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DELIVERABLE D 8.1

Plan for Exploitation and Dissemination of project Results (PDER)

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Executive Summary

The aim of this document is to provide a dissemination and exploitation strategy for the GEARBODIES (Innovative Technologies for Inspecting Carbodies and for Development of Running Gear) project and to describe the tools that will be used to facilitate the widespread of information and knowledge from the results created by the project, among and beyond the members of the consortium (and beyond the life of the project). For the dissemination of GEARBODIES to be successful, there needs to be a good cooperation between all the Work Packages throughout the life of the project.

In this respect, an overview of the dissemination and exploitation activities to be undertaken during the project's life is going to be provided, followed by a separate and more detailed analysis of each activity.

Dissemination and exploitation of results is not only crucial to the acceptance and implementation of technologies developed by suppliers and end-users, but more importantly by the Shift2Rail Joint Undertaking, which will carry on the research into a wider scope.

This deliverable will be a dynamic document that will be revisited and edited periodically whenever necessary and will therefore evolve with the project.

List of abbreviations, acronyms and definitions

Abbreviation / Acronym	Definition
CEN	European Committee for Standardisation
CENELEC	European Committee for Electrotechnical Standardisation
CFM	Call For Members
ERA	European Union Agency for Railways
EU	European Union
GA	Grant Agreement
H2020	Horizon 2020 framework programme
IP	Innovation Programme
LCC	Life Cycle Cost
S2R JU	Shift2Rail Joint Undertaking
TD	Technology Demonstrator
WS	Work Stream



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1 Introduction

This document has been drafted in order to provide a clear dissemination and exploitation plan for the GEARBODIES project. To facilitate this, we present materials and strategies for communicating and disseminating GEARBODIES to railway stakeholders, the scientific community and the general public. Those include: the creation of a project identity; the creation of a public website; the production of two newsletters; the creation of a project brochure; the organisation of a final conference; participation to conferences and the publication of results in relevant journals. Moreover, the dissemination and exploitation plan describes how GEARBODIES will interact with other Shift2Rail (S2R) projects.

Throughout the project, the Impact boosting activities and LCC assessment Work Package (WP8) will drive the dissemination of information, particularly for the purpose of ensuring future exploitation and the collaboration with the other S2R projects. The widespread and targeted dissemination of the project's outputs is vital to the acceptance and implementation of the technologies developed and for this reason all the other project partners are going to be involved in the production and publication of material like scientific publications, articles, press releases, newsletters and project brochure.

2 Background

The GEARBODIES project will work towards the development of cost-efficient and reliable trains (including high capacity and high-speed trains) by contributing with specific innovations identified by the call to Technology Demonstrators (TD) of Innovation Programme 1 (IP1) within Shift2Rail, through two dedicated work streams:

- Work Stream 1 (WS1): Inspection methods for carbodies using new materials (TD1.3);
- Work Stream 2 (WS2): Innovative approaches for developing running gear components (TD1.4).

The aim of the proposed GEARBODIES project is to develop new inspection methods and technology for the inspection of new materials in carbody applications, and to employ innovative approaches for developing novel concepts with enhanced lifetime for key running gear components.

Therefore, the scope of GEARBODIES is twofold. Firstly, it aims to develop effective and affordable solutions for inspecting carbodies that are using new lightweight materials. Secondly, it aims to employ innovative approaches, tools and methods for developing novel concept designs of silent, track-friendly, reliable, and low LCC running gear components.

In addition, the GEARBODIES consortium will liaise and work together with Shift2Rail members to allow for correlating and/or implementing their innovations into the final TD1.3 and TD1.4, contributing thus to the Shift2Rail IP1 strategy.

The two Work Streams of GEARBODIES will actively contribute to improving the efficiency, safety and competitiveness of the European railway sector by contributing to the implementation and exploitation of innovative materials and practices, with profound impacts on the cost-efficiency and reliability of the sector, as well as on its energy consumption and infrastructure maintenance. Inspection time will be significantly reduced, while the use of new materials and systems will enable increasing the lifetime of the components and lowering maintenance costs.

3 Definitions

Throughout this document, the terms 'communication', 'dissemination' and 'exploitation' will be used frequently. The definitions used by the authors are shown below:

- **Communication:** The aim of taking strategic and targeted measures for promoting the action itself and its results to a multitude of audiences, including the media and the public, and possibly engaging in a two-way exchange. The aim is to reach out to society as a whole and in particular to some specific audiences while demonstrating how EU funding contributes to tackling societal challenges.
- **Dissemination:** The aim of dissemination is to spread the outputs of the project among interested parties. This activity involves presentation of the project's results to the European railway community and the industrial and scientific community, while managing knowledge within the consortium. The means to achieve this are described in this document
- **Exploitation:** The aim of exploitation is to favour the market uptake through the use of the results of the project, particularly by using them in further research activities (outside the action). This activity involves the use of the project's results and developed technologies by the suppliers and end users. It involves working closely with all work packages to ensure outputs are captured and partners are able to engage with potential customers and also that they are supported in the development of the project outputs in order to produce products and services that can be exploited.

Dissemination and exploitation of results are crucial to the acceptance and implementation of technologies developed in the project by suppliers and end-users.

4 Target Groups

The consortium plans to disseminate the results at different levels, with the main target audience listed below:

- Railway Undertakings, Infrastructure Managers and train operators;
- Industrial Transport Associations;
- Associations, regulatory and standardisation bodies;
- National, European and international authorities;
- Scientific Communities, European Technology Platforms;
- Shift2Rail and its successor Europe's Rail Joint Undertakings;
- Past and ongoing projects.

5 Dissemination Plan

5.1 Objectives

Dissemination will mainly focus on communication activities during the project implementation aiming at informing the relevant stakeholders about the main activities and results achieved during the 25 months of GEARBODIES.

External communication and dissemination will be achieved by creating a project identity and a public website, attending to conferences and relevant events and publishing articles in relevant journals.

As outlined in the GEARBODIES description of work, the dissemination objectives are to:

- Establish a dissemination platform to facilitate wide-spread information transfer amongst and beyond the members of the consortium (and beyond the life of the project);
- Set up communication channels with GEARBODIES and other S2R projects to ensure a permanent link/communication with the relevant S2R activities;
- Ensure that the project outputs reach targeted stakeholders;
- Ensure that appropriate dissemination strategies are applied.

5.2 Dissemination measures

5.2.1 Project Identity

A project identity has been created at the beginning of the project including templates for presentations and reports, a project brochure as well as the GEARBODIES logo. The project identity will help dissemination activities and ensure a consistent communication of the project concept, objectives and results. For instance, the brochure will be distributed at project workshops and conferences, where project partners will participate.



Figure 1: Sample of GEARBODIES templates.

5.2.2 Public website

A dedicated website has been set up at the beginning of the project. The website (<http://www.gearbodies.eu/>) is publicly accessible, with a section where visitors can register their interest.

The website is open to the public and displays the key project information, partners, results, news/events and links to the partners' websites. All the public deliverables will be published on the website and will be available for download.

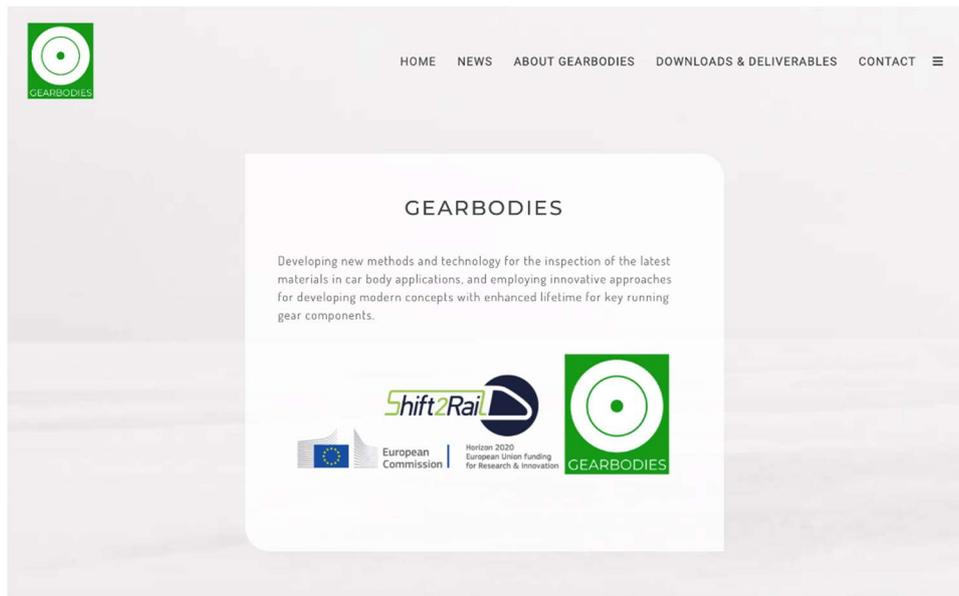


Figure 2: Homepage of GEARBODIES public website.

5.2.3 Newsletters

The project will produce two newsletters. The first newsletter will be released in month 13 and the second newsletter towards the end of the project in month 25 (target dates). The newsletters will provide up-to-date information on the status and achievements of the project. The newsletters will be circulated via e-mailing lists and in printed version where relevant.

In order to ensure that the widest audience possible is reached, each partner will promote the content to their respective networks of contacts. The newsletter will also be uploaded on the project website and printed copies will be distributed at events and workshops where relevant.

5.2.4 Brochure

During the first months of the project, a brochure has been created. The main objective of this publication is to provide the wide audience with some preliminary information on the goals of the project, the structure and main planned activities and the members of the GEARBODIES consortium. The brochure anticipates the newsletters and has a more generic content, as the activities of the project were still at an early stage at the time it was produced. The project brochure will be distributed during public events.

GEARBODIES
Innovative Technologies for Inspecting Carbodies and for Development of Running Gear

Project Concept

The GEARBODIES project will work towards the development of cost-efficient and reliable trains by contributing with specific innovations identified by the call to Technology Demonstrators (TD) of Innovative Programme 1 (IP1) within Shift2Rail, through two dedicated work streams:

- Work Stream 1 (WS1) Inspection methods for carbodies using new materials (TD1.3) which aims to develop effective and affordable solutions for inspecting carbodies that are using new lightweight materials;
- Work Stream 2 (WS2) Innovative approaches for developing running gear components (TD1.4) which aims to employ innovative approaches, tools and methods for developing novel concept designs of running gear components with extended lifetime, and low LCC, whilst maintaining or reducing current levels of reliability, noise emissions, and track damage.

In addition, the GEARBODIES consortium will also work together with Shift2Rail members to allow for correlating and/or implementing their innovations into the final technological demonstrators (TDs) namely: TD1.3 "Carbody Shell Demonstrator" for WS1 and TD1.4 "Running Gear Demonstrator" for WS2, contributing thus to the overall Shift2Rail IP1 strategy.

The two Work Streams of GEARBODIES will actively contribute to improving the efficiency, safety and competitiveness of the European railway sector by supporting the implementation and exploitation of innovative materials and practices, with profound impacts on the cost-efficiency and reliability of the sector, as well as on its energy consumption and infrastructure maintenance. Inspection time will be significantly reduced, while the use of new materials and systems will enable an increase in the lifetime of components and lower maintenance costs.

The common element of WS1 and WS2 is the contribution towards the improvement of rolling stock maintenance processes through 1) the use of better inspection techniques (WS1) and 2) development of running gear components with enhanced performance (WS2).

FIGURE 1
Overview of GEARBODIES concept

FACTS AND FIGURES

- Budget: 2.4M
- Duration: 25 Months
- 13 Partners from 8 EU countries
- Starting Date: 01.12.2020
- Grant Agreement No. 101013296
- Coordinator: Eurnex
- Contact Us: CELESTINO SÁNCHEZ, Project Coordinator, cesama@eurnex.eu
- Website: www.gearbodies.eu

GEARBODIES consortium

Partners: aimen, AKIA, EURNEX, Newcastle University, RWTH AACHEN UNIVERSITY, SAF SACATEC, SAPIENZA, SCHAEFFLER, unife, UNIVERSITY OF LEEDS, VELNUS TECH

Figure 3: Extract from the GEARBODIES brochure.

5.3 Dissemination events & participation in conferences

The GEARBODIES consortium will organise one main public event at the end of the project, the Final Conference, whose aim will be to present all the results of the project. This conference will be open to anyone interested in participating. To ensure maximum impact, invitations will be sent to the key actors in the field. The location will be chosen to facilitate participation and it will also take into consideration possible Covid-19 pandemic restrictions at the time of the events.

The final conference will provide a platform to discuss the achieved results of the project. Solutions for the identified problems and challenges will be presented based on the GEARBODIES project results and the harmonisation of needs, requirements and demands facing Shift2rail's first Innovation Programme (IP1) expectations will be discussed.

Apart from the final conference, some other conferences and public events will be targeted where GEARBODIES can be presented and communicated to a wide audience. GEARBODIES will be presented during high-level European and International events such as:

- S2R Innovations Days (9-10 December 2021, Brussels & online);
- World Congress on Railway Research (WCRR 2022 6-10 June 2022 in Birmingham);
- InnoTrans 2022 (20-23 September 2022 in Berlin);
- Transport Research Arena (TRA2022, 14-17 November 2022 in Lisbon).

The project partners will be active in the promotion and dissemination, by joining these and other major events and conferences and presenting results and achievements of the project.

5.4 Social Networks

Social networks are very efficient to target a large audience or more specific communities. At this stage, the network Twitter has been chosen, but when relevant, other networks such as LinkedIn will also be used:

Twitter is one of the channels chosen for disseminating information about the project to a wide audience. The objective is to use the project partners' existing Twitter accounts in order to leverage their already established audience when "tweeting" pieces of news such as news articles, information about GEARBODIES events, relevant conferences, major findings, etc.

One of the key advantages of using Twitter is that it enables the dissemination of short pieces of information which will contribute to driving back the traffic towards the project's website. Another benefit is the multimedia support offered by Twitter, which allows partners to post short videos, text and pictures.

The partners will use at least the specific hashtag created for the project: #GEARBODIES in order to maximise the impact of the outreach.



GEARBODIES informs and works together with the Shift2Rail communications team to ensure that the social media posts from GEARBODIES get the widest spread with retweets etc from Shift2Rail.

5.5 Publications & Papers/journals

Regular information shall be published through the usual channels of the different associations involved in the project. Project results are also planned to be published through articles mainly in specialised press and scientific journals such as:

- Railway Gazette;
- International Railway Journal;
- RTR European Rail Technology Review;
- European Railway Review;
- Rail Technology Magazine;
- Eisenbahn Ingenieur.

Furthermore, different external scientific media shall also be considered.

6 Exploitation Plan

6.1 Objectives

GEARBODIES is setting the foundations for developments that will be continued within Shift2Rail. Therefore, the exploitation of the project's results will have to be ensured towards S2R, and IP1 in particular.

The objectives for the exploitation of results are the following:

- To ensure a good transfer of results between GEARBODIES and Shift2Rail.
- To ensure that GEARBODIES results will be forwarded through the dedicated initiatives in Shift2Rail to the relevant regulation and standardisation bodies competent for the various transport sectors if needed.

For the abovementioned reasons, GEARBODIES is fully committed to finalising and signing the Collaboration Agreement with the complementary CFM project of IP1, PIVOT2.

6.2 Exploitation measures

To ensure the good transfer of results between GEARBODIES and Shift2Rail, the GEARBODIES project will take the following steps:

- Develop and sign a Collaboration Agreement with PIVOT2, which at the time of writing is currently at the final stages, along with any other relevant future Shift2Rail IP1 CFM project if needed;
- Ensure a smooth transfer of GEARBODIES results to the complementary CFM project PIVOT2, as well as with any other relevant future Shift2Rail IP1 CFM project, through the organisation of technical workshops on specific subjects identified, whenever needed. These direct technical interactions could be organised at WP level, to facilitate the knowledge transfer for the purpose of the Shift2Rail activities. These will be managed on a case-by-case basis;
- Regular interaction with the S2R JU, through the IP1 Steering Committees, where possible issues can be resolved between all the project coordinators.

All this exchange of information will enable the GEARBODIES project to provide feedback to the relevant people in Shift2Rail, but also to collect suggestions that could be relevant for the ongoing activities of the project.

The dissemination and exploitation measures of the project will address the full range of potential users and uses. This includes Associations/Federations/Regulatory Bodies (initially: ERA and CEN/CENELEC), Railway Undertakings, Freight Operators and Infrastructure Managers, Research centres, actors in the railway supply industry, Regional/National and European Institutions. The project will capitalise upon established contacts of the members, and those of all GEARBODIES partners, networks and ways of working when trying to reach the most appropriate stakeholders to inform



them on the project activities, as described in the table below.

6.3 Identification of the Project's exploitable results

The 13 exploitable results that will be developed within the GEARBODIES are presented in a summarised format in the following table:

#	Exploitable Product(s)/Measures(s)	WS	WP	Owner(s)
1	Thermographic and Ultrasonic data processing, including de-noising, feature extraction and selection, classification modules for detecting, locating and characterising defects in composite samples.	1	2	CERTH, AKKA, DASEL
2	Thermography inspection methodology and prototyping system including all software and hardware components, as well as peripherals for platform integration.	1	3	CERTH, AKKA, DASEL
3	Design and development of the ultrasonic inspection methodology and prototyping system including all software and hardware components, as well as peripherals for platform integration	1	3	AKKA
4	Integrated prototype embedding two NDT inspection methods (thermography and ultrasonic) for various thicknesses and types of composites. Application to rail but also possible in automotive, aerospace, etc.	1	3	CERTH, AKKA
5	Development of a methodology for assessment of running gear elements with potential enhanced lifetime based on Analytic Hierarchy Process (AHP)	2	4	VG TU
6	Development of a vehicle dynamic models for the simulation of the vehicle behaviour (ex-ante and post-ante)	2	4	DICEA*, RWTH*, VG TU
7	Development of a methodology for the assessment of running gear LCC	2	4	LEEDS*
8	Development of a new elastomer with extended lifetime and reduced LCC	2.1	5	AIMEN, VG TU, SAC*
9	Methodology and guidelines for processing high-performance elastomer-metal interfaces with improved resistance and durability	2.1	5	SAC*
10	Design and prototype of selected relevant elastomer-based running gear components	2.1	5	VG TU, SAC*
11	Experience on, and knowledge of the feasibility and methodology (including processing guidelines) for potential use of HEA as an alternative solution to traditional steel grades in journal bearings. This would enable further research to develop feasible and cost-efficient manufacturing processes.	2.2	6	UNEW*
12	Experience on, and knowledge of the feasibility of use of novel polymer materials for new bearing cage concepts, in combination with different lubricants; also, potential development of novel cage design concept (this would require further research to higher TRL).	2.2	6	SCHA
13	Design and prototype of a journal bearing with non-line contact rollers	2.2	6	SCHA
(*) Provisional information, subject to further discussion at the Exploitation Board.				

Table 1: Identification of the Project's exploitable results.

6.4 Exploitation claims

In terms of background and foreground, the table below provides an overview of the claims made by all partners for each of the results. Individual tables providing details on the background and foreground of each partner are available in Annexes 1 to 13. Please note that partner 1 (EUR) and partner 11 (UNIFE) do not have any claims.

#	Exploitable Product(s)/Measures(s)	EUR	SCHA	AIMEN	CERTH	DICEA	RWTH	LEEDS	AKKA	UNEW	VG TU	UNIFE	DASEL	SAC
1	Thermographic and Ultrasonic data processing, including de-noising, feature extraction and selection, classification modules for detecting, locating and characterising defects in composite samples.				X				X				X	
2	Thermography inspection methodology and prototyping system including all software and hardware components, as well as peripherals for platform integration.				X				X				X	
3	Design and development of the ultrasonic inspection methodology and prototyping system including all software and hardware components, as well as peripherals for platform integration								X					
4	Integrated prototype embedding two NDT inspection methods (thermography and ultrasonic) for various thicknesses and types of composites. Application to rail but also possible in automotive, aerospace, etc.				X				X					
5	Development of a methodology for assessment of running gear elements with potential enhanced lifetime based on Analytic Hierarchy Process (AHP)										X			
6	Development of a vehicle dynamic models for the simulation of the vehicle behaviour (ex-ante and post-ante)					(X)	(X)				X			
7	Development of a methodology for the assessment of running gear LCC							(X)						
8	Development of a new elastomer with extended lifetime and reduced LCC			X							X			(X)
9	Methodology and guidelines for processing high-performance elastomer-metal interfaces with improved resistance and durability			X										(X)
10	Design and prototype of selected relevant elastomer-based running gear components										X			(X)
11	Experience on, and knowledge of the feasibility and methodology (including processing guidelines) for potential use of HEA as an alternative solution to traditional steel									(X)				



#	Exploitable Product(s)/Measures(s)	EUR	SCHA	AIMEN	CERTH	DICEA	RWTH	LEEDS	AKKA	UNEW	VG TU	UNIFE	DASEL	SAC
	grades in journal bearings. This would enable further research to develop feasible and cost-efficient manufacturing processes.													
12	Experience on, and knowledge of the feasibility of use of novel polymer materials for new bearing cage concepts, in combination with different lubricants; also, potential development of novel cage design concept (this would require further research to higher TRL).		X											
13	Design and prototype of a journal bearing with non-line contact rollers.		X											
Claims marked with "(X)" indicate provisional information, to be further discussed at the Exploitation Board.														

Table 2: Partners' ownership claims with regards to Project results.

6.5 Rules for the exploitation of project results

The previous exploitation claims will be regularly monitored during the project implementation, at meetings of the project's Exploitation Board, the first one taking place in parallel to the second GEARBODIES Plenary Meeting, as well as meetings of the full consortium. During the project duration, background claims will be regulated through the Consortium Agreement. As for Exploitation claims, these will be governed by the Exploitation Agreement to be drafted in the final year of the project. Exploitation claims included in this deliverable (see Annexes) will be the basis for drafting the Exploitation Agreement.

For results owned by more than one partner (as co-owners or contributors), the concerned partners will have to agree on a joint exploitation strategy. Depending on this strategy, partners will have to prepare a separate agreement. The most common agreements derived from collaborative products are:

- Collaboration agreements, to follow-up research.
- Service agreements, for transfer or use of the knowledge developed during the project.
- Material Transfer Agreement (MTA) that regulate the future use of materials, procedures, software, protocols, etc.
- Non-disclosure agreement / Confidentiality agreement (NDA / CDA) to exchange confidential information for a defined purpose.
- Memorandum of Understanding / Letter of Intent (MoU / Lol) to set the conditions to be fulfilled before going any further.
- Licensing agreements, to agree on royalties for the use or exploitation of a particular result.

6.6 GEARBODIES Exploitation Board

The project's Exploitation Board, coordinated by EURNEX and with the participation from all the industrial partners, will be responsible for overseeing all exploitation activities. The first meeting is envisioned to take place alongside the second Plenary Meeting of GEARBODIES in June 2021. The main objective of this first meeting will be to review the existing exploitation plan and agree on the next steps. This board will be responsible for elaborating the Exploitation Agreement towards the end of the project. Also, this board will be responsible for gathering feedback and validating these exploitation strategies with the project's External Advisory Board (EAB). Further details on the EAB are available in D8.2, to be submitted on M25.



7 Conclusions

This document provides plans in the areas of dissemination and exploitation. It presents a comprehensive dissemination strategy for the GEARBODIES project and describes the materials and strategies that will be used for external communication, along with the engagement and uptake of the results by relevant stakeholders.

A series of dissemination events have been planned, and it is anticipated that more dissemination opportunities will arise as the project progresses. Therefore, the GEARBODIES consortium will use this plan as an initial strategy which will be further updated and reviewed on a regular basis. Dissemination activities will be discussed at TMC level and will be coordinated generally via WP8.

Routes to exploitation have been identified and the specific cooperation with the Shift2Rail Joint Undertaking and the relevant IP1 CFM project will be a key activity to ensure both success of GEARBODIES and Shift2Rail.



Annexes

Annex 1. EUR exploitation claims

No exploitation claims.

Annex 2. SCHA exploitation claims

#	Exploitable Product(s)/Measures(s)	Owner-ship claim	Background provided	Foreground developed	Exploitation claim
1	Thermographic and Ultrasonic data processing, including de-noising, feature extraction and selection, classification modules for detecting, locating and characterising defects in composite samples.				
2	Thermography inspection methodology and prototyping system including all software and hardware components, as well as peripherals for platform integration.				
3	Design and development of the ultrasonic inspection methodology and prototyping system including all software and hardware components, as well as peripherals for platform integration				
4	Integrated prototype embedding two NDT inspection methods (thermography and ultrasonic) for various thicknesses and types of composites. Application to rail but also possible in automotive, aerospace, etc.				
5	Development of a methodology for assessment of running gear elements with potential enhanced lifetime based on Analytic Hierarchy Process (AHP)				
6	Development of a vehicle dynamic models for the simulation of the vehicle behaviour (ex-ante and post-ante)				
7	Development of a methodology for the assessment of running gear LCC				
8	Development of a new elastomer with extended lifetime and reduced LCC				
9	Methodology and guidelines for processing high-performance elastomer-metal interfaces with improved resistance and durability				



#	Exploitable Product(s)/Measures(s)	Owner-ship claim	Background provided	Foreground developed	Exploitation claim
10	Design and prototype of selected relevant elastomer-based running gear components				
11	Experience on, and knowledge of the feasibility and methodology (including processing guidelines) for potential use of HEA as an alternative solution to traditional steel grades in journal bearings. This would enable further research to develop feasible and cost-efficient manufacturing processes.				
12	Experience on, and knowledge of the feasibility of use of novel polymer materials for new bearing cage concepts, in combination with different lubricants; also, potential development of novel cage design concept (this would require further research to higher TRL).	X	Preliminary concept of a journal bearing with non-line contact rollers.	Up to now, no further developments have been made on this topics.	Commercialisation.
13	Design and prototype of a journal bearing with non-line contact rollers	X	Preliminary concept of a journal bearing with non-line contact rollers.		

Table 3: SCHA exploitation claims.

Annex 3. AIMEN exploitation claims

#	Exploitable Product(s)/Measures(s)	Owner-ship claim	Background provided	Foreground developed	Exploitation claim
1	Thermographic and Ultrasonic data processing, including de-noising, feature extraction and selection, classification modules for detecting, locating and characterising defects in composite samples.				
2	Thermography inspection methodology and prototyping system including all software and hardware components, as well as peripherals for platform integration.				
3	Design and development of the ultrasonic inspection methodology and prototyping system including all software and hardware components, as well as peripherals for platform integration				
4	Integrated prototype embedding two NDT inspection methods (thermography and ultrasonic) for various thicknesses and types of				



#	Exploitable Product(s)/Measures(s)	Owner-ship claim	Background provided	Foreground developed	Exploitation claim
	composites. Application to rail but also possible in automotive, aerospace, etc.				
5	Development of a methodology for assessment of running gear elements with potential enhanced lifetime based on Analytic Hierarchy Process (AHP)				
6	Development of a vehicle dynamic models for the simulation of the vehicle behaviour (ex-ante and post-ante)				
7	Development of a methodology for the assessment of running gear LCC				
8	Development of a new elastomer with extended lifetime and reduced LCC	X	AIMEN has large experience on developing and manufacturing thermoplastic polymers and polymer-reinforced composites by using the main fabrication technologies of the area, such as injection and over-moulding but also automated tape laying, 3d press forming, welding (ultrasounds and induction) and additive manufacturing. Also, AIMEN has important background concerning the development of new composites structures with different polymer matrices and embedded fillers (carbon/glass fibres, nano-clays, carbon nanotubes, etc). Some thermoplastic materials AIMEN has shown capabilities to manufacture are: PA, PEEK, PPS, PEI, PAEK, ABS and as well as EPDM- and FKM- based rubbers.	Specifically, within the project Gearbodies, the AIMEN department will acquire a remarkable expertise in the development of elastomer-based composites activated at nanoscale for enhanced mechanical and improved durability.	Exploitation actions to be carried out by AIMEN related to exploit results obtained in Gearbodies are the following: a) Licensing the technology developed to a company to market the; b) Providing services to the industry based on its R + D; c) Promote training and new R + D activities.
9	Methodology and guidelines for processing high-performance elastomer-metal interfaces with improved resistance and durability	X	AIMEN has large experience on developing and manufacturing Composite-Metal and Polymer-Metal interfaces by using the main technologies of the area: Thermoplastic welding: extrusion, hot plate, ultrasound; joining technologies in thermoplastic composites: induction, resistive inserts, ultrasound, low surface tension adhesives; composite welding NDT and bonding with adhesives.	Specifically, within the project Gearbodies, the AIMEN department will acquire a remarkable expertise in the development of Elastomer based nano-composites-Metal buildings by the use of adhesives.	Exploitation actions to be carried out by AIMEN related to exploit results obtained in Gearbodies are the following: a) Licensing the technology developed to a company to market the; b) Providing services to the industry based on its R + D; c) Promote training and new R + D activities.
10	Design and prototype of selected relevant elastomer-based running gear components				
11	Experience on, and knowledge of the feasibility and methodology (including processing guidelines) for potential use of HEA as an alternative solution to traditional steel grades in				

#	Exploitable Product(s)/Measures(s)	Owner-ship claim	Background provided	Foreground developed	Exploitation claim
	journal bearings. This would enable further research to develop feasible and cost-efficient manufacturing processes.				
12	Experience on, and knowledge of the feasibility of use of novel polymer materials for new bearing cage concepts, in combination with different lubricants; also, potential development of novel cage design concept (this would require further research to higher TRL).				
13	Design and prototype of a journal bearing with non-line contact rollers				

Table 4: AIMEN exploitation claims.

Annex 4. CERTH exploitation claims

#	Exploitable Product(s)/Measures(s)	Owner-ship claim	Background provided	Foreground developed	Exploitation claim
1	Thermographic and Ultrasonic data processing, including de-noising, feature extraction and selection, classification modules for detecting, locating and characterising defects in composite samples.	X	Past knowledge on image processing.	Development of the data processing tool that can be used to process thermography images by applying algorithms that will denoise, improve contrast, detect edges and will improve detection of defects in images. CERTH will gain further knowledge on thermographic data processing and specific methods used in thermography related image processing.	Consultancy, Researching, Market Analysis, Help and Support for commercialization.
2	Thermography inspection methodology and prototyping system including all software and hardware components, as well as peripherals for platform integration.	X	No prior knowledge on composite rail carbodies.	Exploitation of the developed methodology for inspecting composite rail carbodies by presenting thermography techniques that have been proven to work in the field and are capable of carrying out this specific task. Exploitation of knowhow.	Consultancy, Researching, Market Analysis, Help and Support for commercialization.
3	Design and development of the ultrasonic inspection methodology and prototyping system including all software and hardware components, as well as peripherals for platform integration				
4	Integrated prototype embedding two NDT inspection methods (thermography and ultrasonic) for various thicknesses and types of composites. Application to rail but also possible	X	Past knowledge on image processing.	Exploitation of the tool for automated data and image post processing that can combine and fuse data from both thermography and ultrasonic methods. Exploitation of the knowhow and the processing	Consultancy, Researching, Market Analysis, Help and Support for commercialization.

#	Exploitable Product(s)/Measures(s)	Owner-ship claim	Background provided	Foreground developed	Exploitation claim
	in automotive, aerospace, etc.			methods that have been deployed. The software could potentially be exploited in the rail industry but also aerospace and others.	
5	Development of a methodology for assessment of running gear elements with potential enhanced lifetime based on Analytic Hierarchy Process (AHP)				
6	Development of a vehicle dynamic models for the simulation of the vehicle behaviour (ex-ante and post-ante)				
7	Development of a methodology for the assessment of running gear LCC				
8	Development of a new elastomer with extended lifetime and reduced LCC				
9	Methodology and guidelines for processing high-performance elastomer-metal interfaces with improved resistance and durability				
10	Design and prototype of selected relevant elastomer-based running gear components				
11	Experience on, and knowledge of the feasibility and methodology (including processing guidelines) for potential use of HEA as an alternative solution to traditional steel grades in journal bearings. This would enable further research to develop feasible and cost-efficient manufacturing processes.				
12	Experience on, and knowledge of the feasibility of use of novel polymer materials for new bearing cage concepts, in combination with different lubricants; also, potential development of novel cage design concept (this would require further research to higher TRL).				
13	Design and prototype of a journal bearing with non-line contact rollers				

Table 5: CERTH exploitation claims.



Annex 5. DICEA exploitation claims

#	Exploitable Product(s)/Measures(s)	Owner-ship claim	Background provided	Foreground developed	Exploitation claim
1	Thermographic and Ultrasonic data processing, including de-noising, feature extraction and selection, classification modules for detecting, locating and characterising defects in composite samples.				
2	Thermography inspection methodology and prototyping system including all software and hardware components, as well as peripherals for platform integration.				
3	Design and development of the ultrasonic inspection methodology and prototyping system including all software and hardware components, as well as peripherals for platform integration				
4	Integrated prototype embedding two NDT inspection methods (thermography and ultrasonic) for various thicknesses and types of composites. Application to rail but also possible in automotive, aerospace, etc.				
5	Development of a methodology for assessment of running gear elements with potential enhanced lifetime based on Analytic Hierarchy Process (AHP)				
6	Development of a vehicle dynamic models for the simulation of the vehicle behaviour (ex-ante and post-ante)	(X)			
7	Development of a methodology for the assessment of running gear LCC				
8	Development of a new elastomer with extended lifetime and reduced LCC				
9	Methodology and guidelines for processing high-performance elastomer-metal interfaces with improved resistance and durability				
10	Design and prototype of selected relevant elastomer-based running gear components				
11	Experience on, and knowledge of the feasibility and methodology (including processing guidelines) for potential use of HEA as an				

#	Exploitable Product(s)/Measures(s)	Owner-ship claim	Background provided	Foreground developed	Exploitation claim
	alternative solution to traditional steel grades in journal bearings. This would enable further research to develop feasible and cost-efficient manufacturing processes.				
12	Experience on, and knowledge of the feasibility of use of novel polymer materials for new bearing cage concepts, in combination with different lubricants; also, potential development of novel cage design concept (this would require further research to higher TRL).				
13	Design and prototype of a journal bearing with non-line contact rollers				

Annex 6. RWTH exploitation claims

#	Exploitable Product(s)/Measures(s)	Owner-ship claim	Background provided	Foreground developed	Exploitation claim
1	Thermographic and Ultrasonic data processing, including de-noising, feature extraction and selection, classification modules for detecting, locating and characterising defects in composite samples.				
2	Thermography inspection methodology and prototyping system including all software and hardware components, as well as peripherals for platform integration.				
3	Design and development of the ultrasonic inspection methodology and prototyping system including all software and hardware components, as well as peripherals for platform integration				
4	Integrated prototype embedding two NDT inspection methods (thermography and ultrasonic) for various thicknesses and types of composites. Application to rail but also possible in automotive, aerospace, etc.				
5	Development of a methodology for assessment of running gear elements with potential enhanced				



#	Exploitable Product(s)/Measures(s)	Owner-ship claim	Background provided	Foreground developed	Exploitation claim
	lifetime based on Analytic Hierarchy Process (AHP)				
6	Development of a vehicle dynamic models for the simulation of the vehicle behaviour (ex-ante and post-ante)	(X)			
7	Development of a methodology for the assessment of running gear LCC				
8	Development of a new elastomer with extended lifetime and reduced LCC				
9	Methodology and guidelines for processing high-performance elastomer-metal interfaces with improved resistance and durability				
10	Design and prototype of selected relevant elastomer-based running gear components				
11	Experience on, and knowledge of the feasibility and methodology (including processing guidelines) for potential use of HEA as an alternative solution to traditional steel grades in journal bearings. This would enable further research to develop feasible and cost-efficient manufacturing processes.				
12	Experience on, and knowledge of the feasibility of use of novel polymer materials for new bearing cage concepts, in combination with different lubricants; also, potential development of novel cage design concept (this would require further research to higher TRL).				
13	Design and prototype of a journal bearing with non-line contact rollers				

Annex 7. LEEDS exploitation claims

#	Exploitable Product(s)/Measures(s)	Owner-ship claim	Background provided	Foreground developed	Exploitation claim
1	Thermographic and Ultrasonic data processing, including de-noising, feature extraction and selection, classification modules for detecting,				



#	Exploitable Product(s)/Measures(s)	Owner-ship claim	Background provided	Foreground developed	Exploitation claim
	locating and characterising defects in composite samples.				
2	Thermography inspection methodology and prototyping system including all software and hardware components, as well as peripherals for platform integration.				
3	Design and development of the ultrasonic inspection methodology and prototyping system including all software and hardware components, as well as peripherals for platform integration				
4	Integrated prototype embedding two NDT inspection methods (thermography and ultrasonic) for various thicknesses and types of composites. Application to rail but also possible in automotive, aerospace, etc.				
5	Development of a methodology for assessment of running gear elements with potential enhanced lifetime based on Analytic Hierarchy Process (AHP)				
6	Development of a vehicle dynamic models for the simulation of the vehicle behaviour (ex-ante and post-ante)				
7	Development of a methodology for the assessment of running gear LCC	(X)			
8	Development of a new elastomer with extended lifetime and reduced LCC				
9	Methodology and guidelines for processing high-performance elastomer-metal interfaces with improved resistance and durability				
10	Design and prototype of selected relevant elastomer-based running gear components				
11	Experience on, and knowledge of the feasibility and methodology (including processing guidelines) for potential use of HEA as an alternative solution to traditional steel grades in journal bearings. This would enable further research to develop feasible and cost-efficient manufacturing processes.				
12	Experience on, and knowledge of the feasibility of use of novel polymer materials for new bearing				

#	Exploitable Product(s)/Measures(s)	Owner-ship claim	Background provided	Foreground developed	Exploitation claim
	cage concepts, in combination with different lubricants; also, potential development of novel cage design concept (this would require further research to higher TRL).				
13	Design and prototype of a journal bearing with non-line contact rollers				

Annex 8. AKKA exploitation claims

#	Exploitable Product(s)/Measures(s)	Owner-ship claim	Background provided	Foreground developed	Exploitation claim
1	Thermographic and Ultrasonic data processing, including de-noising, feature extraction and selection, classification modules for detecting, locating and characterising defects in composite samples.	X	Algorithms for image processing and video tracking. Algorithms for acquisition and fusion and processing of multi-source sensor data.	AKKA supports the development of (joint ownership): - Data processing. - Extraction. - Detection and localisation.	(1) consultancy service towards transportation industry. (2) prototyping and optimized data processing pipeline.
2	Thermography inspection methodology and prototyping system including all software and hardware components, as well as peripherals for platform integration.	X	Algorithms for image processing and video tracking. Algorithms for acquisition and fusion and processing of multi-source sensor data.	AKKA supports the development of (joint ownership): - Inspection scenarios and methodology for Thermography. - inspection software for Thermography.	(1) consultancy service towards transportation industry. (2) prototyping and optimized inspection methodology. (3) Conception and development of demonstration devices related to thermography and inspection.
3	Design and development of the ultrasonic inspection methodology and prototyping system including all software and hardware components, as well as peripherals for platform integration	X	Know-how in development, design & integration of mobile robots (including collaborative). Know-how in development, design & integration of mobile robots (including collaborative).	AKKA supports the development of (joint ownership): - Inspection software for ultrasonic.	(1) consultancy service towards transportation industry. (2) prototyping and optimized inspection methodology for deep flaws.
4	Integrated prototype embedding two NDT inspection methods (thermography and ultrasonic) for various thicknesses and types of composites. Application to rail but also possible in automotive, aerospace, etc.	X	Algorithms and software for robotic applications integration.	We might claim ownership on the entire parts of the mobile robot designed and realized in the project; on the software side, with regards to mobility functions (follower, obstacle detection and avoidance, etc.).	(1) consultancy service towards transportation and robotic industries. (2) prototyping and development robotic related software. (3) Future development of the robotic platform by integrating arms and/or new functionalities for demonstrations purpose.

#	Exploitable Product(s)/Measures(s)	Owner-ship claim	Background provided	Foreground developed	Exploitation claim
5	Development of a methodology for assessment of running gear elements with potential enhanced lifetime based on Analytic Hierarchy Process (AHP)				
6	Development of a vehicle dynamic models for the simulation of the vehicle behaviour (ex-ante and post-ante)				
7	Development of a methodology for the assessment of running gear LCC				
8	Development of a new elastomer with extended lifetime and reduced LCC				
9	Methodology and guidelines for processing high-performance elastomer-metal interfaces with improved resistance and durability				
10	Design and prototype of selected relevant elastomer-based running gear components				
11	Experience on, and knowledge of the feasibility and methodology (including processing guidelines) for potential use of HEA as an alternative solution to traditional steel grades in journal bearings. This would enable further research to develop feasible and cost-efficient manufacturing processes.				
12	Experience on, and knowledge of the feasibility of use of novel polymer materials for new bearing cage concepts, in combination with different lubricants; also, potential development of novel cage design concept (this would require further research to higher TRL).				
13	Design and prototype of a journal bearing with non-line contact rollers				

Table 6: AKKA exploitation claims.



Annex 9. UNEW exploitation claims

#	Exploitable Product(s)/Measures(s)	Owner-ship claim	Background provided	Foreground developed	Exploitation claim
1	Thermographic and Ultrasonic data processing, including de-noising, feature extraction and selection, classification modules for detecting, locating and characterising defects in composite samples.				
2	Thermography inspection methodology and prototyping system including all software and hardware components, as well as peripherals for platform integration.				
3	Design and development of the ultrasonic inspection methodology and prototyping system including all software and hardware components, as well as peripherals for platform integration				
4	Integrated prototype embedding two NDT inspection methods (thermography and ultrasonic) for various thicknesses and types of composites. Application to rail but also possible in automotive, aerospace, etc.				
5	Development of a methodology for assessment of running gear elements with potential enhanced lifetime based on Analytic Hierarchy Process (AHP)				
6	Development of a vehicle dynamic models for the simulation of the vehicle behaviour (ex-ante and post-ante)				
7	Development of a methodology for the assessment of running gear LCC				
8	Development of a new elastomer with extended lifetime and reduced LCC				
9	Methodology and guidelines for processing high-performance elastomer-metal interfaces with improved resistance and durability				
10	Design and prototype of selected relevant elastomer-based running gear components				
11	Experience on, and knowledge of the feasibility and methodology (including processing guidelines) for potential use of HEA as an	(X)			



#	Exploitable Product(s)/Measures(s)	Owner-ship claim	Background provided	Foreground developed	Exploitation claim
	alternative solution to traditional steel grades in journal bearings. This would enable further research to develop feasible and cost-efficient manufacturing processes.				
12	Experience on, and knowledge of the feasibility of use of novel polymer materials for new bearing cage concepts, in combination with different lubricants; also, potential development of novel cage design concept (this would require further research to higher TRL).				
13	Design and prototype of a journal bearing with non-line contact rollers				

Annex 10. VGTU exploitation claims

#	Exploitable Product(s)/Measures(s)	Owner-ship claim	Background provided	Foreground developed	Exploitation claim
1	Thermographic and Ultrasonic data processing, including de-noising, feature extraction and selection, classification modules for detecting, locating and characterising defects in composite samples.				
2	Thermography inspection methodology and prototyping system including all software and hardware components, as well as peripherals for platform integration.				
3	Design and development of the ultrasonic inspection methodology and prototyping system including all software and hardware components, as well as peripherals for platform integration				
4	Integrated prototype embedding two NDT inspection methods (thermography and ultrasonic) for various thicknesses and types of composites. Application to rail but also possible in automotive, aerospace, etc.				
5	Development of a methodology for assessment of running gear elements with potential enhanced	X	AHP algorithms and inputs for improvement of gearbodies	VGTU supports the development and improvement of gearbodies design: AHP data processing.	Consultancy service towards railway transportation sector/

#	Exploitable Product(s)/Measures(s)	Owner-ship claim	Background provided	Foreground developed	Exploitation claim
	lifetime based on Analytic Hierarchy Process (AHP)		design and technical characteristics.		industry.
6	Development of a vehicle dynamic models for the simulation of the vehicle behaviour (ex-ante and post-ante)	X	Modelling of rail vehicle dynamics and simulation of running gear loads.	Adaption of the vehicle dynamic model (in soft package "Universal Mechanism") and contribute to the scenarios and simulations.	Consultancy service towards railway transportation sector/ industry.
7	Development of a methodology for the assessment of running gear LCC				
8	Development of a new elastomer with extended lifetime and reduced LCC	X			Consultancy service towards railway transportation sector/ industry.
9	Methodology and guidelines for processing high-performance elastomer-metal interfaces with improved resistance and durability				
10	Design and prototype of selected relevant elastomer-based running gear components	X			Consultancy service towards railway transportation sector/ industry.
11	Experience on, and knowledge of the feasibility and methodology (including processing guidelines) for potential use of HEA as an alternative solution to traditional steel grades in journal bearings. This would enable further research to develop feasible and cost-efficient manufacturing processes.				
12	Experience on, and knowledge of the feasibility of use of novel polymer materials for new bearing cage concepts, in combination with different lubricants; also, potential development of novel cage design concept (this would require further research to higher TRL).				
13	Design and prototype of a journal bearing with non-line contact rollers				

Table 7: VGTU exploitation claims.

Annex 11. UNIFE exploitation claims

No exploitation claims.

Annex 12. DASEL exploitation claims

#	Exploitable Product(s)/Measures(s)	Owner-ship claim	Background provided	Foreground developed	Exploitation claim
1	Thermographic and Ultrasonic data processing, including de-noising, feature extraction and selection, classification modules for detecting, locating and characterising defects in composite samples.	X	Auto-focus algorithm	Automatic detection of the curvature to adapt to the focal law	Commercialisation
2	Thermography inspection methodology and prototyping system including all software and hardware components, as well as peripherals for platform integration.	X	Ultrasound UT head	Non	Commercialisation
3	Design and development of the ultrasonic inspection methodology and prototyping system including all software and hardware components, as well as peripherals for platform integration				
4	Integrated prototype embedding two NDT inspection methods (thermography and ultrasonic) for various thicknesses and types of composites. Application to rail but also possible in automotive, aerospace, etc.				
5	Development of a methodology for assessment of running gear elements with potential enhanced lifetime based on Analytic Hierarchy Process (AHP)				
6	Development of a vehicle dynamic models for the simulation of the vehicle behaviour (ex-ante and post-ante)				
7	Development of a methodology for the assessment of running gear LCC				
8	Development of a new elastomer with extended lifetime and reduced LCC				
9	Methodology and guidelines for processing high-performance elastomer-metal interfaces with improved resistance and durability				
10	Design and prototype of selected relevant elastomer-based running gear components				
11	Experience on, and knowledge of the feasibility and methodology (including processing guidelines) for potential use of HEA as an				



#	Exploitable Product(s)/Measures(s)	Owner-ship claim	Background provided	Foreground developed	Exploitation claim
	alternative solution to traditional steel grades in journal bearings. This would enable further research to develop feasible and cost-efficient manufacturing processes.				
12	Experience on, and knowledge of the feasibility of use of novel polymer materials for new bearing cage concepts, in combination with different lubricants; also, potential development of novel cage design concept (this would require further research to higher TRL).				
13	Design and prototype of a journal bearing with non-line contact rollers				

Annex 13. SAC exploitation claims

#	Exploitable Product(s)/Measures(s)	Owner-ship claim	Background provided	Foreground developed	Exploitation claim
1	Thermographic and Ultrasonic data processing, including de-noising, feature extraction and selection, classification modules for detecting, locating and characterising defects in composite samples.				
2	Thermography inspection methodology and prototyping system including all software and hardware components, as well as peripherals for platform integration.				
3	Design and development of the ultrasonic inspection methodology and prototyping system including all software and hardware components, as well as peripherals for platform integration				
4	Integrated prototype embedding two NDT inspection methods (thermography and ultrasonic) for various thicknesses and types of composites. Application to rail but also possible in automotive, aerospace, etc.				
5	Development of a methodology for assessment of running gear elements with potential enhanced				



#	Exploitable Product(s)/Measures(s)	Owner-ship claim	Background provided	Foreground developed	Exploitation claim
	lifetime based on Analytic Hierarchy Process (AHP)				
6	Development of a vehicle dynamic models for the simulation of the vehicle behaviour (ex-ante and post-ante)				
7	Development of a methodology for the assessment of running gear LCC				
8	Development of a new elastomer with extended lifetime and reduced LCC	(X)			
9	Methodology and guidelines for processing high-performance elastomer-metal interfaces with improved resistance and durability	(X)			
10	Design and prototype of selected relevant elastomer-based running gear components	(X)			
11	Experience on, and knowledge of the feasibility and methodology (including processing guidelines) for potential use of HEA as an alternative solution to traditional steel grades in journal bearings. This would enable further research to develop feasible and cost-efficient manufacturing processes.				
12	Experience on, and knowledge of the feasibility of use of novel polymer materials for new bearing cage concepts, in combination with different lubricants; also, potential development of novel cage design concept (this would require further research to higher TRL).				
13	Design and prototype of a journal bearing with non-line contact rollers				