

CYbersecurity in the RAILway sector

D1.1 – Project Quality Assurance Plan

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Leader of this Deliverable: EVOLEO

Reviewed: CCS

Document status		
Revision	Date	Description
001	26-11-2016	First Draft of Document by EVOLEO
002	02-12-2016	Review by CCS
003	07-12-2016	First Issued version by EVOLEO
004	22-02-2018	Updated with the following information <ul style="list-style-type: none"> - Document template with EU emblem - Added STC details to the management structure - Deliverables review process with interaction timings - External communication channels - Risk management detailed with identified risks, management processes and measures

Start date of project: 01/10/2016

Duration: 24 months

REPORT CONTRIBUTION

Name	Company	Details of contribution
Sara Freitas	EVOLEO	First Draft released
Pedro Ribeiro	EVOLEO	Technical Contributions
Cecile Abdo	CCS	Document Review and Suggestions
Magno Santos	EVOLEO	Document Approved

Objectives of the Deliverable

The D1.1 – Project Quality Assurance Plan intends to describe the project management structure and define suitable quality management processes, including mechanisms to review internal reports and deliverables to ensure that the scientific and technical activities of the project are accomplished successfully and in compliance with the quality standards.

The main objectives of the deliverable comprise:

- Promote the effective discussion on scientific and technical issues between partners;
- Define the overall monitoring of the progress of the activities and the accomplishment of Milestones;
- Specify the contribution to the elaboration/revision of the project deliverables;
- Guarantee the scientific and technical quality of the results/deliverables.

Additionally, this document also describes the information flow and revisions steps of the deliverables as the external project communication.

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1. INTRODUCTION

This D1.1 Project Quality Assurance Plan describes the processes in order to ensure that the scientific and technical activities of the project are accomplished successfully and in compliance with the quality standards

This document is divided into three main chapters:

- Structure management description including the Advisory Board and Scientific Technical Committee
- Progress monitoring processes including deliverables reviews, project meetings and risk management
- Information flow including internal communication related to documentation and mailing lists, as external communication and inter-projects cooperation.

2. TERMINOLOGY TO BE USED IN THE DOCUMENT

CYRail – CYbersecurity in the RAILway sector

IPR – Intellectual Property Rules

NA – Not Applicable

PA – Product Assurance

PAB – Project Advisory Board

PC – Project Coordinator

STC – Scientific and Technical Committee

WP – Work Package

3. MANAGEMENT STRUCTURE

The CYRail Consortium is comprised of a well-balanced group of 6 partners from 5 European countries (Portugal, Spain, France, Germany and Sweden) with complementary skills and expertise.

To ensure clear governance and straightforward procedures in CYRail’s different activities, a workflow structure has been defined, as illustrated in the below figure.

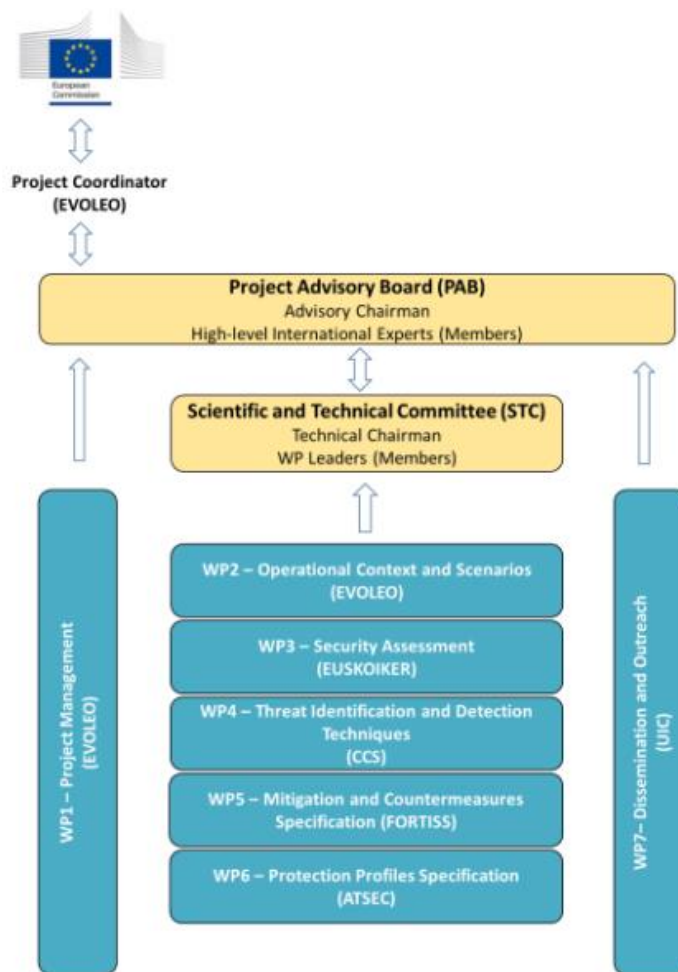


Figure 3-1 – General Management Structure of CYRail project.

3.1 ADVISORY BOARD

CYRail’s Advisory Board comprises a high-level international panel of experts from different areas of knowledge that will provide an additional form of quality control, advice, and validation of the vision, global impact and outreach of the project.

Members of the winning consortium for the topic “S2R-CFM-IP2-01-2015: Start-up activities for advanced signalling and automation system” were invited for the Advisory Board and as such will participate in regular meetings with the CYRail consortium.

The Advisory Board communicate with the STC throughout the project lifetime and make use of their networks to disseminate and exploit the project results, at the European and international level.

The representatives of the Advisory Board plan to attend in CYRail Project Advisory Board Meetings along with consortium members in months 6, 9, 18 and 24.

TheErro! A origem da referência não foi encontrada. Table 3-1 shows the advisory board members to CYRAIL project.

Entity	Contact Name	Email
EUROC	Manuel Martins	manuel.martins@infraestruturasdeportugal.pt
IPTTELECOM	José Gonçalves	jose.sgoncalves@iptelecom.pt
ADIF	Alfonso Díez Pérez	adiez@adif.es
Alstom (X2Rail)	Francois Hausman	francois.hausman@transport.alstom.com
Thales (X2Rail)	Claudia Lutze	claudia.lutze@thalesgroup.com
NetworkRail	Darren Hepburn	darren.hepburn@networkrail.co.uk
IFSTTAR	Christophe Gransart	christophe.gransart@ifsttar.fr
ANSSI	Kasmi Chaouki	chaouki.kasmi@ssi.gouv.fr
ENISA	Rossella Mattioli	rossella.mattioli@enisa.europa.eu
SNCF	Yseeult Garnier	yseult.garnier@reseau.sncf.fr
DB	Christian Schlehuber	Christian.Schlehuber@deutschebahn.com

Table 3-1 - Advisory Board members

3.2 SCIENTIFIC AND TECHNICAL COMMITTEE (STC)

The STC is composed by the R&DI partners, including WP leaders and is chaired by EVOLEO. Its main responsibility will be to ensure that the scientific and technical activities of the project are accomplished successfully and in compliance with the quality standards.

The CYRail STC is composed by consortium members that don’t contribute directly in the execution of deliverables and by members who have an appropriate curriculum but are not part of consortium.

The STC will also have the overall responsibility for protection and management of IPR of the project results.

3.3 IPR POLICY

The Intellectual Property Rights (IPR) policy of CYRail project is handled in line with general EC policies regarding ownership, exploitation rights, confidentiality, availability of information, deliverables, etc., to other EU funded projects and disclaiming rules.

The rules applied for the management of intellectual property within the frame of CYRail project and for the future exploitation of project's results are fully compatible with the Grant Agreement and are specified in the IPRs Consortium Agreement.

The IPR policy of the CYRail project will be monitored by the coordinator.

4. PROGRESS MONITORING

The CYRail project is structured around 7 Work Packages (WPs) with a total duration of 24 months according to the structure shown below:

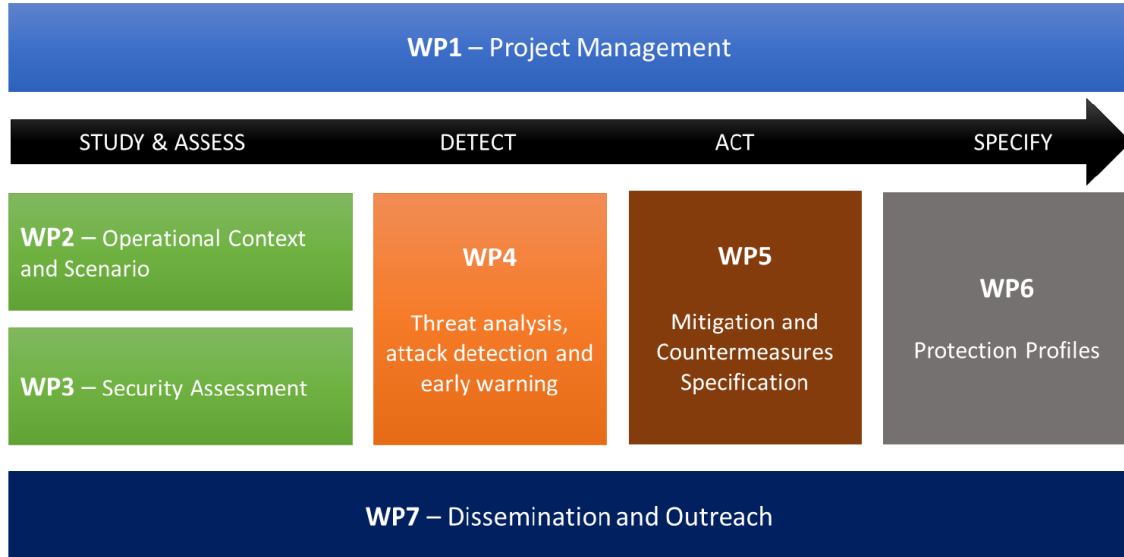


Figure 4-1 – Work packages structure.

Project reports should be the main instrument serving as practical measurement of project progress on a regular basis.

WP leaders manage and monitor the progress of the tasks of their WP through a continuous intermediation with the Task Leaders.

Each WP leader reports on the progress of their WP to the Project Coordinator (PC) and in the consortium meetings, and will be responsible for the detailed planning of the subtasks and activities identified, coordinating the work performed and information flow required by the various interdependencies.

The WP leaders, collect, compile and submits consolidated technical and financial details in the form of ‘Periodic Reports’, every 12 months. They should also inform the Scientific and Technical Committee (STC) and the Project Advisory Board (PAB) on the progress achieved, results obtained and problems encountered before every consortium meeting and participate in the preparation of the Review Meetings with the Commission.

4.1 DELIVERABLES

Each work package leader is responsible for each deliverable and responsible for ensuring that the deliverable meets the quality assurance requirements.

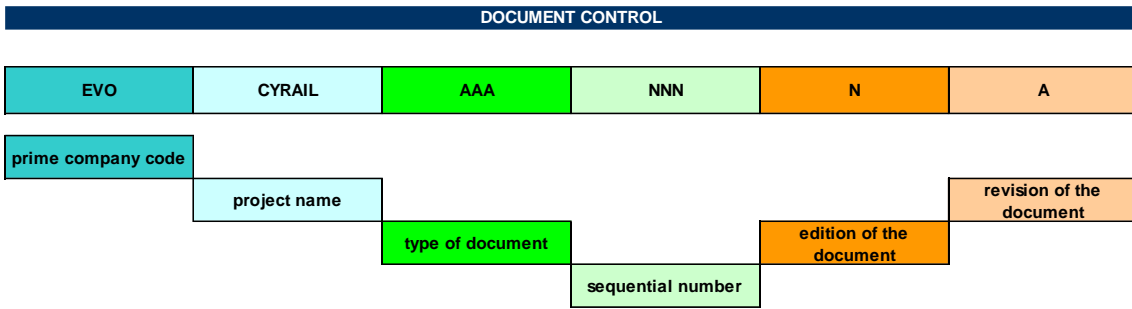
The Project Coordinator (PC) should ensure that the deliverables are prepared in due time. As such, the deliverables should be sent for approval by the Due Date Month as in the table Below.

ID	Deliverable name	WP	Lead Part.	Type	Dissem. lev	Delivery date
D1.1	Project Quality Assurance Plan	1	EVOLEO	R	CO	3
D1.2	Data Management Plan	1	EVOLEO	R	CO	6
D2.1	Safety and security requirements of rail transport system in multi-stakeholder environments	2	EVOLEO	R	CO	9
D2.2	Operational scenario description	2	UIC	R	CO	12
D3.1	Security Assessment Methodology for the railway domain	3	EUSKOIKER	R	CO	6
D3.2	Security Analysis and Vulnerability list of the use cases	3	EVOLEO	R	CO	12
D3.3	Risk Analysis of the use cases	3	EUSKOIKER	R	CO	22
D4.1	Threat identification and analysis report	4	CCS	R	CO	14
D4.2	Early attack and anomaly detection report	4	FORTISS	R	CO	16
D4.3	Enhanced alerting and collaborative incident management report	4	CCS	R	CO	18
D5.1	Mitigation and Countermeasures Specifications	5	FORTISS	R	CO	22
D5.2	Description of resilience mechanisms	5	EUSKOIKER	R	CO	18
D6.1	Specifications and Assurance levels of Protection Profiles	6	ATSEC	R	PU	24
D7.1	Communication and Exploitation Plan - first version	7	UIC	R	PU	6
D7.2	Website and Private Workspace	7	UIC	DEC	PU	2
D7.3	4-page Brochure (Project Presentation)	7	UIC	DEC	PU	2
D7.4	Communication and Exploitation Plan - Final version	7	EVOLEO	R	PU	20
D7.5	Recommendations Brochure	7	UIC	DEC	PU	24

Table 4-1 - CYRail deliverables

Work in Progress Deliverables which are documents, are shared by Office 365, with an edition link, so that everyone one involved can actively contribute. Documents will be edited in “Track changes” mode so that the leader of the deliverable can clearly identify updates performed on the document by other partners.

All the documentation developed under the project, will be referenced according to the following table:



All documents are present in a list of documents and controlled by Product Assurance (PA) manager. This list allows the control and management of the documents associated with the project.

The following figure shows the document control list:

DOCUMENT LIST

Company	Project	Type	Sequential number	Edition	Revision	Area	Name	Emission date	State	Author	Link	Notes
AAA-AAA	AAAAA	AAA	NNN	N	A							
EVO	CYRAIL	DL	001	1		MNG	Document list	2016/10/14	In execution	SF	-	

All the revisions are clearly identified within the document.

The following figure shows the document review flowchart:

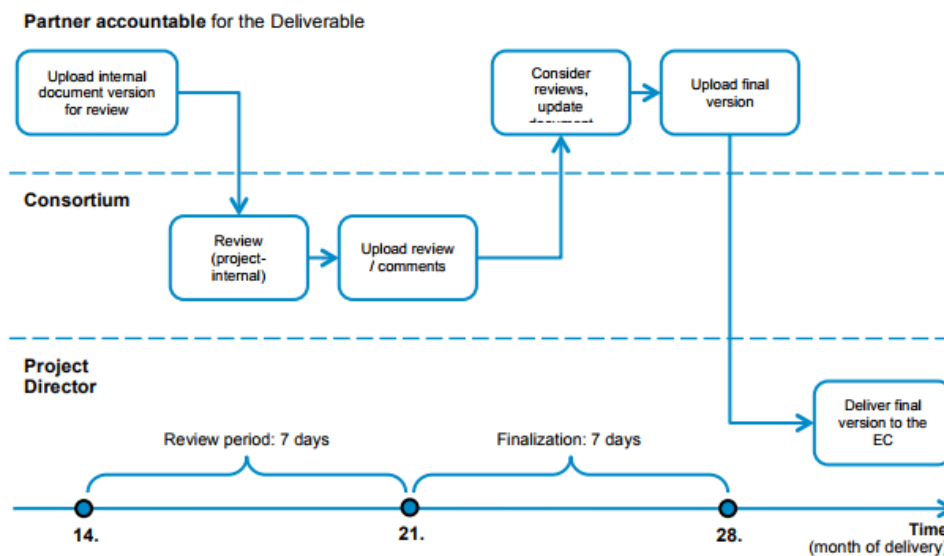


Figure 4-1 - Document review flowchart.

After the deliverable conclusion, the responsible of the deliverable shall make available to the consortium for review.

The review panel is constituted by consortium members which will provide review comments and proposals for updates within 7 days.

The derivable is updated according the reviews within 7 days and provided to the project coordinator by uploading to the official project repository workspace.

- <http://extranet.uic.org/>

Once closed, the document final version will be submitted to the European Commission.

4.2 PROJECT MEETINGS

Discussions and brainstorming sessions in the consortium meetings are explored to incorporate in CYRail potential new research and technical developments, as well as to update, if necessary, the needs identified by the end user's partners.

There will be regular CYRail Consortium meetings (expected every 3 months) which will involve all partners and enable them to get together to receive a briefing on the project's status and coordinate the project's management and technical work.

The foreseen regular CYRail project meetings include:

- project work progress meeting every two weeks (conference call).
- work progress face to face meeting every three months.

4.3 RISK MANAGEMENT

The risk factors related to project implementation have been identified. For each risk, mitigation strategies are proposed. The implementation of each risk-mitigation measure will be tightly controlled by the responsible management body.

The CYRail risk management process includes identification, mitigation and action plans to reduce and/or eliminate any risk that may arise. It will comprise the following steps:

- Description of risk
- WP(s) allocation
- Severity
- Probability
- Proposed Risk Mitigation Measures

The purpose of the risk mitigation planning is to reduce the impact or the probability for the event to occur, to a level that can be managed by the project. It determines when and what needs to be done to reduce or eliminate the risk.

There are two main categories of risks:

- Operational –
- Technical – technical objectives are in danger or cannot be fulfilled.

The continuous risk management process is based on early identification and fast reaction to events that can negatively affect the outcome of the project. The frequent meetings of the project bodies therefore serve as the main forum for risk identification. The identified risks are then analysed and graded, based on impact and probability of occurrence.

The risks are defined by WP. In some cases, a risk can be associated with more than one WP.

The risk ‘owner’ is associated with WP Leader. Each WP leader is responsible for managing the risks associated with your WP.

The next tables show the critical operational and technical risks and Mitigating Actions.

Description of risk	WP(s)	Severity	Probability	Proposed Risk Mitigation Measures
Limited coordination among partners/ WPs/ tasks	All WPs	High	Low	EVOLEO has extensive experience in coordinating large projects, and thus will ensure the necessary respect for interdependencies. Effective coordination is ensured by the management structure. Other key partners within CYRail are experienced project coordinators as well and can support EVOLEO if needed.
Delay in implementation of tasks	All WPs	High	Low	The PC will conduct a strict management of tasks against the allocated time. Moreover, regular online meetings will be held (at least every 3 months) to discuss the progress of the work and to redefine the tasks if necessary. Also, partners have experience in working in collaborative projects and are fully committed to duly implement the tasks they are assigned to.
Limited visibility of the project among stakeholders	7	High	Low	The consortium has dedicated WP7 to ensure effective dissemination and outreach of CYRail’s activities. The effectiveness of the implementation of communication and dissemination activities will be monitored on a regular basis. The activities planned will be adapted, if necessary, so as to better target the

				messages to stakeholders, thus maximising their impact.
Difficulty in ensuring	7	High	Low	All project partners will be required to participate in the development of the sustainability plan. Pipeline management should be ensured during the project lifespan

Table 4-2 - Critical Operational Risks identified and Mitigating Actions.

Description of risk	WP(s)	Severity	Probability	Proposed Risk Mitigation Measures
The operational scenario is not comprehensive enough for the risk assessment	WP2	Medium	Low	The workshop organised in M6 will involve experts from various public transport companies to ensure that the most important elements are included in the scenario.
Difficulty to achieve targeted security level due to technological limitations.	WP3	Medium	Low	Strong interaction with other industry sectors with critical infrastructure such as aerospace, automotive and energy with similar technology challenges.
Diversity of Signalling and control systems can lead to an inefficient anomaly detection.	WP4	Low	Medium	Interaction with Signalling suppliers and/or experts can provide a deeper insight on the diversity of signalling system and their expected behavioural differences.
Convergence issue on alerting formats	WP4	Low	High	Due to cultural and organizational cleavages, it may be difficult to obtain an agreement on incident reporting and alerting formats from different SOC operators involved in different transportation segments.
Mitigation mechanisms from other domain do not apply	WP5	Medium	Low	Due to large amount of research in diverse safety-critical areas, such as aerospace, automotive and medical, many options exist. The mitigation approach in the project is to extend the reach to other domains and secondly, if needed, limit the scope the security profiles
Inapplicability of documentation provided as input to WP 6 is not sufficient to specify Protection Profile.	WP6	Medium	Low	Partner involved in WP6 are also involved in WP3, WP4 and WP5 to ensure that the provided input is sufficient to developer Protection Profiles
Security Requirements specified in the Protection Profile are not applicable for rail systems.	WP6	Medium	Low	WP2 includes a comprehensive analysis of the existing rail system. An operational transport scenario will be proposed for further security assessments in WP3, WP4 and WP5. In WP6.3the compliance to the Protection Profile will be checked for the operational scenario described in WP2.

Table 4-3 - Critical Technical Risks identified and Mitigating Actions

5. INFORMATION FLOW

5.1 PROJECT DOCUMENTATION

Dedicated templates will be used for uniform internal and/or external presentations of the project. The office 365 (support by EVOLEO) should be used to elaborate the deliverables.

5.2 PROJECT MAILING LISTS

Email will be the most common way of exchange between all consortium members.

For a better organisation of the internal communication, it was created the following email:

cyrail@cyrail.eu

- Repositories

A repository (extranet) was created to share documentation, among partners. Each partner user will have a unique ID and Password to ensure confidentiality of the deliverables. The extranet link is the following: <http://extranet.uic.org/>

5.3 EXTERNAL COMMUNICATION

The external communication of the project is done through Website, activities of dissemination and Cooperation with X2Rail-1 Project.

5.3.1 Website

To share projects results, news, and information to the public, a project website was created with the link <http://cyrail.eu>

5.3.2 Conferences

Participation in international conferences: UIC ERTMS world conference, TRA, WCRR, amongst others.

5.3.3 Cooperation with X2Rail-1 Project

The following table provides the exchanged information between CYRail and X2RAIL-1.

#	Exchanged information	Provisional planning	PIC
1	Hold a periodic coordination meeting Mandatory participating members: Coordinators Optional participating members: task leaders and experts on specific subjects.	About every 3 months	CYRail and X2RAIL-1
2	Participate to CYRail periodic advisory board List of WP8 members participating to the advisory board: <ul style="list-style-type: none"> • Alstom (WP8 coordinator) • Thales • NR • Railenium 	About every 3 months	X2RAIL-1
3	Agree on security assessment approaches	March 2017	CYRail and X2RAIL-1
4	Provide a survey of the security by design approaches in the other industries.	May 2017	CYRail
5	CYRail to deliver the 1 st release of the threat taxonomy (focus on communications and operational scenarios)	June 2017	CYRail
6	Provide the “selection of the “security-by-design” standard” report	July 2017	X2RAIL
7	Provide intermediate release of security assessment focusing on communication and operational scenarios	February 2018	CYRail
8	Provide global security assessment, including railway common agreed threat taxonomy	March 2018	X2RAIL-1
9	Provide threat detection, prevention and response/mitigation report focusing on communication part and operational scenarios	June 2018	CYRail
10	Deliver allocated security profile specifications	July 2018	CYRail and X2RAIL
11	Provide global threat detection, prevention and response/mitigation report.	August 2018	X2RAIL

Table 5-1 - Information between CYRail and X2RAIL-1.