



Deliverable D 5.1 Quality Plan

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1. Executive Summary

The aim of this document is to provide consortium members with quality guidelines regarding the project results. Those guidelines include also templates for presentation of the project results, as well as processes for a good communication between partners, a definition of the role of the key persons involved in Quality on the project, and process for insuring quality in the production of the Deliverables and other dissemination material.

2. List of acronyms

EC	European Commission
PC	Project Coordinator
PPR	Project Periodic Report
PRS	Partners from the Railway Sector
QRM	Quality and Risk Manager
CA	Consortium Agreement
GA	Grant Agreement
IPR	Intellectual Property Rights
IFSTTAR	Institut Français des Sciences et Technologies des Transports, de l'aménagement et des réseaux
DTU	Danmarks Tekniske Universitet
IKL	IKERLAN, S Coop.
RDL	RadioLabs
ULille	University of Lille
MdM	Metro de Madrid. S.A.
EURNEX	EURNEX e.v.

3. Background

This document constitutes the first issue of Deliverable D5.1 "Quality Plan" according to Shift2Rail Joint Undertaking programme of the project titled "EMULATION OF RADIO ACCESS TECHNOLOGIES FOR RAILWAY COMMUNICATIONS" (Project Acronym: EMULRADIO4RAIL , under Grant Agreement No 826152).

In December 2018, the European Commission awarded a grant to the EMULRADIO4RAIL consortium of the Shift2Rail / Horizon 2020 call (H2020-S2RJU-OC-2018 S2R-CFM-IP2-01-2015).

EMULRADIO4RAIL is a projected connected to the development of a new Communication System planned within the Technical Demonstrator TD2.1 of the 2nd Innovation Programme (IP2) of Shift2Rail JU: Advanced Traffic Management & Control Systems. The G A 826152



IP2 “Advanced Traffic Management & Control Systems” is one of the five asset-specific Innovation Programmes (IPs), covering all the different structural (technical) and functional (process) sub-systems related to control, command and communication of railway systems.

4. Objective/Aim

The present document constitutes the Deliverable D5.1, its aim is to provide consortium members with guidelines as to the quality process on the project. Quality will be assessed and corrective actions taken through the lifetime of the project at the occasion of each General Assembly, by the partner in charge of Quality, IKERLAN.

The document will serve to the team leaders within each organisation, researchers and administrative responsible to have at any moment a clear repository of the different tools available to enable the exchange of information and management of the project.

As any other document in the project, this deliverable should not contradict the project contract – and in particular the provisions made at the DoA (Description of Actions) with regards to Quality Management and Risk Management – and the Consortium Agreement signed by all partners.

The document is split in 4 parts: one listing good communication practices within the project and outside, tools to use, one on reporting procedures, one on quality management and the last on Risk management. The document includes a list of templates to be used within the project, and a table of reviewers for the deliverable so as to insure quality of the deliverables.

5. Communication Guidelines

5.1. Contacts list

A contact list is built and will list all people involved in the project, with their contact information. The list is made available to all partners, at the root of a shared folder on a specific server located at IFSTTAR.

5.2. Communication

Communication will normally take place via e-mail, telephone and web-conference.

5.3. Mailing lists

A mailing list using a collaborative tool from IFSTTAR has been created for consortium members. The mailing address is: emulradio4rail-request@listes.ifsttar.fr

A list of registered persons that can use the email address is managed by Marion Berbineau. Non-member of the list can use the list but will be moderated.

Additional mailing lists may be created on request by contacting Marion Berbineau.

5.4. Document Interchange Format

All the text documents exchanged within the project must observe the following rules:

- Format *.docx/doc (Word or equivalent). A template is available in the repository.
- Track of changes is activated. Use of built-in comments in Word or Acrobat is recommended.
- After the final document has passed the peer review, the Project Coordinator submitting the document to the EC will generate the PDF file.
- Attachments should not be sent to mailing lists but rather placed on the project repository. Then, the person who has uploaded the document will notify it via e-mail to the appropriate mailing list, announcing the location where the document can be retrieved.
- A logical structure of the repository has been organised in order to facilitate the retrieval of all the documents. All the partners will continue using this structure and create new directories in the same logical way whenever it is needed.
- The presentations will use the *.pptx/ppt format (or equivalent) according to a template available in the repository.
- All the documents to be forwarded outside the Consortium, including the presentations and the final deliverables, will use ONLY PDF format, properly secured and authorizing only printing, no editing, no copy and no annotation.
- The deliverables and other documents intended for not only internal use must follow the format and styles indicated in the template available in the corresponding section of EmulRadio4Rail repository.
- These templates can evolve according to the project needs.

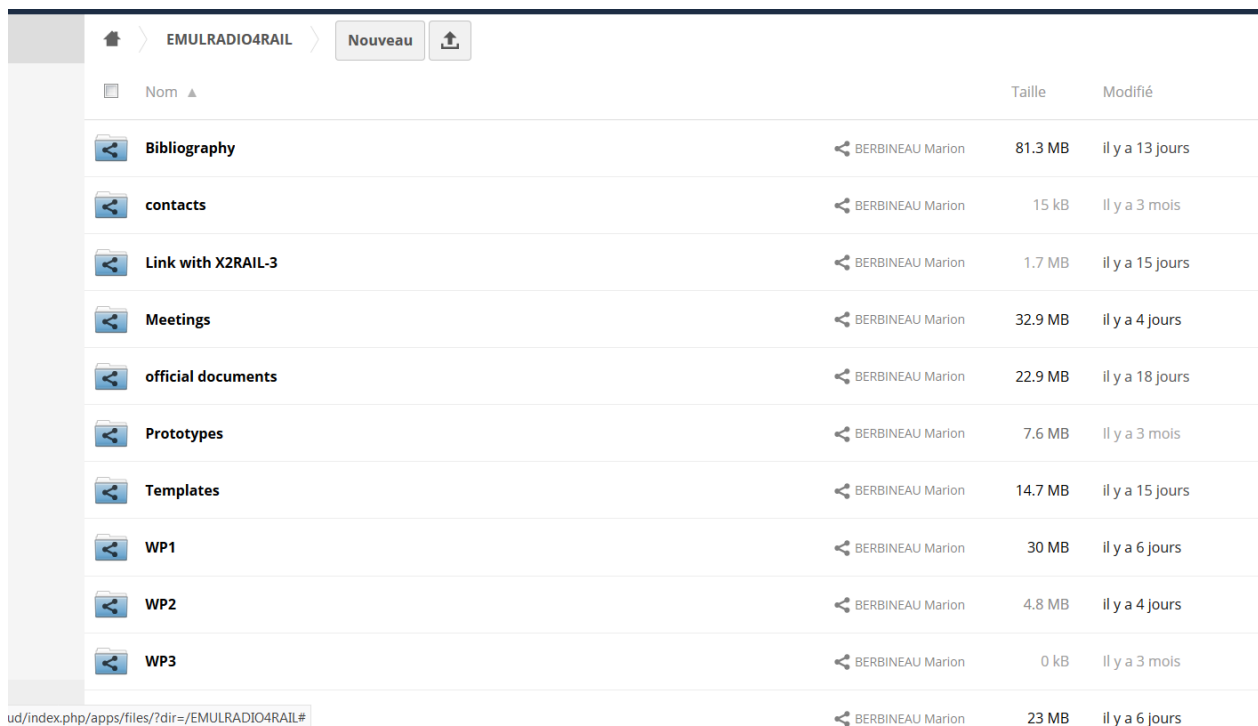
5.5. Document Repository

A document repository has been set up in order to facilitate the exchange of information. The tool selected is Owncloud.

The server is hosted by IFSTTAR. All documents are available on a shared interface, Owncloud, which is password protected. New participants can be granted access upon request by contacting the project coordinator, Marion Berbineau (IFSTTAR).

The repository can be accessed with every web browser. The connection URL is: <https://owncloud.ifsttar.fr/owncloud/>

Participants can upload and download document freely. The interface is designed as showed below:



Nom	Taille	Modifié
Bibliography	81.3 MB	il y a 13 jours
contacts	15 kB	il y a 3 mois
Link with X2RAIL-3	1.7 MB	il y a 15 jours
Meetings	32.9 MB	il y a 4 jours
official documents	22.9 MB	il y a 18 jours
Prototypes	7.6 MB	il y a 3 mois
Templates	14.7 MB	il y a 15 jours
WP1	30 MB	il y a 6 jours
WP2	4.8 MB	il y a 4 jours
WP3	0 kB	il y a 3 mois

Image 1 repository for the project.

5.6. Document Numbering and Naming Convention

The deliverables are classified according to the following types:

- P: Prototype
- R: Report
- D: Demonstrator
- O: Other

With respect to the confidentiality of deliverables and other documents, including presentations, the following four levels of security are considered:

- PU: Public Usage. No restrictions on access (in secured PDF format).
- PP: Programme Participants. Restricted to the IST participants and the JU.
- RE: Restricted to an expressly defined group, defined by the Consortium, and the Shift2rail JU.
- CO: Confidential Only. Only for Consortium members and the JU.

In order to facilitate the common browsing and storage in different platforms and OS's, no spaces nor dots or special characters will be used in the document names, and instead, the underscore character "_" will be used.

All these documents will be named and numbered according to the following rules, in order to facilitate the quick identification and indexing:

All the documents names starts with the word "EmulRadio4Rail", in order to facilitate the identification with other projects documents, and to raise the awareness or the project within a number of people that will download the documents from the public website.

Versions 0_X will indicate that the document is still a draft not approved by the internal reviewers. The official document to be sent to the Shift2rail JU will be numbered as v1_0. Further revisions or new issues of a deliverable will make use of the following format: v1_X, vY_X.

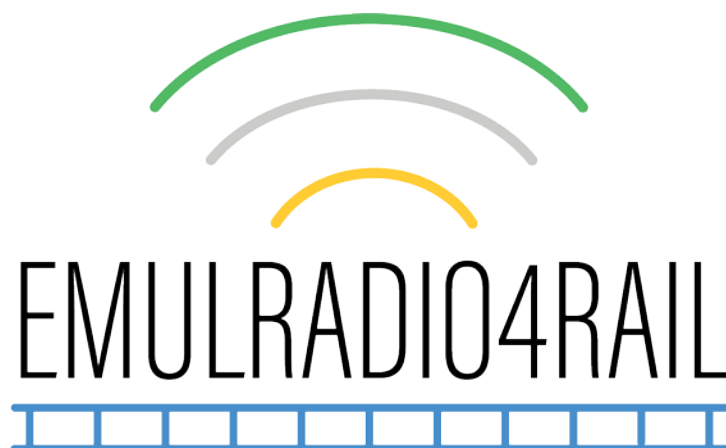
For example, deliverable D5.1 project quality plan, being IKERLAN the responsible organization, security level confidential, would be named in the following way:

EmulRadio4Rail_D5.1_IK4L_CO_v1.0.pdf

In order to facilitate the work and localization of the documents, all the documents will be posted in the repository as soon as possible.

5.7. Emulradio4Rail's logo and templates

Two logo types are available, as well as a version "white text" to accommodate all types of support:





It is advised that the EmulRadio4Rail logo appears in all EmulRadio4Rail related documents. Any material co-funded with the project budget needs to make explicit reference to it and if possible make use of the EmulRadio4Rail logo.

The logos are available in PNG format.

The Acronym of the project – i.e., EmulRadio4Rail– is the main representative mark. When possible it has to be used with the above mentioned logos, respecting the font and colours.

5.8. Templates available on the repository:

Partners have access on Owncloud to the following templates, to be used for the project:

- Minutes of meeting template
- Presentation template
- Poster template (two versions are available)
- Deliverable template
- Technical report template

6. Reporting procedures

6.1. Deliverable, documents

Any deliverable or document (in the following only called “deliverable”), including presentations, must follow the rules herein specified.

Deliverables will normally fall within the work to be done in the work packages, and as such, a work package leader or activity leader will be assigned the production and editing of a particular deliverable.

The final draft of the deliverable should be available in the repository two weeks in advance of due date.

The ultimate responsibility for the quality of deliverables resides with the peer review team that must check the quality of all deliverables before the final submission to the JU.

IFSTTAR, as Project Coordinator, will review the progress reports containing resource reporting information, as the last stage before submission to the JU.

The WP leader will announce the availability of the deliverable to the peer reviewers, who will review it and give comments within one week using on-line comments with track changes. The partners responsible for the deliverable will modify it accordingly. If the deliverable was not approved by the peer reviewers, the review process has to be repeated after modification within 5 working days.

Whether the deliverable responsible partner fails to provide the deliverable, or the deliverable does not fulfil the objectives even after corrections, the project consortium will take the required actions accordingly to the provisions of the Consortium Agreement and Contract.

At least 3 working days before the delivery date, the work package leader will upload the final version of the deliverable (as PDF, if applicable) to the repository respecting the naming requirements and notify the Project Coordinator of its availability. The deliverable shall contain all the logos and it will be formatted according to this handbook recommendations.

The Project Coordinator will submit the deliverable to the project officer. Once the deliverable is approved by the EC, in the case of a public deliverable, it will be made available in the public web site.

The deliverables will be submitted electronically to the Project Officer, and simultaneously, the hard copies – if requested – will be sent by certified mail, accordingly to the provisions of the contract.

At least the Project Coordinator will keep an additional copy for backup and security

reasons.

A template for Word and PowerPoint documents is available at the project repository.

6.2. Presentations, posters and graphical material

Any presentations of contents obtained from the project may make use of the corporative presentation template available at the repository.

In addition to the available templates, the consortium will prepare a number of alternative materials to help disseminating and presenting the project results in a coherent and effective way:

- A general presentation to provide a quick look to the project objectives and contents. This set of slides will be updated periodically with the new results as the project advances.
- Poster templates are available in A0 format to present the project at conferences and poster sessions.

6.3. Meeting minutes and agenda

The reporting of meetings is mandatory to guarantee that the decisions taken are known and accepted by all the people working in the project.

The coordinator will propose an agenda for each meeting at least 14 calendar days in advance of the agreed date. The Project Coordinator will be responsible of producing the minutes following the template available at the project repository in no more than 10 calendar days. The minutes shall be considered as accepted if, within 15 calendar days from sending, no Member has objected in writing to the Project Coordinator with respect to the accuracy of the draft of the minutes.

6.4. Periodic report

In order to provide timely project reporting to Shift2rail JU, efficient and accurate financial data, the yearly cost statements will be aggregated by each partner in the Project Periodic Report (PPR).

This Project Periodic Report will include:

- The declaration by the scientific representative of the Project Coordinator.
- A publishable summary.
- A list of project objectives tackled in the reporting period and the work progress and achievements during the period.
- A management report.
- The explanation on the use of resources and financial statements.
- The Form C Financial statement, provided by each contractor.

IFSTTAR, as Project Coordinator will check the data of the PPR. If any difference arises, the partner should correct them within two weeks from notification.

IFSTTAR will upload on the Participant Portal the report.

The PPR will follow the template provided by the JU and IFSTTAR. Partners will follow the instruction of IFSTTAR regarding timeline so as to avoid any delay in the process.

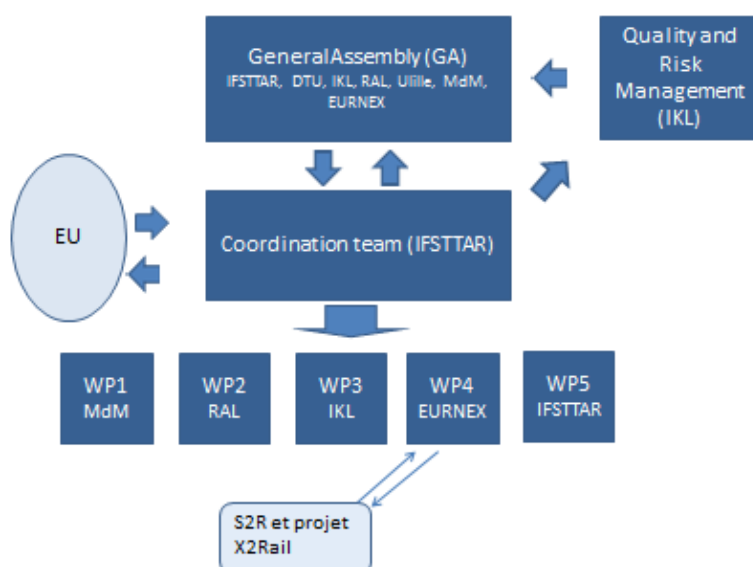
7. Quality management

The main goal of project management is to provide a focused, lean but effective framework to support the partnership in achieving the scientific and technical objectives of the project. Efficient decision-making processes and swift responsiveness to changing circumstances are required. This is what the theory says, but it is not so easy to achieve since experience shows that outstanding – and very often too complex – quality management plans fail simply because they are very difficult to apply in practice.

The goal has been to define a management structure and a set of principles and procedures which, whilst being as flexible, agile and cost-efficient as possible, leave as little room as possible to subjective interpretation.

7.1. Management structure and quality

The work to be done within EmulRadio4Rail is structured into a set of work packages (WPs) and each work package is divided into tasks. Quality is insured by the Quality and risk Manager (IKL), but other actors in the consortium are involved in the quality process.



The **Project Coordinator** takes responsibility for the overall project management. This includes interactions with the European Commission on contract-related issues as well as chairing regular management meetings. The PC has amongst his responsibilities a set of administrative and financial tasks – representing the project in the contract negotiation, and in relation to the EC's Project Officer, representing the consortium in workshops and



official meetings, collecting administrative reports from partners and forwarding periodical reports to the Project Officer, preparing and updating the consortium agreement between the participants, administering project resources and project spending, managing the overall ethical and gender issues, coordinating the exploitation of the project's results, *etc.*

The Quality and Risk Manager, from IKL, is also tasks leader 5.3; he will help the PC in ensuring that the required quality of the project is achieved. Specifically, the QRM will be in charge of the design and implementation of the Quality Plan detailing the rules and policies to follow in order to maintain the highest possible quality. The QRM will be in charge of the continuous follow-up of work, proposing suitable corrections in case of non-conformity. Quality control will include revising and pre-approving deliverables and project management. Taking into account the risks table identified in the Grant Agreement, the PM will give feedback to partners at least at the occasion of each General Assembly on any change in the risk level, and clear possible mitigation solutions. Should the risk situation evolve rapidly, the PM will call an emergency meeting of the GA by electronic means in order to deal with the issue.

7.1.1. Workpackages (WPs) Leaders

The WPs leaders are responsible for the coordination of the activities carried out by their WP, and in charge of the corresponding reports and deliverables. They coordinate the work of the task leaders responsible for the supervision of the particular tasks comprised in their WP. The task leaders within each WP report to their WP leader. The WP Leaders report to the PM. They are all members of the GA.

The WP leaders are expected to collaborate and exchange views with other WPs for improved coordination across the project activities. To save resources, the mandatory technical meetings will take place at the same time as the GA meetings. Additional technical meetings may be organized whenever necessary.

7.1.2. Decision process and conflict resolution

Project management aims at always achieving consensus regarding to consortium contractual issues. If not possible, decisions will be made by a vote of the General Assembly. The GA comprises at least one representative from each partner, with voting weighed according to the resources committed by the partners (as explained in the Consortium Agreement). A majority verdict will be sufficient to carry the decision. In case of a tie, the Project Manager will have a casting vote.

The Consortium Agreement to be signed before the beginning of the project will provide more details regarding the decision making process and conflict resolution. In the unwished case of outstanding disputes, final settlement will be managed through arbitration in Brussels under the rules of arbitration of the International Chamber of Commerce by an arbitration panel appointed under those rules. The outcome of the arbitration will be final and binding upon the partners concerned.

If the dispute concerns Intellectual Property, the PM can request the assistance of the European Commission IPR helpdesk. Such decisions are final and accepted by all partners.

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7.3. Internal Reviewing Procedure

The project will apply an internal reviewing procedure to guarantee the quality of its results. Each WP leader will be responsible for the quality of the results – especially deliverables - of their WP, which will be subject to a peer review by experts, selected on the following arguments:

- The reviewer should not have significantly contribute to the deliverable under review
- The reviewer should have an interest in making us of the deliverable outcomes.

Reviewers shall use the comment function of Word or Acrobat to request changes that refer to a concrete text position. If the document to be reviewed is in Word it contains a “Peer Review” section at the beginning which is to be filled out by the reviewer. General comments and change requests can be added there. In other cases, the reviewer creates a separated peer review document containing only the document metadata and peer review pages.

The peer review report is the main tools in EmulRadio4Rail to monitor the progress and quality of the project.

The list of peer reviewers has already been drafted, as well as the timing of each review in order to be sure to have a fast and timely process. The list is included below.

Last but not least, Risk Management, described in next section, is also a critical factor for the management processes – i.e. a low quality in a deliverable needs to be identified as a risk, involving a mitigation plan to be prepared and executed.

7.4. List of peer reviewers for the Deliverables

N°	Title	WP	Leader	Type	DL	Due date	Reviewer
D5.1	Quality Plan	5	IKL	Report	Pu	1 (end of December)	Juliette Renaud (IFS)
D1.1	Application layer requirements for communications systems in railway environments (stream a)	1	MdM	Report	Pu	3 (enf of February 19)	José Soler (DTU)
D2.1	Solutions to emulate the Radio Bearer (stream b)	2	IKL	Report	Co	4 (end of March)	Juan Moreno (MdM)
D4.1	Data Management Plan	4	IFS	Report	Pu	4 (end of March)	Kristina Svensson (Eurnex)
D3.1	High-level design of Radio access emulation tool (stream d)	3	IKL	Report	Pu	5 (end of April)	Christophe Gransart (IFS)
D4.2	Dissemination plan	4	Eurnex	Report	Pu	6 (end of May)	Marion Berbineau (IFS)
D3.2	Experimental assessment of the communications based on the Radio access emulation tool	3	RDL	Report	Pu	9 (end of August)	Ying Yang (DTU)
D1.2	Present and future railway communications scenarios: description of perturbations with impact on railway communications (stream c)	1	ULille	Report	Pu	12 (end of November)	Marion Berbineau (IFS)
D1.3	Characterization of the railway environment:	1	MdM	Report	Pu	12	Laurent Clavier

	channel models & general characteristics					(end of November)	(Univ Lille)
D3.3	Design and implementation of Radio access emulation tool	3	IKL	Demo	Pu	12 (end of November)	Christophe Gransart (IFS)
D4.3	Exploitation plan	4	IFS	Report	Co	14 (end of January 20)	Aitor Arriola (IKL)
D2.2	IP impairments models	2	RDL	Report	Pu	14	José Soler or Ying Yang (DTU)
D3.4	Operation manual of Radio access emulation tool (stream f)	3	IKL	Report	Pu	15	Alessandro Vizzari (RDL)
D3.5	Final recommendations for integration	3	IFS	Report	Co	18	Raul Torrego (IKL)
D4.4	Report on dissemination activities	4	Eurnex	Report	Pu	18	Marion Berbineau (IFS)

8. Risk management

The Quality and Risk manager, along with the Coordinator, will monitor the risks already identified at the beginning of the project (see table below). He will update the table and propose solution that the coordinator will propose to the Consortium. He is also responsible for the Risk Management Report which is part of the Periodic report to the JU.

The Quality and Risk manager, from IKERLAN (IKL), is also tasks leader 5.3; he will help the Project Manager in ensuring that the required quality of the project is achieved. Specifically, the QRM will be in charge of the design and implementation of the Quality Assurance Plan detailing the rules and policies to follow in order to maintain the highest possible quality. The QRM will be in charge of the continuous follow-up of work, proposing suitable corrections in case of non-conformity. Quality control will include revising and pre-approving deliverables and project management. Taking into account the risks table identified in the Grant Agreement, the PM will give feedback to partners at least at the occasion of each General Assembly on any change in the risk level, and clear possible mitigation solutions. Should the risk situation evolve rapidly, the PM will call an emergency meeting of the GA by electronic means in order to deal with the issue.

Significant risks and associated mitigation measures

To ensure the achievement of the objectives of the EMULRADIO4RAIL project, it is essential to identify and understand the significant project risks already in advance. Therefore, taking into account project-environmental factors, the setup of the risk management process needs to be aligned with the project objectives defined in Section 1.2 of the DoA document. The table 15 presents the risks identified by the partners with regards to the targeted technological innovation and project work and indicates the likelihood of occurrence. The WPs involved indicate the scope of the risks, while the proposed mitigation measures target to reduce the likelihood of occurrence.

Description of risk (indicate level of likelihood: Low/Medium/High)	WP(s) involved	Proposed risk-mitigation measures
Poor communication with the Partners from the Railway Sector (PRS) likelihood: low, impact: high	All WP	The project coordinator will play a key role in strengthening and keeping the contact with the PRS. Regular meetings with progress update should incentive a join work.
Problem of interfacing Open Air interface network emulator with radio channel emulator Likelihood : low, impact: medium	WP3	We will deploy standard interface protocol and data format, e.g. Ethernet; Close collaborations between partners
Problem of communicating network simulator (RIVERBED Modeler) with radio channel emulator Likelihood : low, impact: medium	WP3	We will use standard interfaces; We will implement middleware program to interpret messages. Close collaborations between partners
Communication prototype	WP3	We will use of the shelf equipment for the

availability from S2R members Likelihood : low, impact: medium		RAT as well as R&S equipment.
Problems of integration of the different bricks of the tools provided by different partners Likelihood : medium, impact: high	WP3	We will consider standard interfaces Close collaborations between partners will be established along the project with synchronization meeting Verification all along the developments
Deviation in budget consumption Likelihood : low, impact : medium	All WPs	Expenses will be periodically monitored (mid-period reports). In case of deviation, transfer of resources between partners will be discussed by the GA upon proposal of the PC
IPR conflict between partners, especially regarding the exploitation plan Likelihood: low, impact: medium	WP4	The CA should prevent the main issues. IPR issues will be discussed at the occasion of each GA meetings by the task leader in charge of exploitation plan, as the co-proprietary agreement will be an ongoing project for most of the duration.
Over 2 months delay in deliverables completion Synchronization issues between WPs Likelihood: low, impact: high	WP5	Frequent meetings will help preventing such difficulties. The Quality Manager will report on deliverable issues at each consortium meeting to anticipate deviations
Uncoordinated dissemination activities emerge during EMULRADIO4RAIL life Likelihood: low, impact: medium	WP4	The partners will be urged to correlate their activities upon detection of any uncorrelated activities. Eurnex has good experience gained from former projects that will be applied to foster common dissemination activities and to funnel any dispersed actions together again.
A partner is leaving the project Likelihood: low, impact: medium	WP5	The PC will propose a replacement to the GA. The reasonable size of the consortium should help swift decision making.
Conflict between partners Likelihood: low, impact: medium	All WPs	Clear guidelines for decision making defined in Grant Agreement for swift decision in case of conflict under guidance of PC.

During the project lifetime, risks will be continuously monitored, new risks identified and analysed. Regular conference calls and meetings will ensure the timely identification of deviations and irregularities. Interim reports on risk management will further encourage periodic risk debates to ensure the early identification and fast reaction. The relevance of risk management is underpinned by the inclusion in WP5.