarding or alignment outside platform
1.9	• Other (train operation failures)
2	**Technical Failure of the vehicles**
2.1	• Broken wheel on rolling stock in service
2.2	• Broken axle on rolling stock in service
2.3	• Wrong side signalling (vehicle) failure
2.4	• Braking system failure
2.5	• Losing of vehicle parts
2.6	• Traction motor failure (electrical)
2.7	• Diesel engine failure
2.8	• Hot axle box
2.9	• Coupling failure

2.10	• Doors failure
2.11	• Suspension system failure
2.12	• Other (technical failure of the vehicle)
3	**Technical Failure of fixed installations**
3.1	• Broken rail
3.2	• Track buckle and other track misalignment
3.3	• Wrong side signalling (infrastructure) failure
3.4	• Switch and crossing failure
3.5	• Failure of the level crossing equipment
3.6	• Disorder of earthworks/embankment failure
3.7	• Structures failure
3.7.1	○ Tunnel failure
3.7.2	○ Viaduct failure
3.7.3	○ Culvert failures
3.7.4	○ Rail bridge structural failure
3.7.5	○ Over line bridge (e.g. pedestrian) failure
3.7.6	○ Station Structure failure
3.7.8	○ Platform failure
3.8	• Power supply equipment failure
3.9	• Train detection equipment failure
3.10	• Overhead contact line failure
3.11	• Fire of fixed installations
3.12	• Other (technical failure of fixed installations)
4.	**Human and Organisational Performance**
4.1	• ***Human function(s)*** [8] ***involved***

[8] The list of human function has been established following the study on human functions of University of Nottingham made for the Agency in 2013. The report of the human functions involved in an occurrence intends to classify and provide a view of the railway functions involved in the occurrences, in order to better highlight the areas where improvements/actions/measures might be necessary. This should be considered as a first attempt to enhance focus of investigation and report on those areas. Usually, it appears that such information are collected (either directly or indirectly in existing occurrence reporting system – mainly through free text) but rarely classified, undermining the focus of investigation of those areas.
The different human functions listed here are defined in the study and available on Agency's website.
However, in order to be more comprehensive, we recognize that this classification would need to be extended to other functions that might be involved in occurrence, such for instance as technical functions (of equipment) or regulatory functions (from NSAs, the Agency).

4.1.1	• *To provide power for train operations in normal operations, or situations where there are disruptions or engineering work*
4.1.1.1	○ *Take up power control duties*
4.1.1.2	○ *Monitor power*
4.1.1.3	○ *Provision of traction supply*
4.1.1.4	○ *Detect irregularity*
4.1.1.5	○ *Agreement of isolation*
4.1.1.6	○ *Formal agreement for control of the line*
4.1.1.7	○ *Apply isolation*
4.1.1.8	○ *Return of power / remove isolation*
4.1.2	• *To respond to incidents and occurrences, including arrangements for safety and initiation of remedial actions*
4.1.2.1	○ *Detect irregularity*
4.1.2.2	○ *Conduct immediate mitigation, containment*
4.1.2.3	○ *Gather and communicate incident information*
4.1.2.4	○ *Protect work area*
4.1.2.5	○ *Verify work arrangements*
4.1.2.6	○ *Ensure status of infrastructure*
4.1.2.7	○ *Formal agreement for control of the line*
4.1.2.8	○ *Coordinating failure and incident response*
4.1.2.9	○ *Anticipate delay*
4.1.2.10	○ *Re-planning train service*
4.1.2.11	○ *Ensure passenger and personnel safety*
4.1.2.12	○ *Rectifying the incident*
4.1.2.13	○ *Protect evidence*
4.1.3	• *To maintain, repair and extend the infrastructure*
4.1.3.1	○ *Identify engineering work requirements*
4.1.3.2	○ *Establish network access*
4.1.3.3	○ *Formulate work plans*
4.1.3.4	○ *Allocate resources*
4.1.3.5	○ *Formal agreement for control of the line*
4.1.3.6	○ *Verify work arrangements*
4.1.3.7	○ *Protect work area*
4.1.3.8	○ *Supply of resources to site work*
4.1.3.9	○ *Establish safe working environment*

4.1.3.10	○ *Using trains, plant and machinery for engineering work*
4.1.3.11	○ *Close down site on completion of work*
4.1.3.12	○ *Supervision of teams and individuals*
4.1.3.13	○ *Carrying out trackside work*
4.1.4	• *To operate a train in normal operational situations and situations where disruption or problems occur*
4.1.4.1	○ *Ensure authority*
4.1.4.2	○ *Maintain appropriate speed*
4.1.4.3	○ *Ensure train integrity and load integrity on journey*
4.1.4.4	○ *Stopping train*
4.1.4.5	○ *Management of train control systems*
4.1.4.6	○ *Ensure status of infrastructure*
4.1.4.7	○ *Operate level crossing*
4.1.4.8	○ *Warnings to other rail users*
4.1.4.9	○ *Stabling of vehicles*
4.1.4.10	○ *Provide information and support to passengers*
4.1.5	• *To control train movements in all operational circumstances*
4.1.5.1	○ *Take up control of train movement duties*
4.1.5.2	○ *Handover of responsibility*
4.1.5.3	○ *Monitor rail network*
4.1.5.4	○ *Authorise train movements*
4.1.5.5	○ *Route / re-route passenger or freight service*
4.1.5.6	○ *Record train movements*
4.1.5.7	○ *Anticipate delays or poor traffic flow*
4.1.5.8	○ *Deal with irregular train movements*
4.1.5.9	○ *Provide train identification*
4.1.5.10	○ *Manage implementation of emergency / temporary speed restrictions*
4.1.5.11	○ *Gather and communicate information*
4.1.5.12	○ *Control level crossing*
4.1.5.13	○ *Despatch train*
4.1.5.14	○ *Supervision of teams and individuals*
4.1.6	• *To prepare trains for service*
4.1.6.1	○ *Assembling vehicle formation*
4.1.6.2	○ *Preparation of vehicles*

4.1.6.3	○ *Take up driving duties*
4.1.6.4	○ *Loading of freight*
4.1.7	• *Support passenger movements and well-being at stations*
4.1.7.1	○ *Preparing stations for use by passengers*
4.1.7.2	○ *Assisting passengers*
4.1.7.3	○ *Control of crowds*
4.1.8	• *To check, inspect maintain and repair rolling stock for service*
4.1.8.1	○ *Identify rolling stock maintenance requirements*
4.1.8.2	○ *Allocate resources*
4.1.8.3	○ *Prepare rolling stock for inspection*
4.1.8.4	○ *Inspect rolling stock*
4.1.8.5	○ *Handover of responsibility*
4.1.8.6	○ *Installation of components onto vehicles normally in service*
4.1.8.7	○ *Maintenance of components on vehicles normally in service*
4.1.8.8	○ *Servicing of rolling stock*
4.2	• ***Human and organisational factors***[9]
4.2.1	• *Dynamic staff factors*
4.2.1.1	▪ *Expectation / Intention while acting / Decision model / Error type*
4.2.1.2	▪ *Vigilance/ concentration*
4.2.1.3	▪ *Fatigue*
4.2.1.4	▪ *Stress (incl. emotions & psychosocial factors)*
4.2.1.5	▪ *Situational awareness (incl. self-awareness - situational self-knowledge)*
4.2.2	• *Dynamic tasks factors*
4.2.2.1	▪ *Uncertainty-Volatility / Time pressure / Time to respond*

[9] Human and organisational factors aim to identify possible sources of variability that can be considered as part of the causes of an occurrence and which can be considered at all levels of the operational and management processes. This approach is inspired by the research study from Kyriakidis M., on Understanding human performance in sociotechnical systems – Steps towards a generic framework. Safety Sci. (2017), http://dx.doi.org/10.1016/j.ssci.2017.07.008
The approach introduced in the above mentioned study has been adapted to the COR taxonomy needs and taking into account the others parts of the taxonomy (e.g. the section 4 covers the Safety Management System). The need to cover further the "growing conditions" of a safety culture as well as the interactional elements related to it has also lead to additional elements compared to the approach taken as reference.
The terms used here are not further defined in this paper as they are mainly based on standard words and concept. Some explanations are also provided in the article about the research mentioned above. However, if the need for further definition appears necessary, more work can be carried out at a later stage to provide more details.

4.2.2.2	▪ *Complexity-Ambiguity / Autonomy*
4.2.2.3	▪ *Shift pattern (working hours, breaks, manning)*
4.2.2.4	▪ *Working environment (visibility, noise, vibrations, weather,…)*
4.2.3	• *Static Staff Factors*
4.2.3.1	▪ *Familiarity / Individual experiences - job history*
4.2.3.2	▪ *Individual characteristics (incl. self-trust, openness (and others aspects of personality,...))*
4.2.3.3	▪ *Motivation / Commitment (to goal (priorities, risks), to organisation, to rules)*
4.2.3.4	▪ *Fit to work (matching to the requirements of the tasks/activities, health)*
4.2.3.5	▪ *Decision making skills*
4.2.4	• *Static Task Factors*
4.2.4.1	▪ *Technical Communication Means*
4.2.4.2	▪ *Task instructions - Quality of procedures and rules*
4.2.4.3	▪ *User-centered design / Human Machine Interfaces / Levels of automation*
4.2.4.4	▪ *Preventive dispositions and devices*
4.2.4.5	▪ *Societal & Institutional context (regulation, economy, politics, medias, trespassing, sabotage, terrorism…)*
4.2.5	• *Interactional Factors*
4.2.5.1	▪ *Communication (between employees, within organisation)*
4.2.5.2	▪ *Relations (within team, with team-leader, within organisation) - power issues*
4.2.5.3	▪ *Trust in information - in others (management, colleagues, technical means,…)*
4.2.5.4	▪ *Positive - negative reinforcement*
4.2.5.5	▪ *Involvement in decision making*
5.	**Safety Management System**[10]
5.1	• *Leadership*
5.1.1	○ *Leadership and commitment*
5.1.2	○ *Safety Policy*
5.1.3	○ *Organisational roles, responsibilities, accountabilities and authorities*
5.1.4	○ *Consultation of staff and other parties*
5.2	• *Planning*
5.2.1	○ *Actions to address risks*

[10] Following the Commission Delegated Regulation establishing common safety methods on safety management system requirements

5.2.2	○ *Safety objectives and planning*
5.3	• *Support*
5.3.1	○ *Resources*
5.3.2	○ *Competence*
5.3.3	○ *Awareness*
5.3.4	○ *Information and communication*
5.3.5	○ *Documented information*
5.3.6	○ *Integration of human and organisational factors*
5.4	• *Operation*
5.4.1	○ *Operational planning and control*
5.4.2	○ *Asset Management*
5.4.3	○ *Contractors, partners and suppliers*
5.4.4	○ *Management of change*
5.4.5	○ *Emergency management*
5.5	• *Performance evaluation*
5.5.1	○ *Monitoring*
5.5.2	○ *Internal auditing*
5.5.3	○ *Management review*
5.6	• *Improvement*
5.6.1	○ *Learning from accidents and incidents*
5.6.2	○ *Continual improvement*
6.	**Regulatory Framework**
7.	**Security**
7.1	• *Terrorism*
7.2	• *Assault*
7.3	• *Theft*
7.4	• *Arson*
7.5	• *Vandalism*
7.6	• *Cyber attack*
7.7	• *Other (security causes)*
8.	**Other causes**
8.1	• *Design of vehicle*
8.2	• *Design of fixed infrastructure*

8.3	• *Other*

Annex III – Definitions

Definitions from reportable occurrences

‘train’ means one or more railway vehicles hauled by one or more locomotives or railcars, or one railcar travelling alone, running under a given number or specific designation from an initial fixed point to a terminal fixed point, including a light engine, i.e. a locomotive travelling on its own;

‘accident’ means an unwanted or unintended sudden event or a specific chain of such events which have harmful consequences; accidents are divided into the following categories: collisions; derailments; level crossing accidents; accidents to persons involving rolling stock in motion; fires and others;

‘collision of train with rail vehicle’ means a front to front, front to end or a side collision between a part of a train and a part of another train or rail vehicle, or with shunting rolling stock;

‘collision of train with obstacle within the clearance gauge’ means a collision between a part of a train and objects fixed or temporarily present on or near the track (except at level crossings if lost by a crossing vehicle or user), including collision with overhead contact lines;

‘derailment of train’ means any case in which at least one wheel of a train leaves the rails;

‘level crossing accident’ means any accident at level crossings involving at least one railway vehicle and one or more crossing vehicles, other crossing users such as pedestrians or other objects temporarily present on or near the track if lost by a crossing vehicle or user;

‘accident to persons involving rolling stock in motion’ means accidents to one or more persons who are either hit by a railway vehicle or by an object attached to, or that has become detached from, the vehicle, this includes persons who fall from railway vehicles as well as persons who fall or are hit by loose objects when travelling on board vehicles;

‘fire in rolling stock’ means a fire that occurs in a railway vehicle (including its load) when it is running between the departure station and the destination, including when stopped at the departure station, the destination or intermediate stops, as well as during re-marshalling operations;

‘explosion in rolling stock’ means an explosion that occurs in a railway vehicle (including its load) when it is running between the departure station and the destination, including when stopped at the departure station, the destination or intermediate stops, as well as during re-marshalling operations;

‘other (accident)’ means any accident other than a collision of train with rail vehicle, collision of train with obstacle within the clearance gauge, derailment of train, level crossing accident, an accident to person involving rolling stock in motion or a fire in rolling stock;

‘Collision of rail vehicle not forming a train’ means any collision between rail vehicle used on rail tracks where none of the vehicle involved forms a train according to the definition mentioned above. This includes collision of shunting rolling stock/maintenance machines, including those on tracks for maintenance operations;

‘Derailment of rail vehicle not forming a train’ means any derailment of rail rolling stock used on rail tracks but not forming a train according to the definition mentioned above. This includes derailment of shunting rolling stock/maintenance machines, including those on tracks for maintenance operations;

'Electrocution' - Pathological consequences caused in a human body by the passage of an electric current; or 'Electrocution' - The injury or killing of someone by a sudden discharge of electricity through a part of the body.

‘incident’ means any occurrence, other than an accident or serious accident, affecting the safety of railway operations;

‘Failure’ means defect, construction non-conformities, malfunctions or any other irregularity that endangers, or has the potential to endanger, the safety of railway operations.

‘Signal Passed at Danger when passing a danger point’ means any occasion when any part of a train proceeds beyond its authorised movement and travels beyond the danger point;

‘Signal Passed at Danger without passing a danger point’ means any occasion when any part of a train proceeds beyond its authorised movement but does not travel beyond the danger point.
Unauthorised movement means to pass:
— a trackside colour light signal or semaphore at danger, or an order to STOP where a train protection system (TPS) is not operational,
— the end of a safety-related movement authority provided in a TPS,
— a point communicated by verbal or written authorisation laid down in regulations,
— stop boards (buffer stops are not included) or hand signals.
Any case in which a vehicle without any traction unit attached or a train that is unattended runs away past a signal at danger is not included. Any case in which, for any reason, the signal is not turned to danger in time to allow the driver to stop the train before the signal is not included.

‘Danger point’ means the point or the area (e.g. a switch at a junction of railway lines) beyond a signal that this signal is protecting from the operation of trains over this point or area when presenting the ‘danger’ indication.

‘Broken wheel on rolling stock in service’ - A break affecting the wheel and creating a risk of accident.

‘Broken axle on rolling stock in service’ - A break affecting the axle and creating a risk of accident.

‘Broken rail’ - Any rail which is separated in two or more pieces, or any rail from which a piece of metal becomes detached, causing a gap of more than 50 mm in length and more than 10 mm in depth on the running surface.

‘Track buckle or other track misalignment’ means any fault related to the continuum and the geometry of track, requiring track to be placed out of service or immediate restriction of permitted speed;

‘Wrong side signalling (vehicle) failure’ means any technical failure of a signalling system to rolling stock, resulting in signalling information less restrictive than that demanded;

‘Wrong side signalling (infrastructure) failure’ means any technical failure of a signalling system to infrastructure, resulting in signalling information less restrictive than that demanded;

Definitions from the taxonomy

'shunting'[11] means a movement of a rail vehicle or set of rail vehicles inside a railway station or other railway installations such (depot, workshop, marshalling yard, etc.);
'serious accident' means any train collision or derailment of trains resulting in the death of at least one person or serious injuries to five or more persons or extensive damage to rolling stock, the infrastructure or the environment, and any other accident with the same consequences which has an obvious impact on railway safety regulation or the management of safety; 'extensive damage' means damage that can be immediately assessed by the investigating body to cost at least EUR 2 million in total;

'significant accident' means any accident involving at least one rail vehicle in motion, resulting in at least one killed or seriously injured person, or in significant damage to stock, track, other installations or environment, or extensive disruptions to traffic, excluding accidents in workshops, warehouses and depots;

'Significant damage to stock, track, other installations or environment' means damage that is equivalent to EUR 150 000 or more;

'Extensive disruptions to traffic' means that train services on a main railway line are suspended for six hours or more;

'Main railway line' comprise the high speed railway lines and important major conventional railway lines as defined by national or international authorities;

'Passenger' means any person, excluding a member of the train crew, who makes a trip by rail, including a passenger trying to embark onto or disembark from a moving train for accident statistics only;

'employee or contractor' means any person whose employment is in connection with a railway and is at work at the time of the accident, including the staff of contractors, self-employed contractors, the crew of the train and persons handling rolling stock and infrastructure installations;

'Level crossing user' means any person using a level crossing to cross the railway line by any means of transport or by foot;
'Trespasser' means any person present on railway premises where such presence is forbidden, with the exception of a level crossing user;

'other person at a platform' means any person at a railway platform who is not defined as 'passenger', 'employee or contractor', 'level crossing user', 'other person not at a platform' or 'trespasser';
'other person not at a platform' means any person not at a railway platform who is not defined as 'passenger', 'employee or contractor', 'level crossing user', 'other person at a platform' or 'trespasser';

'Death (killed person)' means any person killed immediately or dying within 30 days as a result of an accident, excluding any suicide;

'Serious injury (seriously injured person)' means any person injured who was hospitalised for more than 24 hours as a result of an accident, excluding any attempted suicide.

[11] This definition is aligned with the definition proposed by Eurostat in its glossary that can be found here: http://ec.europa.eu/eurostat/documents/3859598/5911341/KS-RA-10-028-EN.PDF/6ddd731e-0936-455a-be6b-eac624a83db4

‘Light injury’ means any person injured who was hospitalised for less than 24 hours as a result of an accident or incident, excluding any attempted suicide.

‘Occurrence involving the transport of dangerous goods’ means any accident or incident that is subject to reporting in accordance with RID (1)/ADR Section 1.8.5;

‘Dangerous goods’ means those substances and articles the carriage of which is prohibited by RID, or authorised only under the conditions prescribed therein.

‘Suicide’ means an act to deliberately injure oneself resulting in death, as recorded and classified by the competent national authority;

‘Attempted suicide’ means an act to deliberately injure oneself resulting in serious injury.

‘Cost of damage to environment’ means costs that are to be met by Railway Undertakings and Infrastructure Managers, appraised on the basis of their experience, in order to restore the damaged area to its state before the railway accident.

‘Cost of material damage to rolling stock or infrastructure’ means the cost of providing new rolling stock or infrastructure, with the same functionalities and technical parameters as that damaged beyond repair, and the cost of restoring repairable rolling stock or infrastructure to its state before the accident, to be estimated by Railway Undertakings and Infrastructure Managers on the basis of their experience, including also costs related to the leasing of rolling stock, as a consequence of non-availability due to damaged vehicles.

‘Cost of delays as a consequence of accidents’ means the monetary value of delays incurred by users of rail transport (passengers and freight customers) as a consequence of accidents, calculated by the CSI model.
‘Level crossing’ means any level intersection between a road or passage and a railway, as recognised by the infrastructure manager and open to public or private users. Passages between platforms within stations are excluded, as well as passages over tracks for the sole use of employees.

‘Road’ means, for the purpose of railway accident statistics, any public or private road, street or highway, including adjacent footpaths and bicycle lanes.

‘Passage’ means any route, other than a road, provided for the passage of people, animals, vehicles or machinery.

‘Passive level crossing’ means a level crossing without any form of warning system or protection activated when it is unsafe for the user to traverse the crossing.

‘active level crossing’ means a level crossing where the crossing users are protected from or warned of the approaching train by devices activated when it is unsafe for the user to traverse the crossing.
Protection by the use of physical devices includes: half or full barriers gates.
Warning by the use of fixed equipment at level crossings: visible devices: lights, audible devices: bells, horns, klaxons, etc.
Active level crossings are classified as:
(a) Manual: a level crossing where user-side protection or warning is manually activated by a railway employee.
(b) Automatic with user-side warning: a level crossing where user-side warning is activated by the approaching train.
(c) Automatic with user-side protection: a level crossing where user-side protection is activated by the

approaching train. This shall include a level crossing with both user-side protection and warning.
(d) Rail-side protected: a level crossing where a signal or other train protection system permits a train to proceed once the level crossing is fully user-side protected and is free from incursion.

Annex IV – INTERESTED PARTIES

List of interested parties which may receive information on the basis of a case-by-case decision under paragraph 5.6:

1. Railway undertakings and infrastructure managers;
2. Entities in charge of maintenance;
3. Manufacturers;
4. Maintenance supplies, keepers, service providers, contracting entities, carriers, consignors, consignees, loaders, unloaders, fillers and unfillers;
5. ECM certification bodies, NoBo, DeBo, AsBo.
6. Railway training organisations;
7. Third-country organisations: governmental railway authorities and accident investigation authorities from third countries;
8. International railway organisations;
9. Research: public or private research laboratories, centres or entities; or universities engaged in railway safety research or studies.

Annex V – REQUEST FOR INFORMATION FROM THE EU COR IT TOOL

1. Full name:

   Function/position:

   Company:

   Address:

   Country:

   Tel.:

   E-mail:

   Nature of business:

   Category of interested party (see Annex IV):

2. Information requested (please be as specific as possible; include the relevant date/period in which you are interested): free text
3. Reason for the request: free text
4. Explain the purpose for which the information will be used: free text
5. Date by which the information is requested:
6. The completed form should be sent, via e-mail, to: (point of contact)
7. Access to information

The point of contact is not required to supply any requested information. It may do so only if it is confident that the request is compatible with applicable rules. The requestor commits itself and its organisation to restrict the use of the information to the purpose it has described under point 4. It is also recalled that information provided on the basis of this request is made available only for the purposes of railway safety and not for other purposes such as, in particular, attributing blame or liability or for commercial purposes.

The requestor is not allowed to disclose information provided to it to anyone without the written consent of the point of contact.

Failure to comply with these conditions may lead to a refusal of access to further information from the EU COR IT Tool and, where applicable, to the imposition of penalties from the concerned Member states.

8. Date, place and signature:

Annex VI – Comment sheet

Document Review – Comment Sheet

Document commented:

Requestor:	The Agency
Deadline for submitting comments:	

	Reviewer 1	*Reviewer 2*	*Reviewer 3*	*Reviewer 4*	*Reviewer 5*
Date:					
Name:					
Organisation:					
Email:					
Do you agree on the publication of your comments on the ERA Extranet space related to COR project? (Yes/No): YES					

Document History

Version	*Date*	*Comments*
0.1		First draft for external comments

Conventions:

Type of Comment		*Reply by requestor*	
G	General	*R*	Rejected
M	Mistake	*A*	Accepted
U	Understanding	*D*	Discussion necessary
P	Proposal	*NWC*	Noted without need to change

Review Comments <if necessary add extra lines in the table>

N°	*Reference (e.g. Art, §)*	*Type*	*Reviewer*	*Reviewer's Comments, Questions, Proposals*	*Reply*	*Proposal for the correction or justification for the rejection*
1.						
2.						
3.						

Note: This table could be changed according to the requestor's needs