

RoCS D7.1 – DISSEMINATION PLAN

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0.2	15.07.2020	First review	G. Quaranta (POLIMI)
0.3	04.08.2020	Integration of all partners contributions	A. Vallan (FPM)
1.0	05.08.2020	Final review, issue of final version	G. Quaranta (POLIMI)

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This project has received funding from the Clean Sky 2 Joint Undertaking (JU) under grant agreement No 831969. The JU receives support from the European Union's Horizon 2020 research and innovation programme and the Clean Sky 2 JU members other than the Union.

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EXECUTIVE SUMMARY

RoCS Deliverable 7.1 presents the overall strategy dedicated to raising awareness, engaging stakeholders, promoting the project and its related results, achievements and knowledge generated of the RoCS project. A sound dissemination strategy will be implemented through different networks related to the project domains. Detailed information about the planned and performed dissemination activities within the project is provided.

The present document aims at providing an insight on the following aspects:

- The overall objectives of the dissemination effort.
- The target public of the RoCS project and the stakeholders interested to know about the outcomes.
- The most effective way to reach the RoCS stakeholders.

1 OBJECTIVES

RoCS communication strategy aims at providing a clear overview on how all the communication channels, activities and tools are working together to address the relevant stakeholder groups (general public, media, institutions, scientific community and industry community). The present document is a specific output of RoCS WP7, however the strategy outlined will not be successful unless all project partners, WP leaders and task leaders will be actively involved and contributing, to maximize the outreach and differentiate the target groups both on a technical and a geographical dimension.

Communication covers all activities related to the visibility and promotion of the project. It includes references to the media and social media activities.

Dissemination and exploitation are closely related to the communication and media activities but refer to more complex definitions which are considering other work packages as well.

The terms ‘exploitation’ and ‘dissemination’ are defined under the Horizon 2020 Rules for Participation¹ as follows:

- Exploitation – ‘means the use of results in further research activities other than those covered by the action concerned, or in developing, creating and marketing a product or process, or in creating and providing a service, or in standardisation activities’;
- Dissemination - ‘means the public disclosure of the results by any appropriate means (other than resulting from protecting or exploiting the results), including by scientific publications in any medium’

From the perspective of Communication, the overall aim of RoCS strategy is

- to contribute to networking and exchange of information and experiences between organisations and networks, to facilitate regular flows of information between project partners and enable partners to receive regular process updates from the pilot projects and case study;
- to support partners in communicating and disseminating their work.

From the perspective of Dissemination activities, the overall aim of the strategy is:

- to inform and raise awareness about RoCS achievements, on the opportunities and advantages offered by the Certification by Simulation approach, and the innovation of the simulation models and technology used by disseminating the approaches and results of the project among relevant stakeholders at the EU, national and subnational levels;
- to establish a network with similar initiatives that are being developed in Europe and around the world: e.g. EASA group that is working on Modelling & Simulation – CS-25 Structural Certification Specifications, AIAA “Community of Interest” on the topic of Certification/Qualification by Analysis;
- to disseminate widely and effectively RoCS outputs through various channels to translate technical language and research findings into appropriate messages for different audiences;
- to influence and educate relevant stakeholders with the aim of positively affecting technology uptake, research and legislative framework development.

¹ Source: REGULATION (EU) No 1290/2013 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 11 December 2013 laying down the rules for participation and dissemination in "Horizon 2020 - the Framework Programme for Research and Innovation (2014-2020)" and repealing Regulation (EC) No 1906/2006. Retrieved from http://ec.europa.eu/research/participants/data/ref/h2020/legal_basis/rules_participation/h2020-rules-participation_en.pdf

2 INTERNAL COMMUNICATION

The first step to achieve an efficient and smooth coordination / implementation of project communication as well as to maximize its result is the internal communication. Before addressing external stakeholder, several internal tools and protocols will be developed, namely the communication ambassador concept, the usage of a common platform, regular updates and regular calls.

The ambassador concept is the most important tool to ensure an effective participation of all consortium members that, as it will be highlighted in the following section, is a key element to boost efficacy and outreach of communication activities. Each project partner has appointed an ambassador, responsible for coordinating both internal and external communication needs and targets to maximize the impact and effectiveness of the project goals. These ambassadors play a crucial role as they will be responsible for putting the multiplier effect in place, creating an impact that can bring greater visibility and outreach to the project, leveraging on each partner's network.

A dedicated RoCS sharepoint subfolder will be used for internal exchange of documents, resulting in a facilitation in co-working.

Internal communication includes also regular calls or dedicated session during project meetings, with a twofold objective:

- To understand how each partner can reinforce and add value to the RoCS overall strategy through their specific competences, resources and activities, and
- To understand how RoCS communication can support each partner in implementing their own actions within communication activities. As an example, this could take form in the support in developing graphics and visuals to accompany a presentation, or to render the data visualization of complex information into infographics.

Internal communication is also important, to achieve the multiplier effect, to gather information about each partner activities that might be a vehicle for RoCS related communication. As an example, it would be possible to access events to showcase the project, provided that the theme is relevant and related to RoCS goals. This content-driven form of communication is also crucial for elaborating an editorial series with partners to place content with media outlets, in particular within the RoCS newsletter and social media channels.

Key message is that successful dissemination requires the collaboration and involvement of all the partners, and for this reason a preliminary set of tasks is foreseen for the whole RoCS consortium:

- To invite colleagues to sign up to the newsletter and follow/interact with RoCS social media;
- To link ROCS website from their websites, as this aims at improving the placement of RoCS on search engines;
- To circulate and disseminate RoCS leaflets, reports and other materials to colleagues and stakeholders who may not be on the mailing list;
- To make presentations referring to the project or making presentations directly on RoCS at relevant events and conferences, always displaying the logo and referring to the website;

- To share within the consortium RoCS-related presentations made at conferences or other events;
- To provide original content, materials or other kind of external information useful for animating RoCS social media channels;
- To make use of their organisation communication tools to help disseminate RoCS (i.e. website, newsletters, online magazines, blogs, social accounts, etc.)
- To keep records of all presentations and other kinds of dissemination activities carried out, needed for EC reporting purposes.

3 EXTERNAL COMMUNICATION

3.1 LANGUAGE

The language of RoCS is English. To ensure consistency, the consortium will commit to ensuring adherence to British English spelling conventions whenever possible. To avoid unnecessary editorial work at later stages, the guidelines in the EC DG Translation English Language Style Guide will be adopted.

3.2 TARGET AUDIENCE AND STAKEHOLDERS

The most important aspect for communicating project results is that ROCS findings are disseminated widely to its different target audiences.

These groups cover the spectrum of potential targets of the project achievements and have been identified as follows:

- The general public and the persons interested in simulation and in aviation topics in general.
- Media, who can leverage the diffusion of project activities and achievements.
- Institutions at different levels, who will be informed of how CSJU funding is contributing to tackling societal challenges.
- Scientific community: research and academic organizations, scientific committees, scientific journals, and working groups.
- Industry community: industries and industry-oriented associations involved who can indirectly benefit from the project results and potentially develop businesses complementary to those addressed by the direct beneficiaries (addressed by dissemination activities), such as the development of simulation technologies for applications different from aviation.

Moreover, RoCS can rely on the extensive network of its partners, upon which a rich and complete contacts database can be exploited for maximizing communication and dissemination outreach.

3.3 STAKEHOLDER ANALYSIS AND MAPPING

POLIMI as coordinator will run a preliminary task of stakeholder analysis and mapping with all partners.

The aim of the stakeholder analysis is to identify how RoCS will affect or be affected by different groups of relevant stakeholders. It will sort them according to their impact on the project and the impact the action will have on them. This information will be used to target dissemination activities. The Stakeholder Analysis

will be used to assess how effectively RoCS achievements will be disseminated, and assess if targeted efforts are needed to reach certain stakeholders or audiences.

The aim of the stakeholder mapping is to identify and map out the key organisations and professionals relevant for RoCS and to communicate with and influence them. The map document will therefore list names and email addresses by interest area. This information will be used to create a comprehensive mailing list (while adhering to GDPR regulation).

RoCS partners will make use of their networks and create several mailing lists to ensure the communication with all the audiences. As a first estimation, an average of 1000 relevant contacts will be included in the mailing list throughout the project.

The first step will require input from all partners. Each partner will be required to provide a list of relevant people based on the target groups identified. The information will be collected by POLIMI and included in the RoCS mailing list. The exercise will be conducted on a regular basis and updates will be requested from partners along the projects' implementation process.

The results of the stakeholder analysis will be discussed at project meetings and circulated to partners for additional comment and additions.

3.4 VISUAL IDENTITY AND COMMUNICATION TOOLS

The visual identity of the project will differentiate RoCS while making it immediately recognizable. The logo is conceived as the main visual messenger of the project and it will be reflected in all the communication materials.



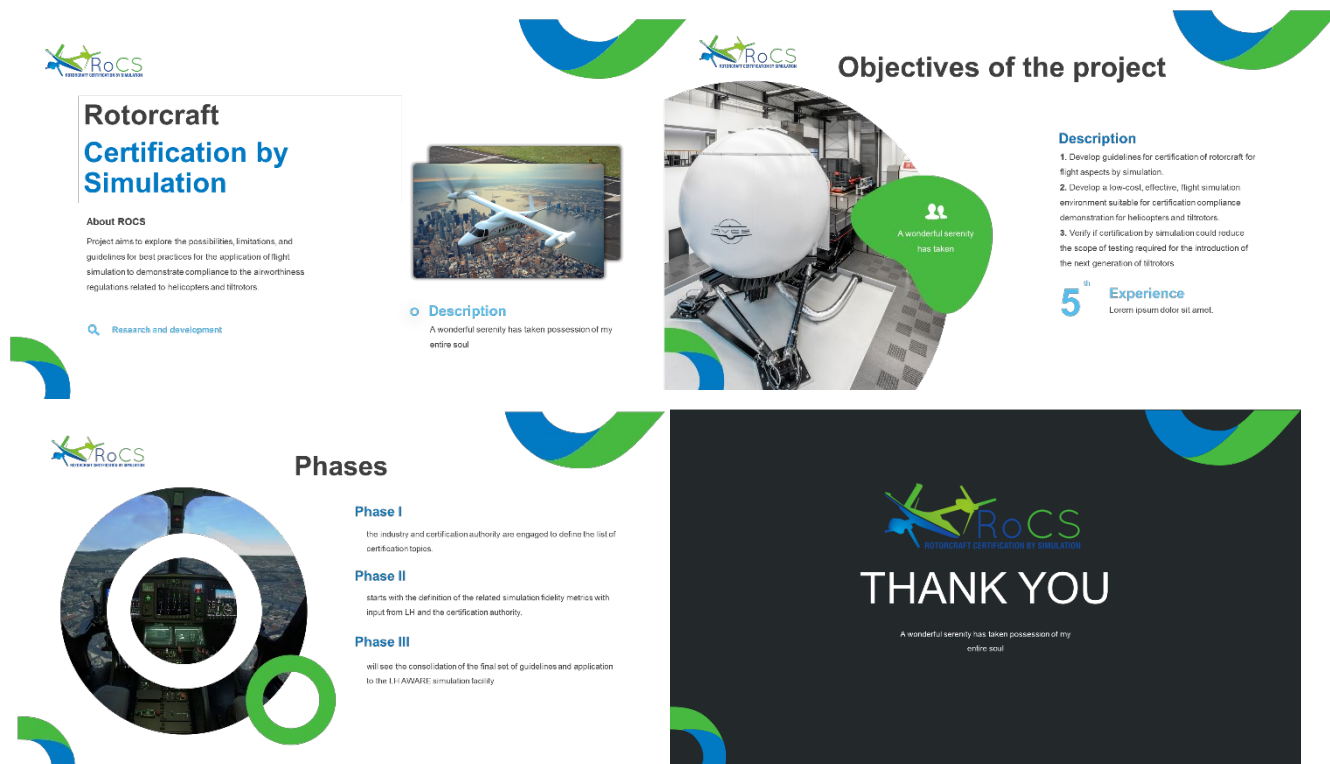
The main project elements are included in the logo, in the effort of making immediately recognizable and conveying the highest number of information as possible: the project acronym, the project title, the rotorcraft silhouette (to identify the project domain and the rotorcraft involved) and the CS2 colour code (to recall the funding program).

Based on RoCS visual identity (logo and branding), templates for Microsoft Word and Microsoft PowerPoint were developed. These must be used by all RoCS partners throughout the full duration of the project.

The word template, as visible in the present document, is very linear and clean, to avoid unnecessary graphical burdens that might distract the reader. The logo is present, together with the colour code and the reference to the CS2JU and the EU flag. The document structure is fixed and must include the disclaimer that provides clear reference to the funding scheme.

The power point template was developed following the same logic, however including some graphical improvements to make ROCS presentations appealing and catchy. All the key elements are present, including logo and funding source evidence, while adopting the correct colour code and schemes.

Some screenshots are provided here below as a reference.



3.5 WEBSITE

3.5.1 General features and Description

RoCS website is the main communication and dissemination platform, allowing project stakeholders to access the project development and results. The main public deliverables and documents will be hosted in a dedicated section, and the most relevant content (news, editorials, videos, infographics, events, etc.) will be disseminated, with the aim of fostering the stakeholder engagement. RoCS website will also be used to share the public results of the project; it will contain downloadable PR material, including leaflets, pictures and short movies of project results, explained appropriately for the general public.

A minimum number of 1000 personal accesses with at least the 30% spending more than 2 minutes on the website is foreseen.

The website template is built with a responsive design to fit into any screen size. Responsive web design provides a customized viewing experience for different browser platforms, displaying a different and optimized interface depending on what device is used to access the site. The template consists of a horizontal structure fully customized with RoCS visual identity, integrating a mouseover menu, horizontal static banners (i.e. dedicated newsletter subscription), vertical thematic blocks (i.e. on the project impact) and a footer containing the required disclaimer and the contact info where the audience can get easily in contact with the project via e-mail or via social networks. The domain name is 'rocs-project.org' and it has been acquired and will be maintained for 5 years.

All project partners contributed to the structure and contents of the website, and will moderate the content. At the present stage, four main sections are composing the site: 1.HOME, 2.PROJECT, 3.PARTNERS, 4.CONTACT US. The WordPress template allows for extreme flexibility, thus further sections will be easily and quickly implemented upon necessity. Further detail on the sections is provided in the following paragraph.

3.5.2 Website Map

1. Homepage

- The header menu and header image include immediate reference to the logo, the rotorcraft and the project title, for immediate identification with the coordinated visual identity.
- The homepage body gives quick insights on the project objectives, phases and impact, providing quick messages and graphical hints to help the reader identify quickly the main elements.
- The partners bar gives quick visibility to RoCS partners, links point to full descriptions.
- The footer contains the newsletter subscriptions and the main contact information. It will be updated with social media channels links.

2. Project

- Objective and phases: this page provides the reader with a detailed insight on RoCS objectives and the three main project steps to achieve them.
- Impact of RoCS contains full details on the main benefits for the rotorcraft industry and the RoCS expected impacts.

3. Partners

- This page contains detailed description of the project partners. Each section can be expanded for further details.

4.Contact Us

3.5.3 Screenshots

The following pages contain the screenshots of the website, including the homepage, the objectives section, the impact section, the partner section and the contact page.



About RoCS

Project aims to explore the possibilities, limitations, and guidelines for best practices for the application of flight simulation to demonstrate compliance to the airworthiness regulations related to helicopters and tiltrotors.



Objectives of the project

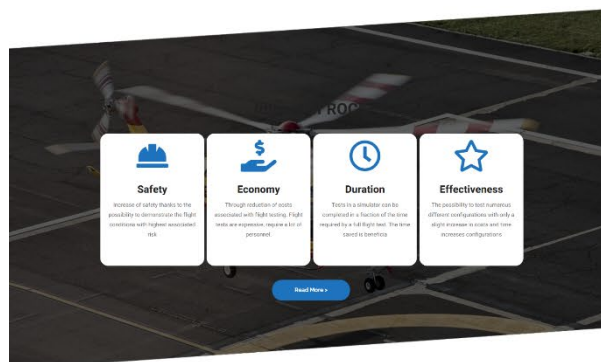
- Develop guidelines for certification of rotorcraft for flight aspects by simulation
- Develop a low-cost, efficient, flight simulation environment suitable for certification compliance demonstration for helicopters and tiltrotors
- Verify flight simulation by simulation tool reduce the scope of testing required for the introduction of the new generation of tiltrotors

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Phases of the project

- Phase I: the industry and certification authority are engaged to define the list of certification topics
- Phase II: starts with the definition of the related simulation facility needs with input from the certification authority
- Phase III: will see the consideration of the test set-up guidelines and application to the CH AIRMEE simulation facility

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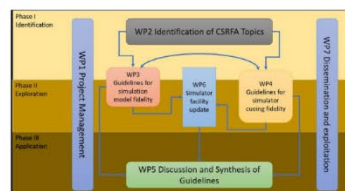



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Project Objectives and Phases



Project Objectives

Develop guidelines for certification of rotorcraft for flight aspects by simulation

Certification of rotorcraft by flight simulation has been exploited in the past on a case-by-case basis to reduce the cost and flight test safety risks associated with certification. To allow the exploitation of this approach by all relevant stakeholders, it is necessary to consolidate past experience and dedicated research into a set of guidelines supported by both the industry and the certification authority. The methodology defined will include the selection of the metrics to be used for model and cueing systems fidelity. Rotorcraft models and simulation cueing systems must be evaluated in terms of agreed metrics. RoCS will develop a set of standard tools to be used to evaluate these metrics in a fast, efficient and reliable way.

Develop a low-cost, effective, flight simulation environment suitable for certification compliance demonstration for helicopters and tiltrotors

Flight simulators are traditionally defined for training, with a focus on the positive transfer generated on the trainee. The development of a FS for certification purposes requires a change from this point of view, because for certification the models must be both high fidelity and physically representative of the aircraft, to ensure that the correct response of the actual aircraft will be simulated in the FS. This may also be outside of the OFE, or the envelope tested during flight tests. In this situation, pilot cueing is important as far as it is able to trigger the correct behaviour of the pilots who are testing the capabilities of the vehicle to be certified. Consequently, a new product has to be developed, that must be competitive in terms of acquisition and maintenance costs in comparison to flight tests, and affordable also by small companies, to be a driver for the development of new certified aircraft.

Verify if certification by simulation could reduce the scope of testing required for the introduction of the next generation of tiltrotors

The introduction of a flying vehicle with a new configuration often introduces many uncertainties in the definition of the correct CS to be applied, and consequently in the choice of definition of appropriate testing to demonstrate safety. The availability of guidelines for CSRA verified on tiltrotors will represent a formidable tool to compensate for the lack of experience of both the manufacturers and the certification authorities, limiting significantly the amount of hazardous flight testing to be performed.

Project Phases

Phase I

The industry and certification authority are engaged to define the list of certification topics that are thought to be suitable for compliance demonstration by flight simulation (WP2). A subset of these will be selected for case study in the next phase. In parallel, WP3 and WP4 will work on the identification of the starting points for the investigations, with the definition of the related simulation fidelity metrics with input from LH and the certification authority. These metrics will then be tested against the baseline simulation models and facilities available at LH representing the current industry state-of-the-art. Additionally, in WP5 a thorough analysis of the current LH FS hardware and software, and future requirements, will be performed to develop a plan for the required initial improvement of the existing FS helicopter cabin. The initial improvements will be implemented before the end of Phase I to enable the assessment of the agreed fidelity metrics of the LH FS with the upgraded hardware.

Phase II

starts with the definition of the related simulation fidelity metrics with input from LH and the certification authority. After the identification of the capability gaps, improvements to the flight simulation models and simulator cueing environment will be investigated using models provided by LH and consortium simulation facilities. Concerning modelling, current helicopter and tiltrotor models will be developed and tested for the specific CSRA topics identified for demonstration within the project. In light of the time constraints of the project, the LH simulator upgrade will be performed in parallel with the other activities. The findings of Phase II will be incorporated in a preliminary set of guidelines for interim evaluation by the certification authority. WP6, in close connection with WP4, will develop a design for the new FS hardware, which fulfils requirements (as much as possible) determined in WP4.

Phase III

will see the consolidation of the final set of guidelines and application to the LH AWARE simulation facility, and demonstration through application to models of the Next Generation Civil Tilt Rotor Technology Demonstrator (NGCTR-TD) and the NGCTR New Tilt Rotor Concept (NGCTR-NTC). Piloted simulations will be performed, initially on the helicopter selected by LH. These will be followed by verification of the applicability of the proposed approaches to the NGCTR tiltrotor models.



About Us

Rotorcraft Certification by Simulation



Contact Details

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Impact of ROCS



The expected benefits will be on:

1. Safety

Increase of safety thanks to the possibility to demonstrate the flight conditions with highest associated risk, such as those concerning evaluation of emergency conditions and procedures, in a virtual environment. Additionally, the overall reduction of flight hours will be beneficial for the overall safety of the personnel involved in the certification operations.

2. Economy

through reduction of costs associated with flight testing. Flight tests are expensive, require a lot of personnel and are often dependent on prevailing environment conditions. Additionally, virtual testing eliminates the risk of damage, and the associated cost, to the test aircraft.

3. Duration

Tests in a simulator can be completed in a fraction of the time required by a full flight test. The time saved is beneficial in shortening the time required for new or supplemental rotorcraft certification. Reducing the time to market increases the competitiveness of the European rotorcraft industry.

4. Effectiveness

The possibility to test numerous different configurations with only a slight increase in costs and time increases the number of configurations and scenarios that can be evaluated. Pilots are able to familiarise themselves with manoeuvres for investigation and to choose the best approach to achieve the goal of the test. A simulator test can be interrupted and repeated, all the while gathering detailed information about physical parameters that could not realistically be acquired with a normal instrumentation suite on a test aircraft.

The following impacts are expected:

1. Decrease the risks associated with rotorcraft certification compliance demonstration.

The safety of certification flight testing can be improved by demonstrating compliance through flight simulation. The most demanding and hazardous flight tests can be performed in a virtual environment to minimise the exposure to potentially hazardous test conditions. In particular this includes tests close to the boundaries of the OFE and cases where the effects of failures have to be demonstrated. The flight tests necessary to validate the flight simulator models shall, in contrast, be comparatively low-risk.



2. Promote a better industry and authority understanding of the rotorcraft characteristics by increasing flight test effectiveness in terms of data gathered and number of configurations evaluated.

During flight simulation it is possible to collect a large amount of test data that cannot be easily measured during a test flight. Additionally, it is possible to perform a large number of repetitions to assess flying variability without substantially increasing costs and with no additional risk. Similarly, a large number of different aircraft configurations (in terms of mass, position of the CG, environmental conditions, failure modes, etc.) can be tested with only a slight increase in the overall cost. The certification by simulation approach is expected to increase by a large amount the insight of the industry and the certification authority.

3. Reduce cost of rotorcraft certification

It is very difficult to gather direct quantitative evidence of the cost savings produced using flight test simulations. The prevention of potential accidents during flight test activities justifies the choice to use simulation. Two aspects must be considered: the proposed low cost COTS flight simulator configuration will be designed looking for the best trade-off between effectiveness and cost. It will be possible to realise a significant saving of the cost per hour of flight, considering of course the added cost of the engineers involved in the model development, validation and verification. Additionally, initial simulation testing can, in some instances, be performed during the aircraft development phases, shortening considerably the time required for certification. Certification of aircraft with innovative configurations (like tiltrotors, or VTOLs) may require a significant increase in the time required also due to the necessity to establish appropriate means of compliance for a new, and somehow uncertain due to lack of experience, vehicle. Simulation for certification could really represent a game-changer in this case.

4. Reduce the time required to complete rotorcraft certification, and so the time-to-market of new products

New helicopter certification could be achieved in an average time close to 3 years from the first flight. Sometimes this time is however more than 5 years. The time spent to set up a single flight test can be very large, and it may involve the coordination of a large crew. Replacing flight tests with pilot-in-the-loop simulation offers a potential reduction in personnel involved of 99%. Of course this reduces the time required to organise and conduct tests. Specific environmental conditions may also dictate where flight tests must be held, leading to considerable reduction in time and effort spent to research and secure suitable test sites, ensuring conditions are suitable, and transporting all crew, aircraft, and equipment. It is clear to see how simulation offers a cost benefit in this respect. Additionally, initial simulation testing can, in some instances, be performed during the aircraft development phases, shortening considerably the time required for certification. Certification of aircraft with innovative configurations (like tiltrotors, or VTOLs) may require a significant increase in the time required also due to the necessity to establish appropriate means of compliance for a new, and somehow uncertain due to lack of experience, vehicle. Simulation for certification could really represent a game-changer in this case.

5. Define a new family of flight simulator

The outcomes of RoCS are expected to form the first steps in the classification of simulation devices for CSRA topics. In the same way as categorises training simulators based on their fitness-for-purpose, initial work conducted in RoCS will form the basis of this categorisation for certification simulators. This is both in terms of model and costing fidelity. The intention in RoCS is to perform evaluations using a small agreed set of CSRA topics agreed during the project. The suitability of simulation devices and models will be determined, leading to a first classification of simulation fidelity. The initial proof of concept for these topics will then likely form the starting point for the generation of new standards for this area.



Deutsches Zentrum fuer Luft – Und Raumfahrt Ev (DLR)

DLR (english: German Aerospace Center) is the national aeronautics and space research centre of the Federal Republic of Germany. Its extensive research and development work in aeronautics, space, energy, transport and security is integrated into national and international cooperative ventures. In addition to its own research, as Germany's space agency, DLR has been given responsibility by the federal government for the planning and implementation of the German space programme.

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GIEI srl

GIEI srl was founded in October 19th 2016, from the merger of two societies ASEI and XESA SYSTEMS with the historical brand RGM IMPIANTI. GIEI headquarter and manufacturing plant are based in Cremona, reliability and efficiency together with a great experience in this field are those always known but validated by the force of three brands that propose to market in a strong synergy among them. All clients can take prompt advantage of this process both in terms of technical know-how and from the point of view of proposed solutions, now complete at every effect, integrated and studied to satisfy every specific need.

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Liverpool John Moores University (LJMU)

Liverpool John Moores University (LJMU) was founded in 1823 in Liverpool that was to revolutionise education and provided opportunities for the working people of the city. Today, with a vibrant community of 25,000 students from over 100 countries worldwide, 2,500 staff and 250 degree courses, LJMU is one of the largest, most dynamic and forward-thinking universities in the UK.

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POLITECNICO MILANO 1863

Politecnico di Milano Coordinator

Established in 1863, Politecnico di Milano (POLMI) is among the leading scientific and technological universities in Europe and it is the largest Technical University in Italy for Engineering, Architecture and Industrial Design. Its premises are spread over 7 campuses for better interaction with local communities and private companies. According to QS Ranking 2015, Politecnico holds the 22nd position in the world, the 8th in Europe and the 1st in Italy in the fields of Mechanical, Aeronautical & Manufacturing Engineering.

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Stichting Nationaal Lucht – En Ruimtevaartlaboratorium (NLR)

The Netherlands Aerospace Centre (NLR) (former company name: National Aerospace Laboratory) is an independent non-profit organisation that provides technological support to aerospace industries, to operators of civil and military aircraft, airports and ATC systems, to authorities, and to international organisations all over the world. NLR is a customer-oriented research organisation, working under national and international contracts in projects concerning aircraft development, aircraft operations, and space technology.

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The University of Liverpool (LIV)

The University of Liverpool is a public university based in the city of Liverpool, England. Founded as a college in 1881, it gained its royal charter in 1903 with the ability to award degrees and is also known to be one of the six original "red brick" civic universities. It comprises three faculties organized into 35 departments and schools. It is a founding member of the Russell Group, the N8 Group for research collaboration and the University Management school is AACSB accredited.

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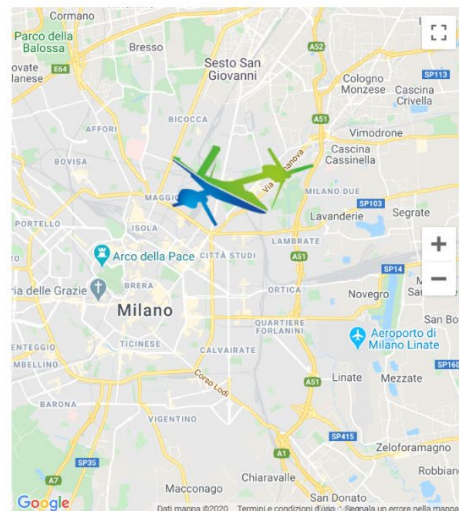
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About Us

Rotorcraft Certification by Simulation



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3.6 LEAFLET / BROCHURE

RoCS leaflet is conceived as a short and catchy presentation of the project, in a light and portable format. It includes the key messages, with the aim of making the user curious about the project, while providing brief information on the RoCS approach and innovations. The aim of the leaflet is that of attracting people to find out more about RoCS, to visit the website and in general to raise awareness among the target stakeholders. It will be used for dissemination and promotion purposes at external conferences, meetings or seminars. A preview of RoCS leaflet is provided here below:

Front

Impact

Decrease the risks associated with rotorcraft certification compliance demonstration
The safety of certification flight testing can be improved by demonstrating compliance through flight simulation. The most demanding and hazardous flight tests can be performed in a virtual environment to minimise the exposure to potentially hazardous test conditions.

Promote a better industry and authority understanding of the rotorcraft characteristics by increasing flight test effectiveness in terms of data gathered and number of configurations
During flight simulation it is possible to collect a large amount of test data that cannot be easily measured during a test flight. Additionally, it is possible to perform a large number of repetitions to assess pilot variability without substantially increasing costs and with no additional risk.

Reduce cost of rotorcraft certification evaluated.
A significant cost saving will be realised considering the better value for money potential of simulated tests. Simulation can reduce the required flight testing for SHOL qualification by up to 70%, generating a significant reduction in cost. These cost savings are also expected to be achievable for certification topics investigated in RoCS.

Reduce the time-to-market of new products
New helicopter certification could be achieved in an average time close to 3 years from the first flight. Sometimes this time is however more than 5 years. The time spent to set up a single flight test can be very large, and it may involve the coordination of a large crew. Replacing flight tests with pilot-in-the-loop simulation offers a potential reduction in personnel involved of 99%. Of course this reduces the time required to organise and conduct tests.

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Rotorcraft Certification by Simulation

Project aims to explore the possibilities, limitations, and guidelines for best practices for the application of flight simulation to demonstrate compliance to the airworthiness regulations related to helicopters and tiltrotors.

Contact us now

Rotorcraft Certification by Simulation
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www.rocs-project.org

Rear



Objectives of the project

- Develop guidelines for certification of rotorcraft for flight aspects by simulation**
Certification of rotorcraft by flight simulation has been exploited in the past on a case-by-case basis to reduce the cost and flight test safety risks associated with certification. To allow the exploitation of this approach by all relevant stakeholders, it is necessary to consolidate past experience and develop guidelines supported by both the industry and the certification authority.
- Develop a low-cost, effective, flight simulation environment suitable for certification compliance demonstration for helicopters and tiltrotors**
Flight simulators are traditionally defined for training, with a focus on the positive transfer generated on the trainee. The development of a FS for certification purposes requires a change from this point of view, because for certification the models must be high fidelity physically representative of the aircraft and not the result of flight test identification, to ensure that the correct response of the actual aircraft will be simulated.
- Verify if certification by simulation could reduce the scope of testing required for the introduction of the next generation of tiltrotors simulation**
The introduction of a flying vehicle with a new configuration often introduces many uncertainties in the definition of the correct certification standard to be applied, and consequently in the choice of appropriate testing to demonstrate safety. The availability of guidelines for certification by simulation verified on tiltrotors will represent a formidable tool to compensate for the lack of experience of both the manufacturers and the certification authorities, limiting significantly the amount of hazardous flight testing.

Impact of ROCS

The expected benefits will be on:

- Safety**
Increase of safety thanks to the possibility to demonstrate the flight conditions with highest associated risk.
- Economy**
Reduction of costs associated with flight testing both in terms of flight hours, and reduction of personnel involved.
- Duration**
Tests in a simulator can be completed in a fraction of the time required by a full flight test.
- Effectiveness**
Possibility to test numerous configurations with only a slight increase in costs and time.

Project Phases

Phase I
The industry and certification authority are engaged to define the list of certification topics that are thought to be suitable for compliance demonstration by flight simulation. A subset of these will be selected for case study in the next phase. In parallel, WP3 and WP4 will work on the identification of the starting points for the investigations, with the definition of the related simulation fidelity metrics with input from Leonardo Helicopters and the certification authority.

Phase II
Starts with the definition of the related simulation fidelity metrics with input from Leonardo Helicopters and the certification authority. After the identification of the capability gaps, improvements to the flight simulation models and simulator coupling environment will be investigated using models provided by Leonardo Helicopters and consortium simulation facilities.

Phase III
Will see the consolidation of the final set of guidelines and application to the Leonardo Helicopters simulation facility, and demonstration through application to models of the Next Generation Civil Tilt Rotor Technology Demonstrator (NGCTR TD) and the NGCTR New Tilt Rotor Concept (NGCTR NTTC). Phased simulations will be performed, initially on the helicopter selected by Leonardo Helicopters. These will be followed by verification of the applicability of the proposed approaches to the NGCTR tiltrotor models.



3.7 POSTERS / ROLL-UP

Upon necessity, the visual identity implemented for RoCS will be customized and turned into the project Roll-up or poster. The Roll-up and the poster will be used as RoCS branding material during RoCS events and events where RoCS is participating, meant to bring attention to the project and expand its brand. The main aim is indeed to advertise RoCS, strengthen its brand identity, raise awareness and interest about the project and drive traffic to the website and the social media.

At present stage the consortium is still evaluating the need of a roll-up, which will be quickly produced whenever deemed necessary for enhancing RoCS visibility at public events.

3.8 VIDEOS AND INFOGRAPHICS

Video content will be used to increase the visibility of the project. To showcase the project ambitious project a first video will be created, integrating animated graphics (either vectorial or 3D) and stock clips. Again the main aim is to engage stakeholders and partners in the project dissemination, providing a quick and direct tool. This will be used on all the communication channels described in the communication plan to make sure that all the key stakeholders are exposed to the relevant message.

3.9 REPORTS AND BRIEFS

RoCS reports and briefs will outline the key learning and recommendations of the project, and will be written in such a way that the project's messages will be clearly and effectively disseminated. They will be produced in the form of short manuals, giving a precise glimpse on what should be done for rotorcraft certifications. Directions, indications and guidelines will be included, in a catchy and user-friendly form so that the interest to investigate further will be stimulated in the reader. The language will be intermediate, in comparison to the deliverables which, on the other hand, will be very technical and so not suitable for a broader group of stakeholders.

3.10 E-NEWSLETTER

RoCS newsletter will be a fundamental tool to grant both communication and dissemination at different levels (both EU and international), and will keep the stakeholder engagement level high providing insights on the findings of the project, informing about other relevant events, publications, key guideline developments, key messages of the project partners. At least 4 newsletters are planned throughout the project, depending on available content.

The aims of RoCS newsletter can thus be summarized as follows:

- Informing project stakeholders on the key findings of the project.
- Providing information about relevant external events and publications.
- Disseminating key messages from the Coordinator and the WP leaders.
- Ensuring that key stakeholders are kept up-to-date on key developments at EU level.

The target recipients will be the Consortium members, RoCS self-subscribers and the mailing list recipients as resulting from the Stakeholder Mapping activity.

RoCS newsletter will be developed in line with the project visual identity, to ensure coherence and make the communication easily recognizable through RoCS brand.

Each newsletter issue will be scalable, including all foreseen elements or just a selection, according to the available content. A preliminary structure can be summarized as follows:

- RoCS Editorial – An opening article (average 200-300 words) on a key topic, written by an expert.
- Additional feature(s) – Supporting features of average 200-400 words on a topic related to the Editorial, the article sources can be external.
- RoCS Update – An insight on the current status of the project and on the next steps. It provides an update of current achievements (e.g. new milestones, deliverables, outputs and events), and it will be understandable for both old and new subscribers.
- News & Events – short items about relevant events and guideline developments.
- Articles and publications – A “tips” section for the readers, including selected documents and research relevant to RoCS work suggested by WP leaders and all partners. The content will include and reference title, author(s), link, and/or one-line synopsis.

3.11 SOCIAL MEDIA CHANNELS

Twitter and LinkedIn will be the main social media channels to be used for the dissemination of RoCS because of their complementarity in addressing the stakeholder groups.

At least 300 followers will be attracted and engaged via social media. For an effective dissemination of RoCS in social media, it is vital for the partners to contribute to the content. Original content will lead to incremental reach and traffic for both social media channels, as well as the website.

The key elements of the social media strategy that will be implemented for RoCS can be summarized as follows:

- Project partners, through the communication ambassadors, will be required a very high participation in providing contributions to gather content for social dissemination.
- A precise publishing schedule will be implemented. This schedule will be specific for each type of social media: while LinkedIn will require high-level contribution with a slower rate, Twitter will require a higher effort with constant animation.
- The consortium will also be required active participation in sharing RoCS content, again to increment the outreach of social media activity.
- A specific effort will be put on collecting and disseminating external events related to RoCS domain, to reach, with the correct use of hashtags and references, the public of those events.
- The coordinator will implement a constant press review, to collect the most interesting original materials.
- A benchmark list will be implemented: all potential “competitors” will be mapped, to stimulate the interaction with them and boosting the cascade effect.
- The contribution of the Consortium will finally be requested for the scientific validation of all the information that will be shared via the social media: the aim is that of providing the highest level

information possible while ensuring that all the information is fully understandable by the broad stakeholder public.

3.12 MEDIA RELATIONS

Medias are crucial to help spreading the word to the target audience and the interested public. They will not only increase knowledge about RoCS project but also on its findings, results and recommendations.

As long as ROCS is a very technical and sectorial project, the C&D plan initially foresees a very targeted media relation activity, as the reference public must be able to understand the technical content developed. The aim is to broaden the focus at a later stage, when the results will start having a precise impact that could be delivered to a greater public.

Project partners have a wide network of journalists and a great experience in engaging media, which will be encouraged to keep in contact throughout the project. A preliminary list of media outlets to be engaged is reported here below:

- Vertiflite <https://vtol.org/publications/vertiflite-magazine>
- Vertical <https://www.verticalmag.com/>
- Aviation Week <https://aviationweek.com/>
- Flight International <https://www.flightglobal.com/>

3.13 CONFERENCES AND FAIRS

The participation to international conferences and fairs is also foreseen, to boost consortium and project results visibility. At least 500 people from relevant stakeholder groups is expected to be exposed to RoCS through this activity.

The initial tentative list of conference foreseen follows:

- European Rotorcraft Forum 2021, Glasgow, UK
- Vertical Flight Society Annual Forum 2021 <https://vtol.org/>
- Helitech 2021 <https://www.tradefairdates.com/Helitech-World-Expo-M9879/London.html>
- Rotorcraft and VTOL Symposium 2020 <https://www.easa.europa.eu/newsroom-and-events/events/rotorcraft-and-vtol-symposium-2020>
- Salon du Bourget 2021 <https://www.siae.fr/>
- ILA Berlin 2022 <https://www.ila-berlin.de/en>

Two dedicated RoCS events are also foreseen: a public workshop within EASA Rotorcraft Symposium in 2021 and RoCS final showcase workshop, still to be defined in terms of location and tentative date.

3.13.1 Meeting attendance and presentation report

The table below will be used and returned to POLIMI every time a presentation is made or materials are distributed at an external event. This will help to keep track of where key messages are being disseminated, what those messages are, and where (stakeholder type/policy area) we might expand efforts to disseminate the project's work. Information collected is also required for EC reporting purposes.

RoCS partner organization	
Member of the staff responsible for the activity	
Title of the event/meeting	
Date & location	
Organizer	
Target audience (e.g. researchers, policy makers, etc.).	
Estimation number of the target audience reached	
Method (e.g. Power Point presentation, discussion, poster display, dissemination of leaflets (and numbers thereof), etc.)	
What were the key messages?	
Any follow up or additional notes?	