ECSEL Research and Innovation actions (RIA)

AMASS

Architecture-driven, Multi-concern and Seamless Assurance and Certification of Cyber-Physical Systems

Dissemination and Training Progress (b)
D8.7

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Abbreviations and Definitions

ACM	Association for Computing Machinery
ARTEMIS	ARTEMIS Industry Association is the association for actors in Embedded Intelligent Systems within Europe
BSc	Bachelor of Science
CA	Consortium Agreement
CACM	Common Certification and Assurance Metamodel
CPS	Cyber-Physical Systems
CS	Case Study
EAB	External Advisory Board
EC	European Commission
ECSEL	Electronic Components and Systems for European Leadership
ESA	European Space Agency
EWICS	European Workshop on Industrial Computer Systems
FMEA	Failure Mode and Effects Analysis
GA	Grant Agreement
GARTEUR	Group for Aeronautical Research and Technology in Europe
IEEE	Institute of Electrical and Electronics Engineers
IMBSA	International Symposium on Model Based Safety Assessment
INCOSE	International Council on Systems Engineering
IoT	Internet of Things
ISO	International Organization for Standardization
JU	Joint Undertaking
MASP	Multi Annual Strategic Plan
MBA	Model-Based design methodology for Assessing performance and safety requirements of critical systems
MDSafeCer	Model Driven Safety Certification
MSc	Master of Science
MUS/MSS	Minimal Unsatisfiable Subsets/Maximal Satisfiable Subsets
OEM	Original Equipment Manufacturer
OSLC	Open Services for Lifecycle Collaboration
PESI	Plataforma Tecnológica Española de Seguridad Industrial (Spanish Technology Platform on Industrial Safety)
PhD	Doctor of Philosophy
R&D	Research & Development
R&I	Research & Innovation
SAE	Society of Automotive Engineers
SME	Small and Medium-sized Enterprise
STPA	System-Theoretic Process Analysis
SVN	Subversion
SysML	System Modelling Language
TELERISE	International Workshop on Technical and Legal Aspects of Data Privacy and Security
WP	Work Package

Executive Summary

This document (D8.7) is the second progress report on dissemination and training activities for the AMASS project. These activities, which are essential for the success of the project, allow different stakeholders to gain awareness of the achievements of the project and of how to use its results. D8.7 presents the activities performed from m13 (April 2017) to m24 (March 2018) in AMASS.

The progress on dissemination can be divided into internal and external activities. The internal activities performed correspond to the design, configuration, and deployment of the project's wiki, SVN repositories, and mailing lists. For external dissemination, AMASS has a website with a wide range of content, including public deliverables and blog posts about project news. The partners have contributed to maintaining the project presentations, leaflet, and poster as dissemination material, and have been active in social media through LinkedIn and Twitter, in event organisation (four main events; SAFECOMP, DECSoS, IMBSA, and SASSUR), and event participation (other 27 events). In addition, 24 scientific publications have been accepted at different journals, conferences, and workshops. Communication activities have also been performed, such as press releases, blog posts, two project newsletters, and the advertisement of AMASS on the partners' websites. A YouTube channel has been created to share videos with wide audiences about AMASS results.

Regarding training, a training session about the new version of the AMASS tools has been arranged. The resulting videos have been publicly published. Progress has also been made on research training related to BSc, MSc, and PhD students, and to the presentation of the project solutions for CPS assurance and certification at universities and other organizations.

In addition to the progress made, D8.7 presents an update of the dissemination and training plans.

D8.7 relates to the following AMASS deliverables:

- D8.1 (AMASS Website and Project Collaboration Platform) [3] provides details about the e-infrastructure of the project for communication and information exchange among AMASS partners, including the internal reporting of dissemination and training actions and results.
- D8.5 (Dissemination and Training Plan) [4] identifies needs and presents a plan regarding activities for the dissemination of project results and training.
- D8.6 (Dissemination and Training Progress (a)) [5] reported on the dissemination and training activities performed in the first year of the project.
- D8.8 (Dissemination and Training Progress (c)) will report on the activities performed in the third year.
- D9.1 (Project Management Plan and Handbook) [6] presents guidelines and rules about external communications and about how to use the project collaboration platform (e.g. file naming conventions and recommendations on the use of the project's mailing lists).

1. Introduction

AMASS will create and consolidate a de-facto Europe-wide assurance and certification open tool platform, ecosystem, and self-sustainable community spanning the largest CPS vertical markets. The ultimate aim is to lower certification costs in the face of rapidly changing product features and market needs. This will be achieved by establishing a novel holistic and reuse-oriented approach for architecture-driven assurance, multi-concern assurance (compliance demonstration, impact analysis, and compositional assurance of security and safety aspects), and for seamless interoperability between assurance and engineering activities along with third-party activities (external assessments, supplier assurance).

This document is deliverable D8.7 (Dissemination and Training Progress (b)), released by the AMASS WP8 (Exploitation, Dissemination and Standardization). The document describes the dissemination and training performed on the AMASS project between April 2017 and March 2018. More concretely, D8.7 presents the actions taken by the AMASS consortium to:

- Ensure the dissemination of knowledge gained during the project execution.
- Encourage new research and development in European industry that is intended to exploit results from AMASS.
- Provide training material and courses on AMASS technology and methods to industrial and other users.
- Set up a framework of bidirectional channels for input and recommendations to and from multiple industrial domains and wider research communities.

Dissemination and training play major roles in ARTEMIS and ECSEL. In ARTEMIS, the open innovation model (Figure 1; [8]) deals with aspects such as external relations, collaborative innovation, and education. The Strategic Research Agenda 2016 [9] emphasises the need to develop and exchange best practices in training and education for CPS, and there is an Education & Training Working Group [10]. The Multi-Annual Strategic Plans [11] in ECSEL explicitly refer to activities such as planning and organisation of dissemination events, the provision of education and training, and university education in close collaboration with the industry as key aspects for delivering the expected programme impact.

This document is organized as follows. Section 2 presents the dissemination progress and Section 3 the training progress. Section 4 presents our main conclusions. Finally, Appendix A and Appendix B summarise the progress of the dissemination and training plans, respectively.

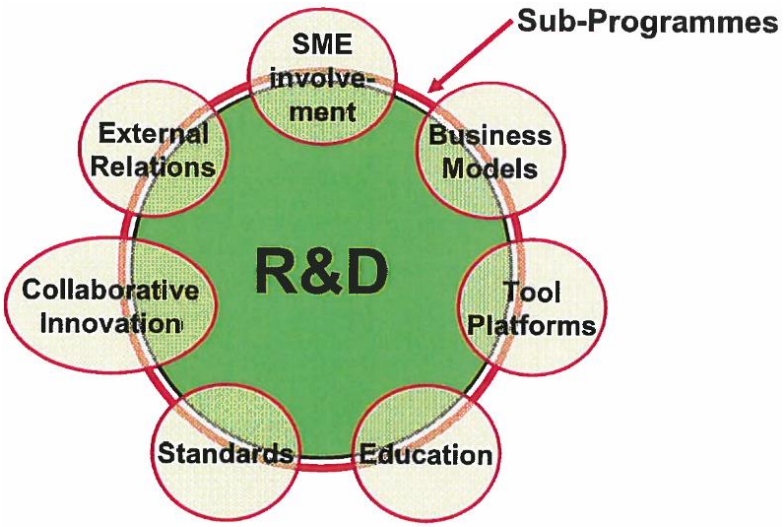


Figure 1. ARTEMIS open innovation model

2. Dissemination Progress

The dissemination activities performed in AMASS are divided into internal and external categories. In addition, communication activities have been performed. This section reports on the progress made in these three categories and presents an updated plan for general dissemination.

Table 1 presents the general objectives defined for dissemination in D8.5 [4] and their current result. As can be observed, the results for most metrics are already very close to the objectives for the whole project.

2.1 Internal Dissemination

AMASS has used different methods to share information among the project partners to effectively collaborate and reach the project goals. The main methods have been:

- Wiki
- SVN repository
- Mailing lists

These methods have been implemented using a project collaboration platform, which is described in the next section.

2.1.1 Project Collaboration Platform

The AMASS **wiki** (Figure 2) has continued to be used to provide a space where the project partners can easily find and share information fast. The partners have used it, for example, to organise the topics to discuss in the general meetings. In addition, the ticket system in the wiki is being used to report on improvements to the AMASS Tool Platform (Figure 3).

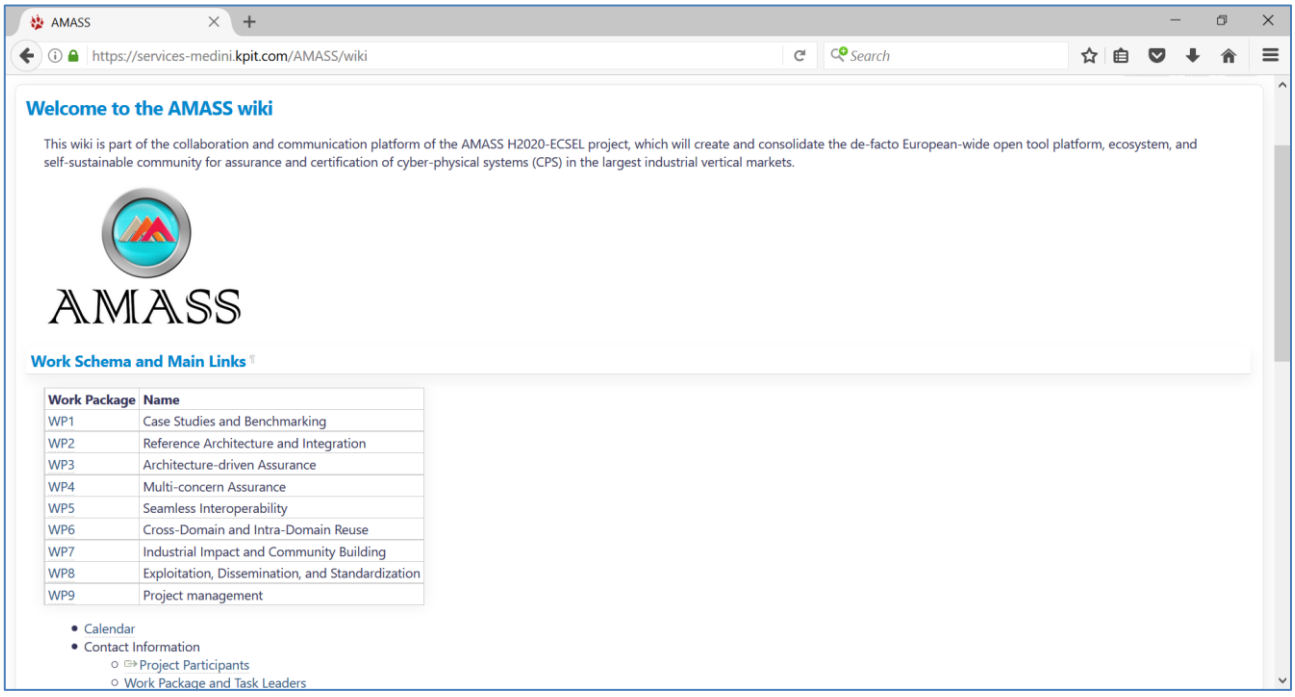


Figure 2. AMASS wiki

Table 1. General dissemination tools and channels

Dissemination tool/channel	How to measure	Objective for the whole project	Result until March 2018
Website	Monthly visits	100	8,000+ in total in 24 months (3,500+ between m01 and m12)
	Duration of visits	2 min on average	2:58 min on average
	Downloads per year	35 for posters, flyers and newsletters; 50 for public reports	• 1,603 downloads in total in 24 months (245 between m01 and m12); • 60 for the leaflet and 59 for the newsletters (26 and 10 between m01 and m12, respectively)
	References from external web pages	15 (excluding partners)	The search "*amass*" "*architecture-driven*" on Google returns over 2,000 entries (700 at m12), and "*www.amass-ecsel.eu*" over 700
Publications	Scientific papers at workshops	8	14 (7 between m01 and m12)
	Scientific papers at conferences	8	24 (7 between m01 and m12)
	Scientific articles	8	3 (2 between m01 and m12)
	Articles in industry magazines or stakeholder journals	8	1 (1 between m01 and m12)
Attendance to events	Posters presented at conferences	10	8 (3 between m01 and m12)
	Oral communications at conferences / events	20	41 (15 between m01 and m12)
	Flyers distributed	400	270 (150 between m01 and m12)
	Attended fairs	4	3 (1 between m01 and m12)
Organization of events	Workshops organized	3	10 (8 between m01 and m12)
	Registered people at workshops	>30	30+ on average
	Organized conferences	2	2 (0 between m01 and m12)
	Registered people at the conferences	100-150	Approx. 150 on average
	Flyers distributed	450	270 (150 between m01 and m12)

The **SVN repository** is the main tool that the AMASS partners use to share files. Figure 4 shows the repository structure. It contained over 1,300 folders and 10,900 files as of March 2018. Between m13 and m24, over 4,000 revisions have been committed. Another repository has been created for the AMASS Tool Platform source code.

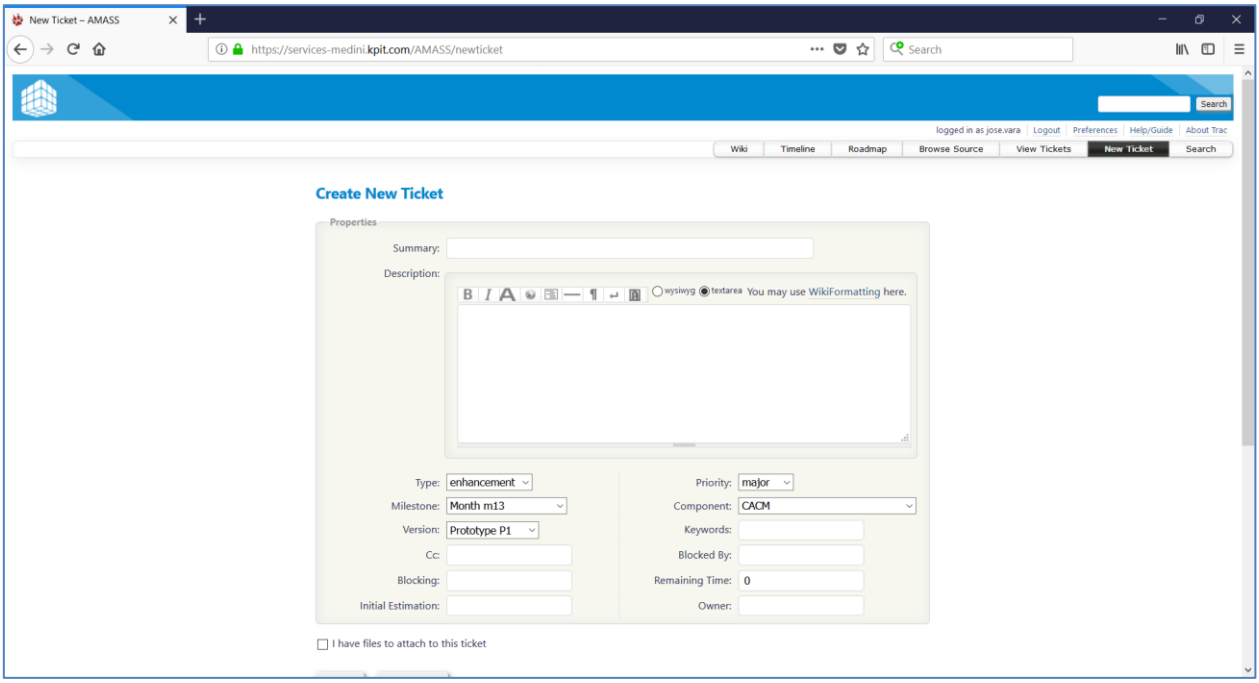


Figure 3. AMASS ticket system

The consortium uses 14 **mailing lists**. These are the main method used for internal communication. There is a general mailing list that all participants are subscribed to. This list aims to communicate project-wide information e.g. the organisation of general meetings. The other 13 mailing lists target specific topics e.g. specific WPs or AMASS bodies (Technical Committee, EAB, etc.). D8.1 [3] provides details about the lists. As of March 2, 2018, the AMASS consortium has exchanged over 5,000 emails through the lists.

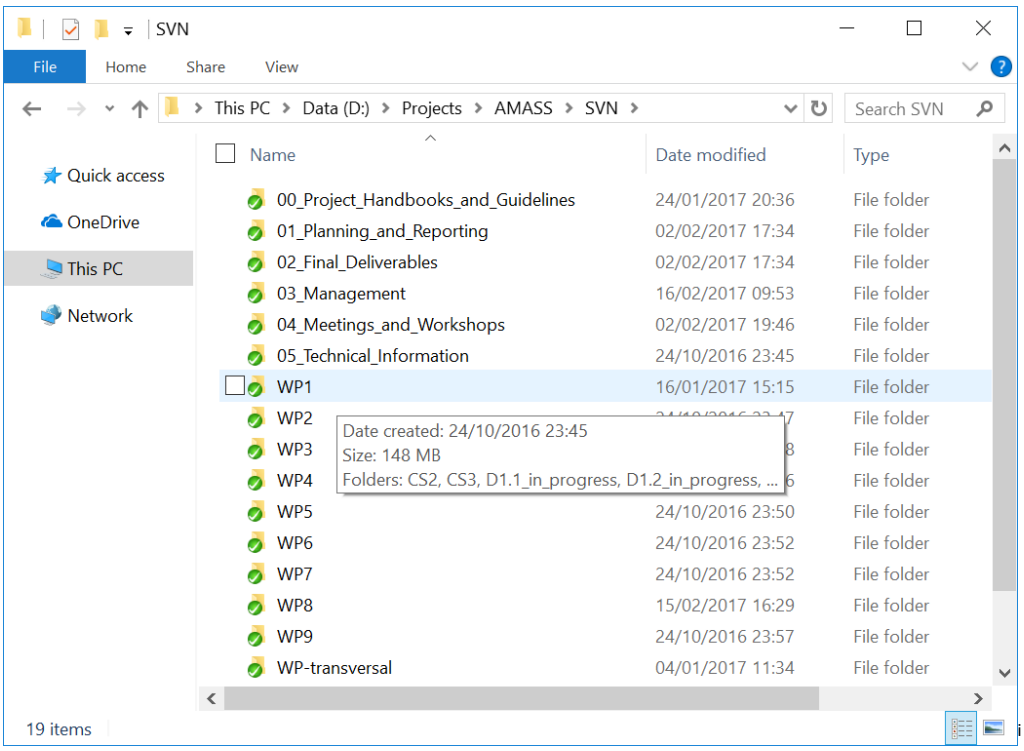


Figure 4. AMASS SVN repository

2.2 External Dissemination

External dissemination corresponds to activities that aim to reach specific third-party audiences, e.g. the research communities related to AMASS. The different methods used for external dissemination are presented in the following subsections. They include the preparation of materials for different dissemination channels (e.g. publications) as well as the participation in and organisation of events.

2.2.1 AMASS Website

The AMASS website (https://amass-ecsel.eu/) was created during the first year of the project including project presentations, publicly downloadable documents (project reports and dissemination papers), links to related projects, demonstration material, a blog section, etc. The website was designed to be a channel for dissemination, training, and discussion. The AMASS logo and website graphics promote the project in a unified graphical layout.

During the second year of AMASS, we have done the maintenance of the project website by updating existing sections and creating new ones.

The “Partners” section has been updated to reflect changes in several organization names and logos. The design of the “Deliverables” and “Dissemination” sections has been changed to align them with other web sections.

New content has been added to the “Events”, “Blog”, “Deliverables”, “Dissemination” and “Publications” sections:

- A total of 35 events related to the project between April 2017 and March 2018 (12 internal and 23 external) have been added to the project calendar in the “Events” section.
- At the moment of writing this report, 17 events planned after April 1st, 2018 (3 internal and 14 external) have been added to the project calendar in the “Events” section.
- A total of 15 blog posts have been created in the “Blog” section.
- 13 public deliverables, aside from this document, have been added to the “Deliverables” section.
- 2 Newsletters (April 2017 and October 2017) and a marketing video have been published in the “Dissemination” section.
- Links to 2017 and 2018 publications have been inserted in the "Publications” section.

Three new pages have been designed in the website to hold the following information:

- **External Advisory Board** (Figure 6): this section shows information about the EAB composition and the EAB workshops (attendees, agenda, presentations and report of conclusions).
- **Training** (Figure 7): this section gathers information and videos of the internal training sessions that have been organized so far in the project.
- **Demos** (Figure 8): this section shows video demos of the AMASS prototype.

The homepage of the AMASS website is shown in the Figure 5. At the moment of writing this report, the website comprises the following sections:

- Home
- Objectives
- Organization: External Advisory Board
- Partners
- Library: Deliverables, Dissemination, Publications, Training, and Demos
- Blog

- Events
- Contact Us

Fifteen blog posts have been published during the second year of the project [1]:

- 3rd AMASS General Meeting
- Very successful first project review for AMASS!
- Second semester of AMASS
- Recent AMASS participation in European events
- First workshop with EAB members
- The SASSUR 2017 workshop has been successfully held!
- 4th AMASS General Meeting
- AMASS presence at SAFECOMP 2017
- Third semester of AMASS
- Second Version of the AMASS Reference Tool Architecture
- AMASS youtube channel
- New AMASS training videos
- AMASS Prototype P1
- AMASS workshop on automotive case studies
- 5th AMASS General Meeting

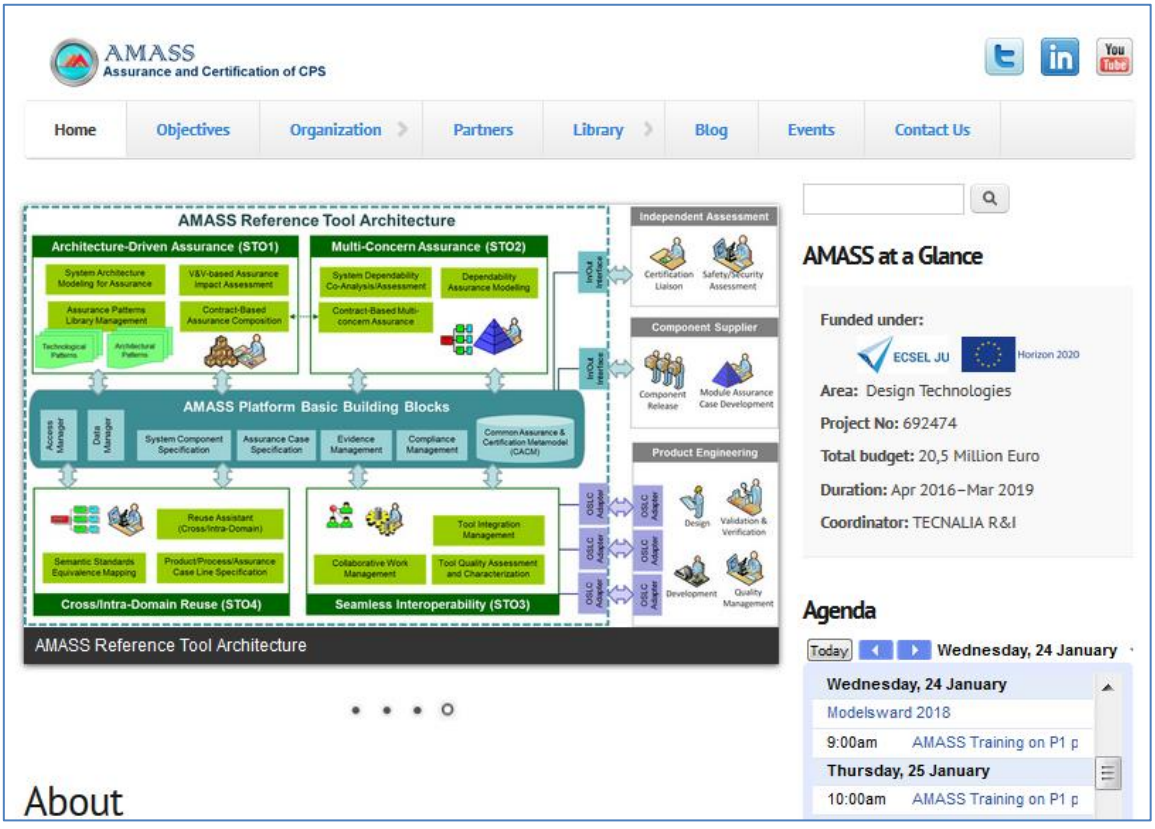


Figure 5. AMASS website

13 public deliverables have been published [2] aside from this document:

- D7.4 - AMASS open source platform marketing and outreach plan
- D1.4 - AMASS demonstrators (a)

- D7.5 - AMASS open source platform provisioning and website (a)
- D1.3 - Evaluation framework and quality metrics
- D3.5 - Prototype for architecture-driven assurance (b)
- D4.5 - Prototype for multi-concern assurance (b)
- D5.5 - Prototype for seamless interoperability (b)
- D6.5 - Prototype for cross/intra-domain reuse (b)
- D2.7 - Integrated AMASS platform (b)
- D3.3 - Design of the AMASS tools and methods for architecture-driven assurance (b)
- D7.6 - AMASS open source platform provisioning and website (b)
- D8.10 - Standardization Plan
- D8.3 - Exploitation Results and Initial Market Megatrends Analysis (b)

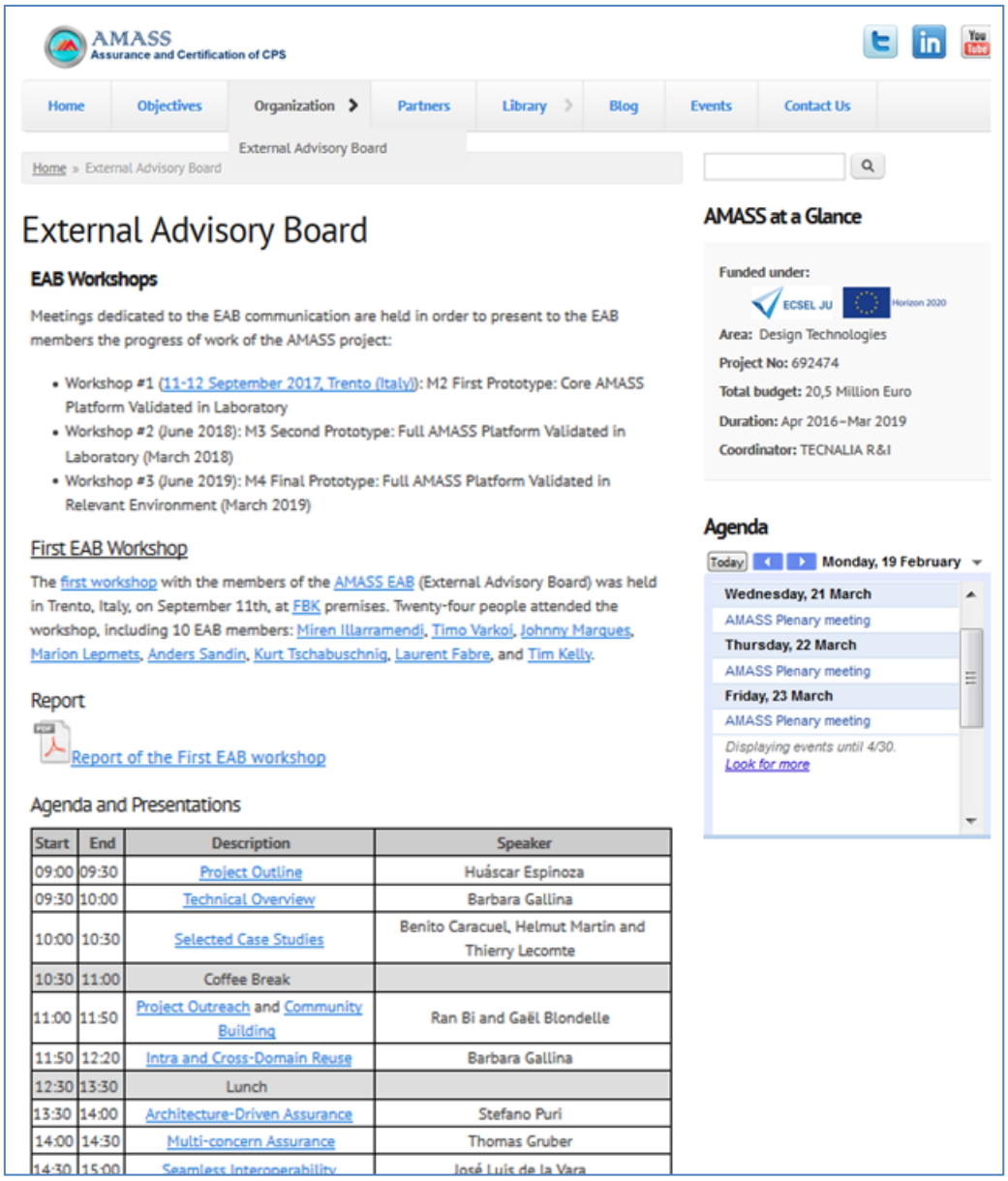


Figure 6. External Advisory Board section

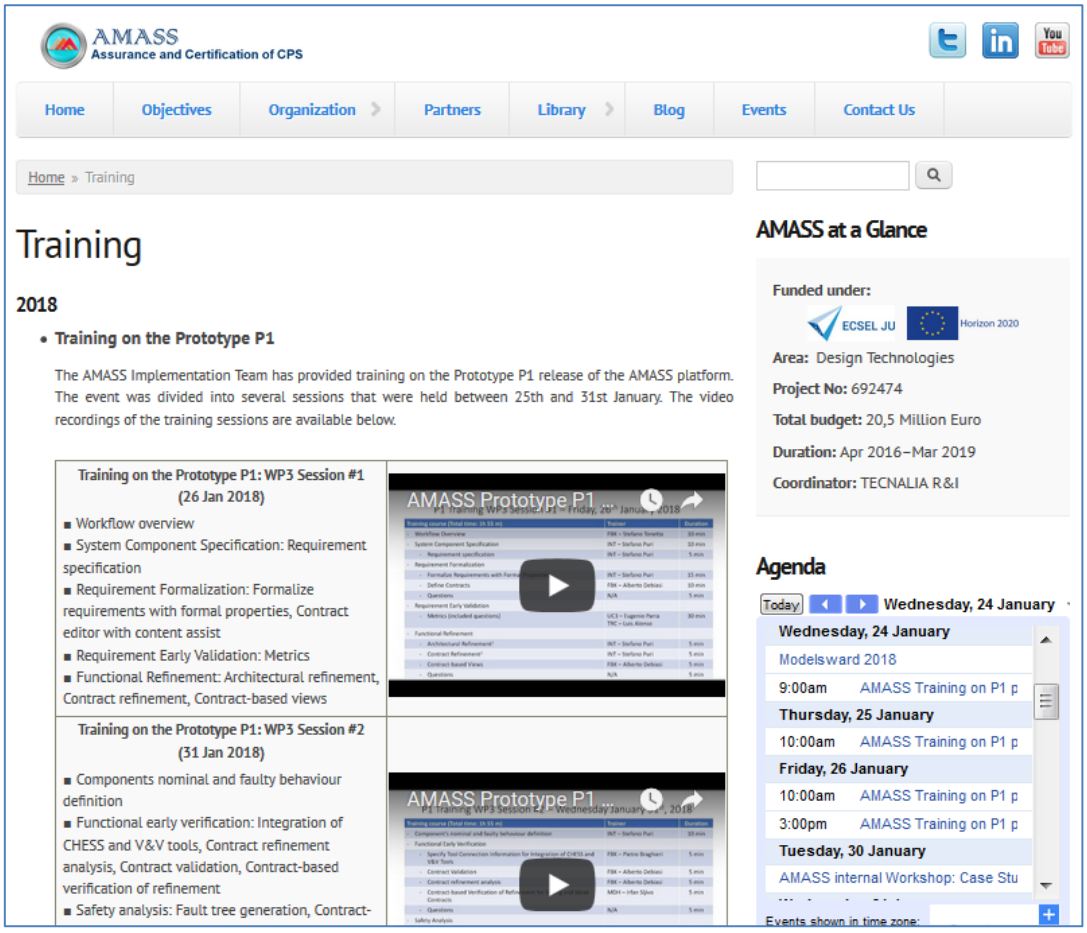


Figure 7. Training section

Figure 8. Demos section

The AMASS website is an efficient tool used to report progress made during the project. The number of visits to the AMASS website during its first 24 months (from April 1, 2016 to March 28, 2018) was close to 8,100. Further statistics are shown in Figure 9.

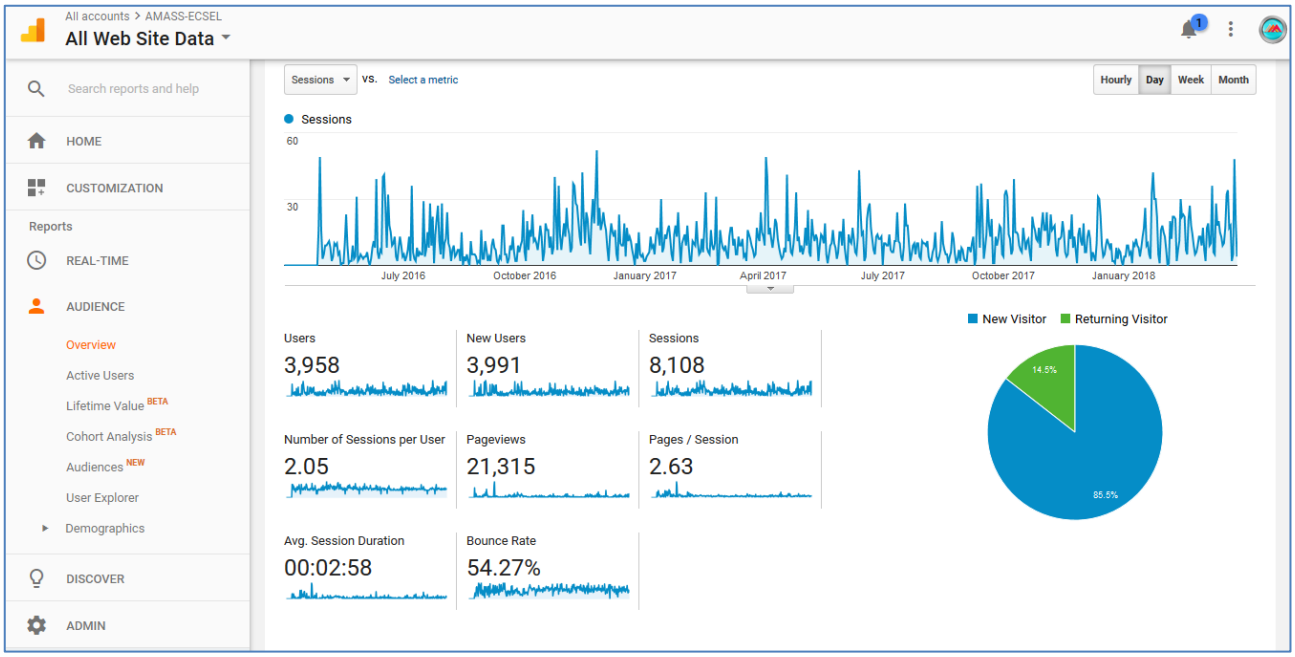


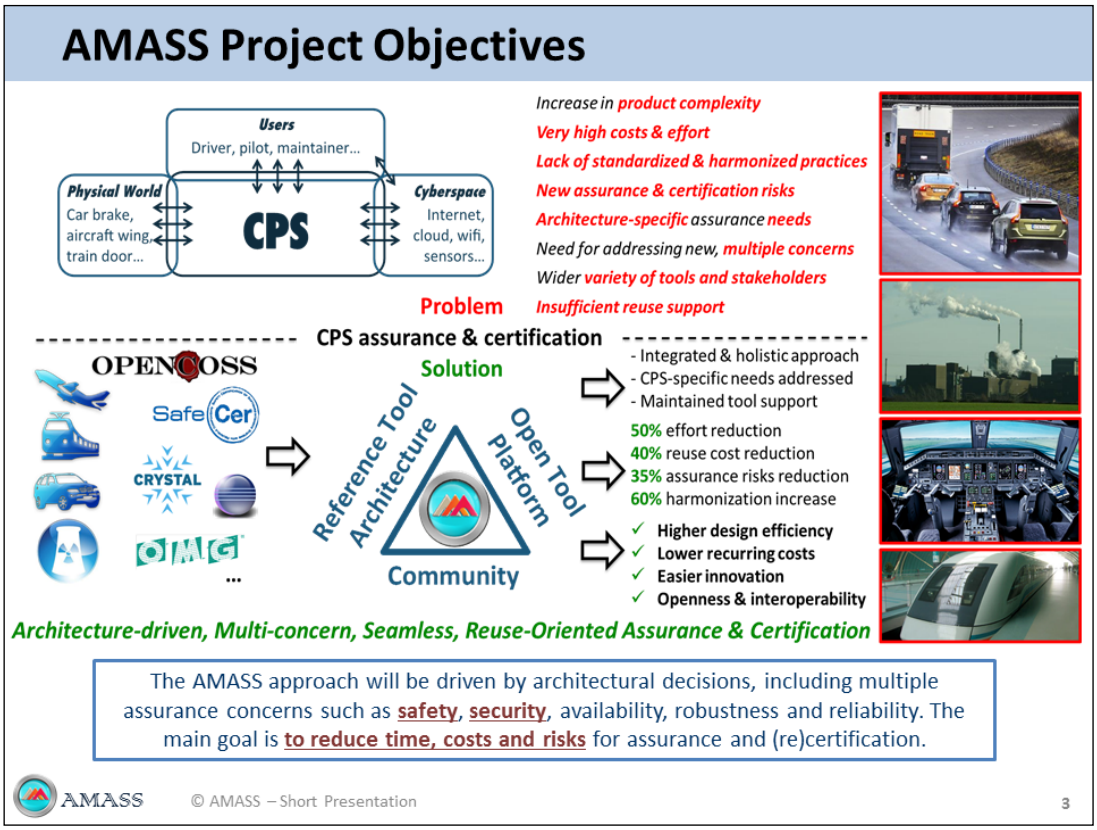
Figure 9. Statistics for the AMASS website

2.2.2 Dissemination Material

During the second year of the project, the AMASS consortium has maintained its dissemination materials. The main materials are:

- Project logo (see document front page)
- Project newsletter (see Section 2.3 for more details)
- Project presentations (Figure 10), a short (10-15 min.) and long version (around 30 min.)

ECSEL has prepared the official leaflet and poster of the project (Figure 11), in collaboration with AMASS partners. The partners have also continued using the leaflet (Figure 12 and Figure 13) and poster prepared initially by the consortium, as a complement to the official one (Figure 14). This material is available on the AMASS website, in the Dissemination section. The material has been used at the events that the AMASS partners have attended (see Section 2.2.6), e.g. the ECSEL Symposium 2017.



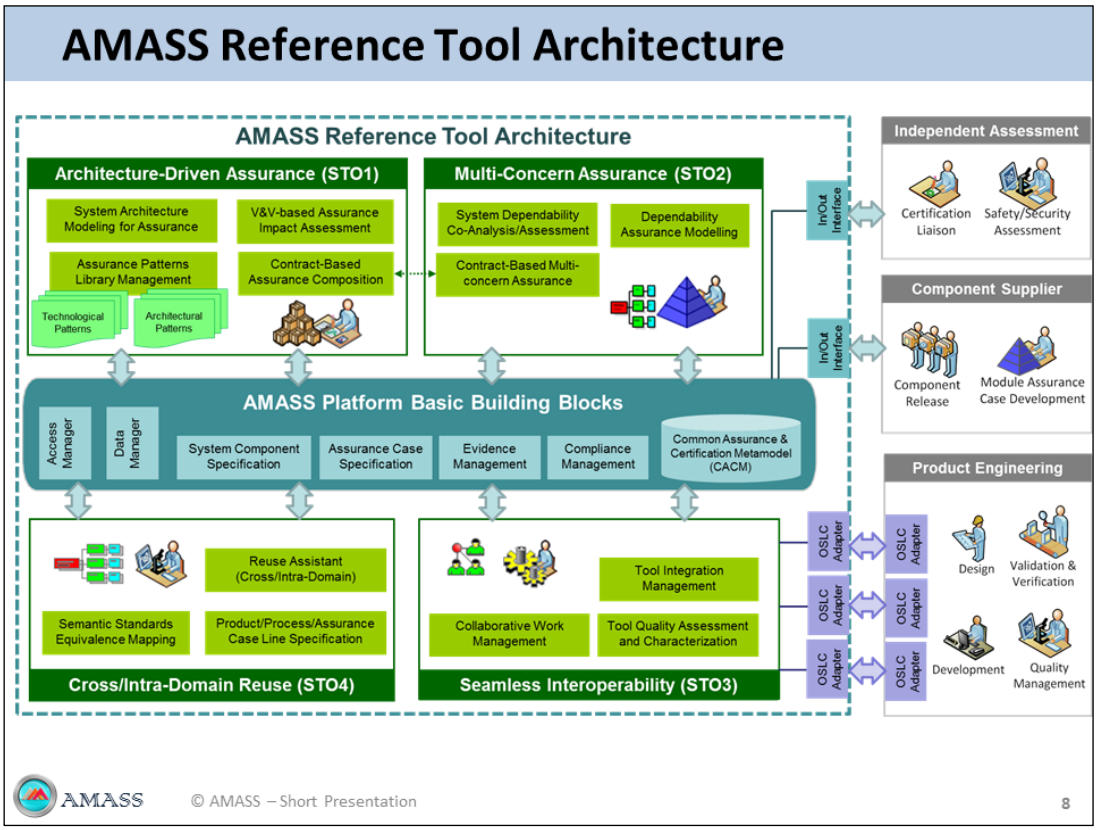


Figure 10. Examples of slides in the AMASS presentations

AMASS

ECSEL JU

Architecture-driven, Multi-concern and Seamless Assurance and Certification of Cyber-Physical Systems

Objectives

AMASS will create and consolidate the de-facto European-wide open tool platform, ecosystem, and self-sustainable community for assurance and certification of Cyber-Physical Systems (CPS). The ultimate goal of AMASS is to lower certification costs for CPS in face of rapidly changing features and market needs. The following main technical objectives have been defined:

- Define a holistic approach for architecture-driven assurance that directly and explicitly addresses current technologies and product architecture needs.
- Define a multi-concern assurance approach to ensure not only safety and security, but also other dependability aspects such as availability, robustness and reliability.
- Consolidate a cross-domain and intra-domain assurance reuse approach to improve mutual recognition agreement of compliance approvals.
- Develop a fully-fledged open tool platform that will allow developers and other stakeholders to guarantee seamless interoperability of the platform with other tools used in CPS development.

Relevance and Impact

The AMASS consortium consists of partners with wide experience in critical system assurance and certification, covering its whole value chain:

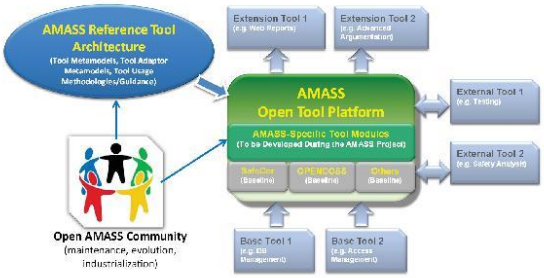
- OEMs (including system integrators) and Component suppliers will use AMASS results to increase CPS design cost-effectiveness, ease innovation, and reduce the costs and risks of assurance.
- Assessors and Certification authorities will be able to provide CPS-specific services.
- Tool vendors will extend their products with new features and integrate them with the AMASS Platform.
- Research partners will be able to reach a leading position in research on CPS assurance and certification by contributing to top-notched, flagship solutions.

In addition, European society will benefit from the use of CPS with a higher confidence in their dependability, for a wide range of applications in transport, manufacturing, healthcare, energy, defence, and communications.

Technical Innovation

The main tangible results of the projects will be:

- AMASS Reference Tool Architecture, which will extend prior conceptual and methodological frameworks for architecture-driven and multi-concern assurance, as well as for reuse and seamless interoperability.
- AMASS Open Tool Platform, which will correspond to an open collaborative tool environment that supports CPS assurance and certification. It is a concrete implementation of the Reference Tool Architecture.
- Open AMASS Community, which will manage the project outcomes, for maintenance, evolution and industrialization. The Open Community will be supported by a governance board, rules, policies, and quality models.



The results will ultimately allow AMASS to demonstrate:

- Gain for design efficiency of complex CPS by reducing their assurance and certification effort.
- Reuse of assurance results, leading to cost reductions for (re)certification.
- Raise of technology innovation led by reduction of assurance and certification risks of CPS products.
- Sustainable impact in CPS industry by increasing the harmonization and interoperability of assurance and certification support technologies.

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ECLIPSE FOUNDATION EUROPE
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France
ALLIANCE POUR LES TECHNOLOGIES DE L INFORMATIQUE
ALSTOM TRANSPORT S.A.
COMMISARIAT A L ENERGIE ATOMIQUE ET AUX ENERGIES ALTERNATIVES
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AMASS

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Start 1-4-2016
Duration 36
Total investment €M 20.5
Participating organisations 29
Number of countries 8

Figure 11. Official AMASS leaflet and poster

AMASS

Architecture-driven, Multi-concern and Seamless Assurance and Certification of Cyber-Physical Systems

AMASS will create and consolidate the **de-facto European-wide open tool platform, ecosystem, and self-sustainable community for assurance and certification of Cyber-Physical Systems** (CPS) in the largest industrial vertical markets including automotive, railway, aerospace, space, and energy.

The ultimate goal of AMASS is to **lower certification costs** for CPS in face of rapidly changing features and market needs. This will be achieved by establishing **a novel holistic and reuse-oriented approach for architecture-driven assurance** (fully compatible with standards such as AUTOSAR and IMA), **multi-concern assurance** (for co-analysis and co-assurance of e.g. security and safety aspects), **and seamless interoperability** between assurance and engineering activities along with third-party activities (e.g. external assessments and supplier assurance).

AMASS work will build on the **results from previous successful EU projects** such as OPENCOSS, SafeCer, CRYSTAL, CHESS, and SESAMO.

Key data
Apr 2016 - Mar 2019
29 partners from 8 countries
EUR 20.5M budget
EUR 6.2M EU funding
EUR 4.2M national funding
Approx. 2500 persons/month

Web: http://amass-ecsel.eu/
Twitter: @AMASSproject

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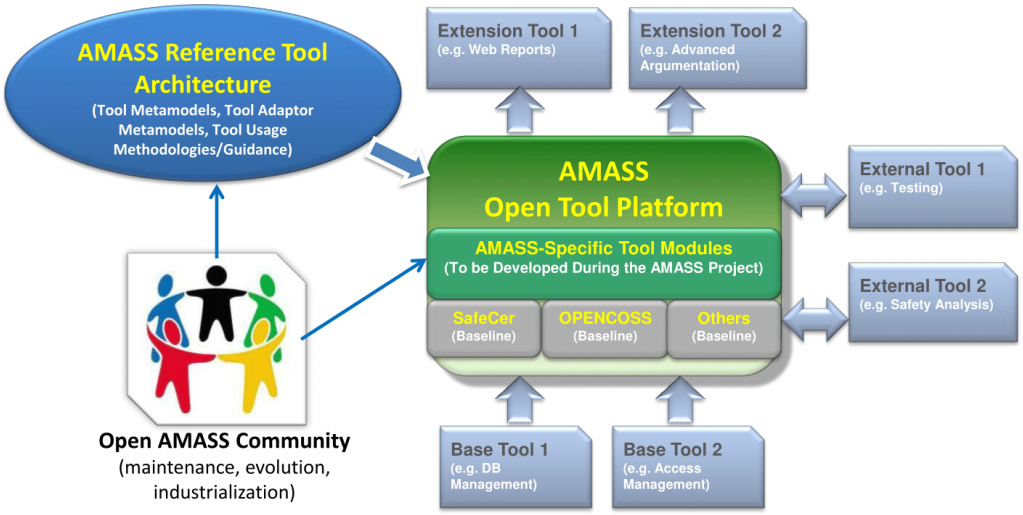


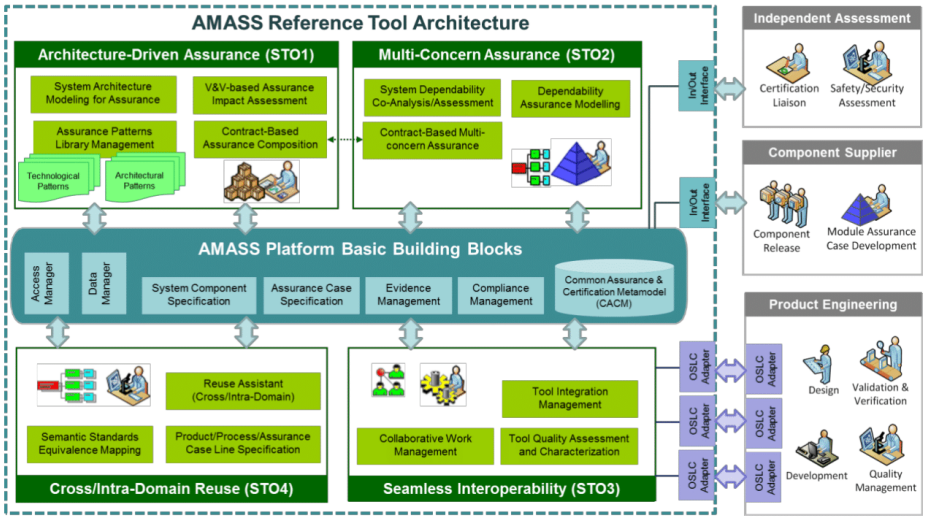
ECSEL Joint Undertaking

European Commission

H2020-ECSEL-2015
Research and Innovation Action
Grant agreement no. 692474

Figure 12. Front of the project leaflet prepared by the AMASS consortium

Envisioned Technological Solution



Goals

1. A potential gain for **design efficiency** of complex CPS by reducing their assurance and certification/qualification effort by 50%;
2. A potential reuse of assurance results (qualified or certified before), leading to 40% of **cost reductions** for component/product (re)certification/qualification activities;
3. A potential raise of **technology innovation** led by 35% reduction of assurance and certification risks of new CPS products, and;
4. A potential sustainable impact in CPS industry by increasing the **harmonization and interoperability** of assurance and certification/qualification tool technologies by 60%.

AMASS results will be validated and their benefits will be evaluated in 11 case studies from Air Traffic Management, Automotive, Avionics, Industrial automation, Railway, and Space.

Impact

- **OEMs** (including system integrators) **and Component suppliers** will use AMASS results in order to increase CPS design cost-effectiveness, ease innovation, and reduce the costs and risks of CPS assurance and certification
- **Assessors and Certification authorities** will be able to provide services that better fit CPS-specific needs
- **Tool vendors** will extend their products with new features and integrate them with the AMASS Open Tool Platform, further benefiting from the openness and interoperability that AMASS will enable
- **European society** will benefit from the use of CPS with a higher confidence in their dependability, for a wide range of applications in transport, manufacturing, healthcare, energy, defence, and communications.

Project partners

Tecnalia R&I (ES)
Honeywell (CZ)
Schneider Electric España (ES)
KPIT medini Technologies (DE)
Mälardalen University (SE)
Eclipse Foundation Europe (DE)
Infineon (DE)
Austrian Inst. of Technology (AT)
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The REUSE company (ES)
OHB (SE)
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AVL List (AT)
Virtual Vehicle (AT)
ALL4TEC (FR)
CEA List (FR)
ClearSy (FR)
Alten (SE)
Lange Aviation (DE)
Thales (IT)
SP Sveriges Tekniska Forskn. (SE)
Comentor (SE)

Figure 13. Back of the project leaflet prepared by the AMASS consortium

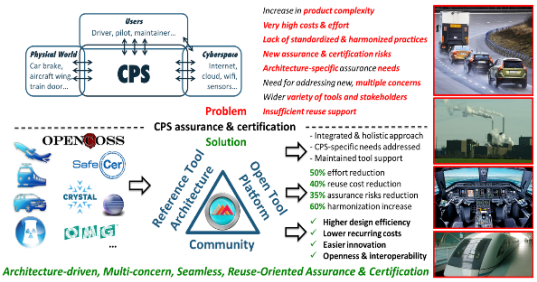
AMASS

Architecture-driven, Multi-concern and Seamless Assurance and Certification of Cyber-Physical Systems

1 Project Objectives

AMASS will create and consolidate the European-wide **open tool platform, ecosystem, and self-sustainable community for assurance and certification of Cyber-Physical Systems** (CPS). The ultimate goal of AMASS is to lower certification costs for CPS in face of rapidly changing features and market needs. The project will:

- Define a holistic approach for **architecture-driven assurance** that addresses current technologies and product architecture needs.
- Define a **multi-concern assurance** approach to ensure not only safety and security, but also other dependability aspects.
- Consolidate a **cross-domain and intra-domain assurance reuse** approach to improve mutual recognition of compliance approvals.
- Develop a fully-fledged open tool platform that will allow developers and other stakeholders to guarantee **seamless interoperability** of the platform with other tools used in CPS development.



2 Technical Innovation

The main tangible results of the projects will be:

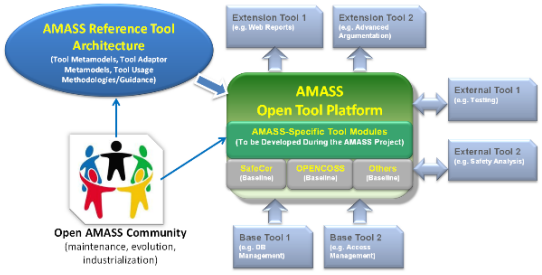
1. AMASS Reference Tool Architecture, which will extend prior conceptual and methodological frameworks for architecture-driven and multi-concern assurance, as well as for reuse and seamless interoperability.

2.AMASS Open Tool Platform, which will correspond to an open collaborative tool environment that supports CPS assurance and certification. It is a concrete implementation of the Reference Tool Architecture.

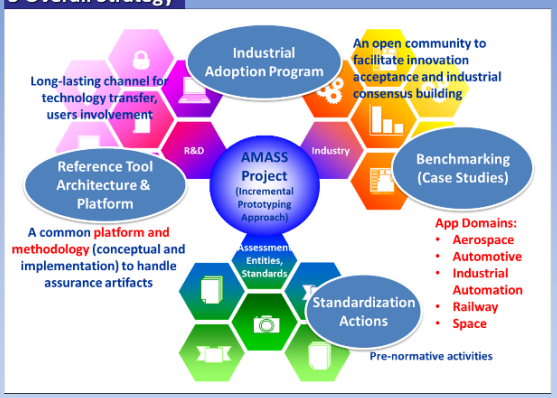
3.Open AMASS Community, which will manage the project outcomes, for maintenance, evolution, and industrialization. The Open Community will be supported by a governance board, rules, policies, and quality models.

The results will ultimately allow AMASS to demonstrate:

- Gain for **design efficiency** of complex CPS by reducing their assurance and certification effort.
- Reuse of assurance results, leading to **cost reductions** for (re)certification.
- Raise of technology innovation led by **reduction of assurance and certification risks** of CPS products.
- Sustainable impact in CPS industry by increasing the **harmonization and interoperability** of assurance and certification support technologies.

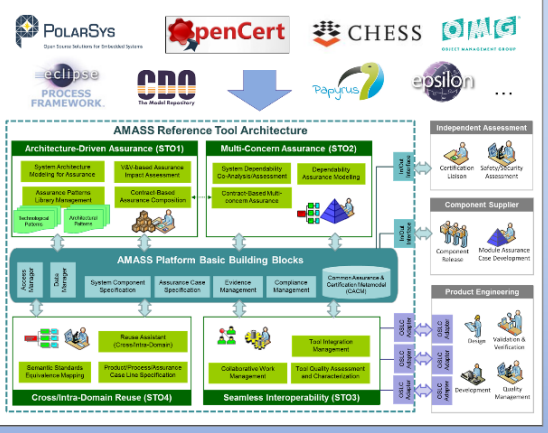


3 Overall Strategy



4 Technological Solution

A **model-based approach and tool support** for CPS assurance and certification in the largest industrial vertical markets, including automotive, railway, aerospace, space, and energy domains



AMASS in a Nutshell

H2020-ECSEL-2015 Research & Innov. Action - Grant agreement no. 692474

Apr 16 - Mar 19

29 partners

8 countries

20.7M€ budget

~2500 pm effort

http://amass-ecsel.eu/ @AMASSproject

Figure 14. Project poster prepared by the AMASS consortium

2.2.3 Social Media Activity

AMASS has been active on two social media platforms: Twitter (Figure 15) and LinkedIn (Figure 16). As of March 27, 2018, the Twitter account has 123 followers (41 more than in March 2017) and the LinkedIn group has 270 members (15 more than in March 2017). During the second project year, AMASS has published 39 project-specific tweets and started 12 discussions on the group.

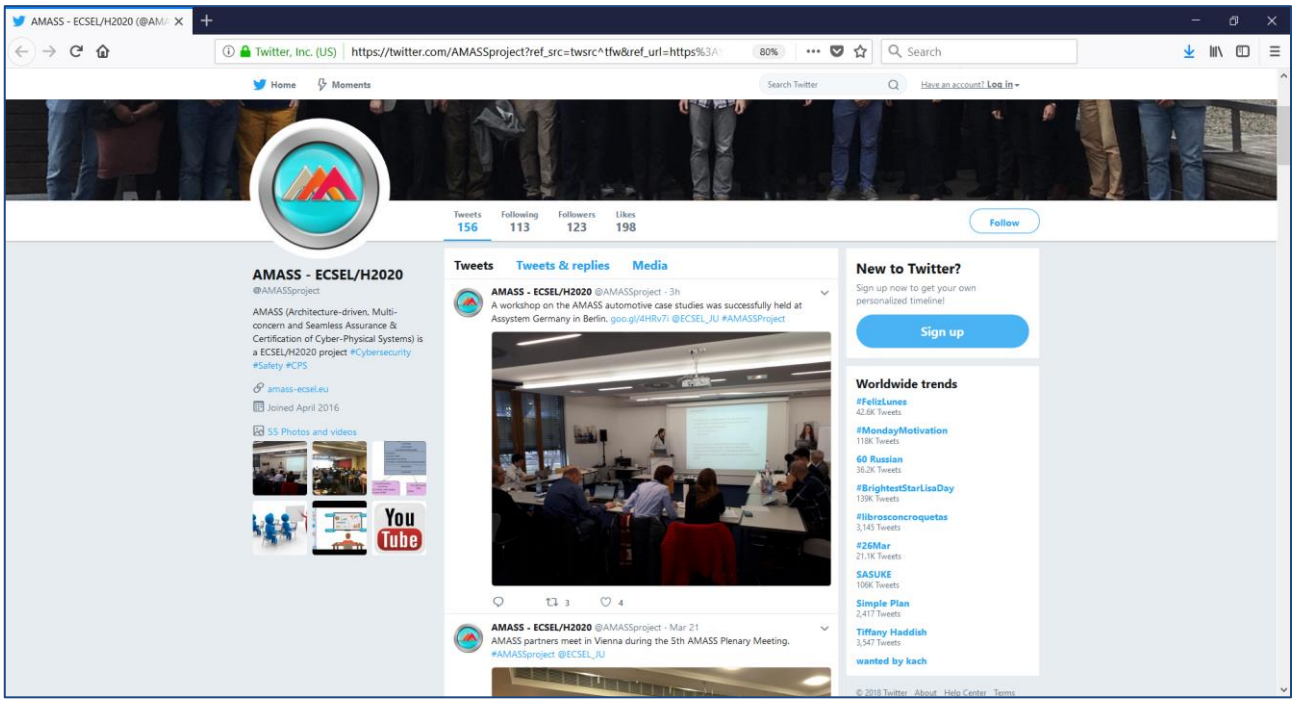


Figure 15. AMASS Twitter account

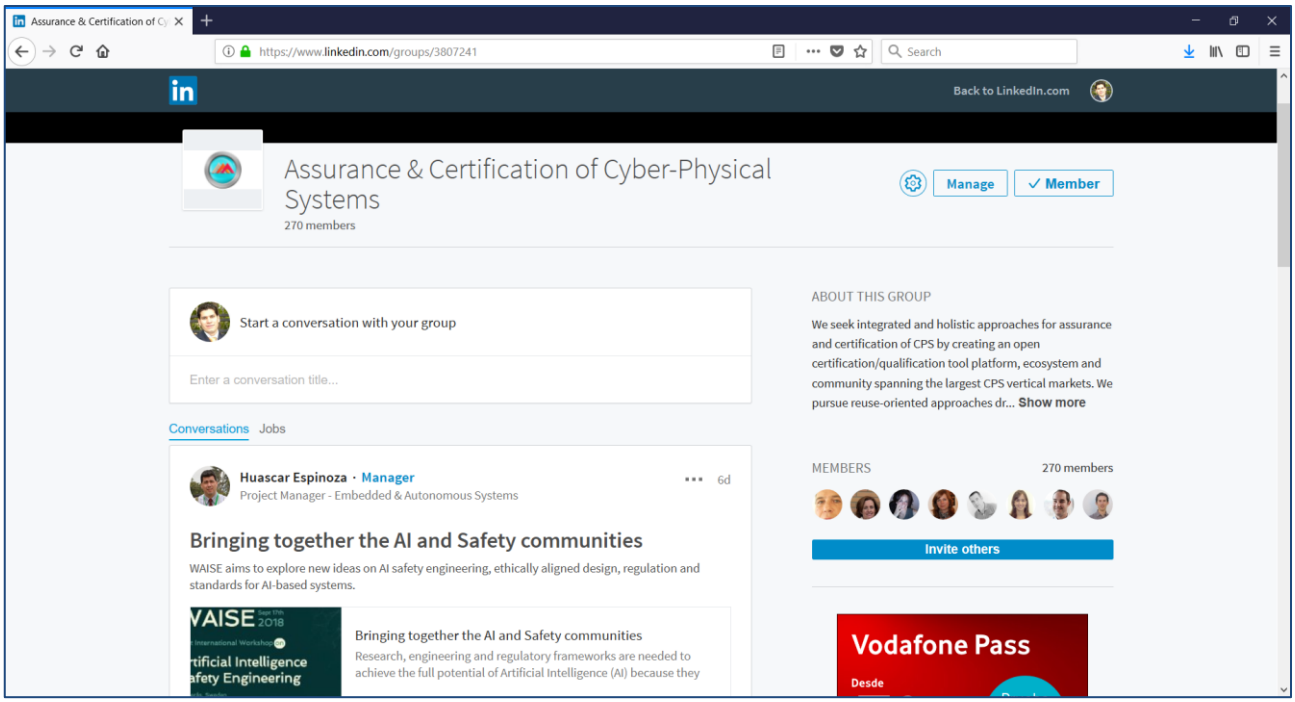


Figure 16. LinkedIn group managed by AMASS

2.2.4 YouTube Channel

A YouTube channel (Figure 17) with videos about the results of AMASS and about the technologies used for their development has been created in December 2017:

https://www.youtube.com/channel/UCw_D0l5sDgysEphi6tzzDyw

An icon with a link to the YouTube channel has been added in at the header section of the website (Figure 5), close to the Twitter and LinkedIn icons. The channel currently includes a marketing video, a demo of the Core Prototype and videos of the past training sessions. Links to the videos are also available on the AMASS website in the Training section (Figure 7) and Demos section (Figure 8).

Currently, the channel has 33 subscriptions. The most popular video with 177 views is the Marketing video.

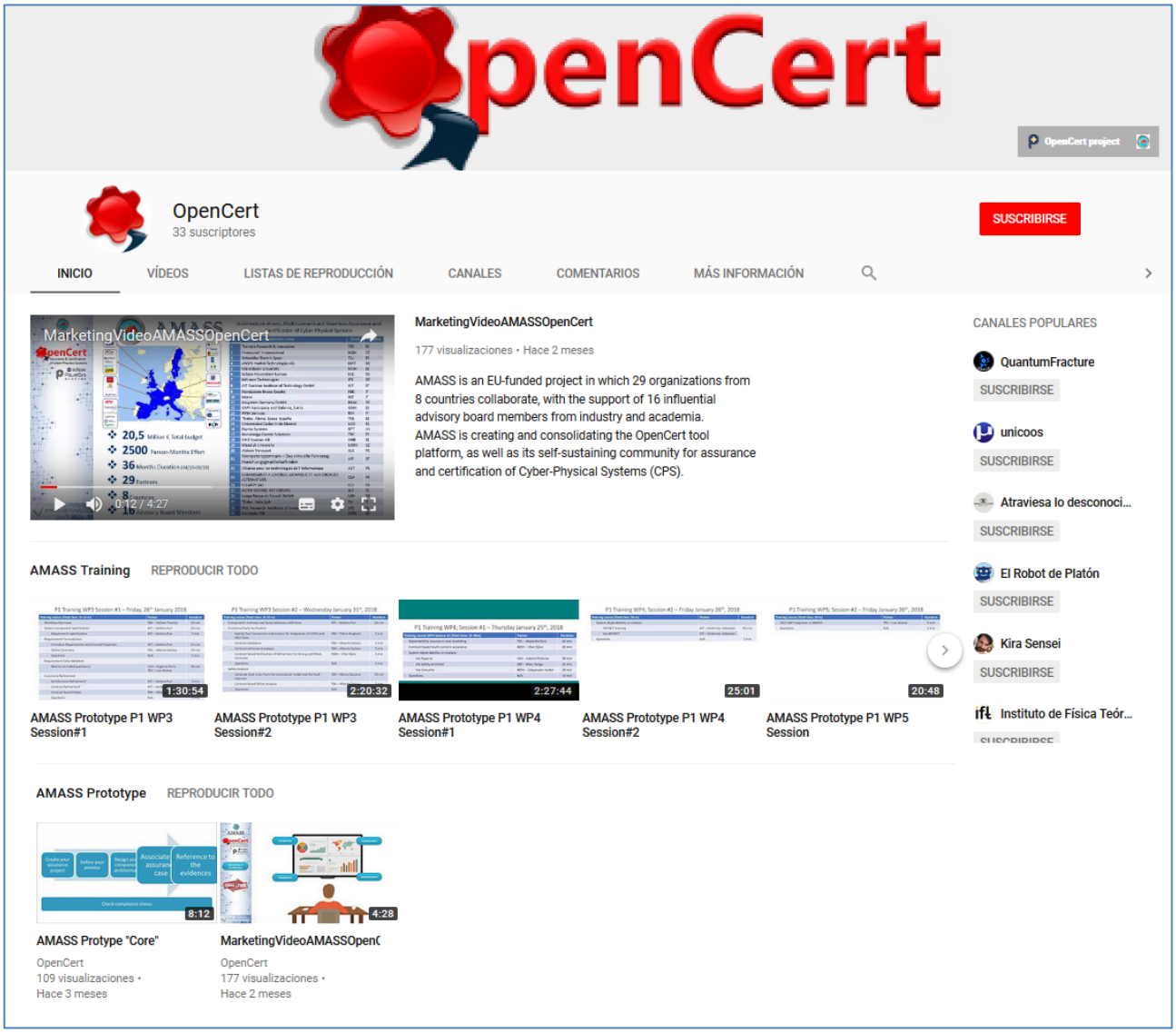


Figure 17. AMASS YouTube channel

2.2.5 Event Organization

The AMASS consortium has been very active in the organisation of events related to the assurance and certification of CPS. The main events are described in the subsections below.

2.2.5.1 SASSUR 2017

SASSUR 2017 (http://safecomp17.fbk.eu/workshops/sassur_program), the 6th International Workshop on Next Generation of System Assurance Approaches for Safety-Critical Systems, was held on September 12, 2017, in Trento, Italy, as a SAFECOMP 2017 workshop. SASSUR is one of the key events for scientific dissemination in AMASS, and the project supported the organisation of the workshop.

The SASSUR workshop is intended to explore new ideas to improve system assurance and certification of safety-critical systems. In particular, SASSUR provides a forum for thematic presentations and in-depth discussions about the alignment of standards and system characteristics, specification of assurance cases, safety evidence management, and reuse of assurance information in a way that makes assurance and certification more cost-effective, precise, and scalable. The workshop proceedings are published on Springer and available at: https://link.springer.com/book/10.1007%2F978-3-319-66284-8.

Over 25 people attended the workshop, including people from academia and from industry. Among the AMASS partners, Alejandra Ruiz (TEC) and Jose Luis de la Vara (UC3) participated in the workshop as co-organisers, and Helmut Martin (VIF) and Irfan Sljivo (MDH) presented a paper each.

The keynote speaker was Johnny Marques, Principal Product Development Engineer and responsible for Software Quality Assurance at Embraer (Figure 18). Embraer produces commercial, military, executive and agricultural aircrafts and provides aeronautical services. Johnny presented a set of metrics to assess and monitor compliance with RTCA DO-178C, explaining how they have been developed and how they are used at Embraer.

SASSUR papers were divided into three main general areas: safety standards, safety & cybersecurity engineering, and runtime assessment. The main topics of the accepted papers are compliance management with ontologies, extension of safety standards with cybersecurity aspects, safety and security co-engineering, extension of safety standard practices for supplier selection, runtime risk assessment, and degradation cascades of car platoons.

A panel on assurance of safety and security was also organised. Laurent Fabre, Marion Lepmets, and Johnny Marques were the panellists, and Tim Kelly was the moderator. They all are members of AMASS EAB. Among the main aspects discussed, the participants referred to challenges and needs for joint education on safety and security, for assurance processes combination, integration, and harmonisation, and for the generation of more knowledge.

2.2.5.2 SAFECOMP 2017

In addition to SASSUR 2017, AMASS partners organised and participated in other SAFECOMP events (http://safecomp17.fbk.eu/).

SAFECOMP 2017 was organized by the AMASS partners Erwin Schoitsch (AIT) and Stefano Tonetta (FBK). Many other AMASS partners participated in the conference, including B&M, CEA, MDH, ViF, and TEC. The conference was co-located with four workshops, including SASSUR and DECSoS (organized by AIT; co-chair Erwin Schoitsch), and with the 5th International Symposium on Model Based Safety Assessment (IMBSA 2017) organized by FBK (co-chair Marco Bozzano). Barbara Gallina (MDH) was the chair of the “Safety and Security” session at the main conference, which hosted interesting discussions on co-engineering of safety and security. She also presented the EWICS-SEC sub-group and its current agenda during the session dedicated to EWICS.

Figure 18. Presentation at SASSUR 2017

The conference was a great opportunity to present the progress of the AMASS project in front of an international audience with more than 150 participants coming from 22 different countries. The list of presentations by AMASS partners is as follows.

At SAFECOMP:

- Arguing on Software-Level Verification Techniques Appropriateness, by Carmen Carlan, Barbara Gallina, Severin Kacianka and Ruth Breu.
- A Strategy for Assessing Safe Use of Sensors in Autonomous Road Vehicles, by Rolf Johansson, Samieh Alissa, Staffan Bengtsson, Carl Bergenhem, Olof Bridal, Anders Cassel, De-Jiu Chen, Martin Gassilewski, Jonas Nilsson, Anders Sandberg, Stig Ursing, Fredrik Warg and Anders Werneman.
- Early Safety Assessment of Automotive Systems Using Sabotage Simulation-Based Fault Injection Framework, by Garazi Juez, Estibaliz Amparan, Ray Lattarulo, Alejandra Ruiz, Joshue Perez and Huascar Espinoza.
- Systematic Pattern Approach for Safety and Security Co-Engineering in the Automotive Domain, by Tiago Amorim, Helmut Martin, Zhendong Ma, Christoph Schmittner, Daniel Schneider, Georg Macher, Bernhard Winkler, Martin Krammer and Christian Kreiner.

At SASSUR:

- Representation of Safety Standards with Semantic Technologies Used in Industrial Environments, by Jose Luis de La Vara, Álvaro Gómez, Elena Gallego, Gonzalo Génova and Anabel Fraga.

Feedback: Discussions about the validity and the validation of the results that a quality analysis tool can provide on an assurance standard and on compliance, about the process to create ontologies of safety standards, and about the real need for removing ambiguity from standards.

- Safety and Security Co-Engineering and Argumentation Framework, by Helmut Martin, Robert Bramberger, Christoph Schmittner, Zhendong Ma, Thomas Gruber, Alejandra Ruiz and Georg Macher.

  Feedback: The main discussion points were: (1) Good systematic approach to combine safety and security aspects; (2) STPA-Sec interesting Co-Engineering approach also for other domains; and (3) Tool support for analysis of standards can be improved.

- Assuring Degradation Cascades of Car Platoons via Contracts, by Irfan Sljivo, Barbara Gallina and Bernhard Kaiser.

  Feedback: The main discussion points were: (1) How to handle the number of failure combinations that need to be considered in the Systems of Systems scenario; (2) Is it sufficient to consider only failure logic behaviour to be able to assure safety?; and (3) Does automation of safety argumentation negatively influence the overall confidence in the system safety case?

At TELERISE:

- Security and Privacy in the Automotive domain: a Technical and Social Analysis, by Zhendong Ma, Walter Seböck, Bettina Pospisil, Christoph Schmittner and Thomas Gruber.

Figure 19. Presentation at SAFECOMP 2017

At IMBSA:

- Timed Failure Propagation Analysis for Spacecraft Engineering: The ESA Solar Orbiter Case Study, by Benjamin Bittner, Marco Bozzano and Alessandro Cimatti.
- SafeConcert: a Metamodel for a Concerted Safety Modelling of Socio-Technical Systems, by Leonardo Montecchi and Barbara Gallina.

  Feedback: The conceptual metamodel presented raised interest. Concerning the socio-technical aspects, some participants in the audience were interested in understanding to which extent we exploited it and if we could overcome confidentiality-barriers.

In summary, SAFECOMP 2017 has been a great opportunity for AMASS to disseminate the project vision and results. AMASS partners are looking forward to SAFECOMP 2018 to repeat the large and successful participation.

2.2.6 Event Participation

In addition to those organised by the partners, the AMASS consortium has participated in the following **27 events**:

- **DIF 2017** - Digital Innovation Forum. Amsterdam, Netherlands. May 10-11, 2017.
- **EclipseCon Europe 2017**. Ludwigsburg, Germany. October 24-26, 2017

  Feedback: Great interest in the development of an open source solution for assurance and certification.
- **EclipseCon France 2017**. Toulouse, France. June 21-22, 2017.

  Feedback: Great interest in the development of an open source solution for assurance and certification.
- **ECSEL Symposium 2017**. Malta. June 13-14, 2017.

  Feedback: The attendees asked about the role of testing in AMASS, the integration of testing tools with the AMASS Platform, the collaboration of industrial and academic partners, and the application of AMASS results to specific systems.
- **ER 2017** - 36th International Conference on Conceptual Modelling. Valencia, Spain. November 6-9, 2017

  Feedback: The feedback received focused on: the possibility of performing different tasks in experiments, the measures taken in experiment design for relevant selection of fragments of standards, and the implications of using students as subjects.
- **EuroAsiaSPI 2017** - 24th European Conference on Systems and Software Process and Product Improvement and Innovation. Ostrava, Czech Republic. September 5-8, 2017.

  Feedback: The attendees reported that: (1) the use of formal methods for compliance checking is interesting; however, they are difficult to apply, since the users are not used to formal methods and they require special skills; and (2) the comparisons done between standards that have different concerns have to be carefully done, since their purposes are different and it can be overestimated.
- **FMEA Workshop**. Deutschlandsberg, Austria. April 27-28, 2017.
- **GARTEUR workshop**. Rome, Italy. September 14, 2017.

  Feedback: Positive feedback was received, in particular regarding the model-based approach for assurance and certification.
- **ICSE 2017** - 39th International Conference on Software Engineering. Buenos Aires, Argentina. May 20-28, 2017.

Feedback: Interest in the safety implications of system changes and in the specification and change impact analysis of safety cases.

- **ICRE 2017** - 2nd International Conference on Reliability Engineering. Milan, Italy. December 20-22, 2017.
  Feedback: The audience was quite heterogeneous. The presentation was appreciated. A certificate for best presentation of the session was given to the presenter (Barbara Gallina).
- **ICVES 2017** - IEEE International Conference on Vehicular Electronics and Safety. Vienna, Austria. June 27-28, 2017.
- **ISSTA 2017** - ACM SIGSOFT International Symposium on Software Testing and Analysis. Santa Barbara, US. July 9-13, 2017.
- **INCOSE IS 2017** - 27th Annual INCOSE International Symposium. Adelaide, Australia. July 15-20, 2017.
  Feedback: The solutions that TRC is developing in AMASS (e.g. quality analysis and evolution, tool integration, ontology configuration management) raised a great interest.
- **IWES 2017** - 2nd Italian Workshop on Embedded Systems. Rome, Italy. September 7-8, 2017.
- **MODELSWARD 2018** - 6th International Conference on Model-Driven Engineering and Software Development. Madeira, Portugal. January 22-24, 2018.
  Feedback: The audience asked about the process for reaching a consensus upon metamodels, the need for defining core teams of contributors for metamodel development and decision making, the challenges for technology adoption, the issues with cross-domain acceptance, result sustainability, and the impact of different safety cultures among companies and application domains.
- **PESI day of the Safety Working Group**. Madrid, Spain. March 21, 2017.
  Feedback: Questions about the application of AMASS results for emergent applications in emerging domains such as Industry 4.0 and Internet of Things.
- **RE 2017** - 25th IEEE International Requirements Engineering Conference. Lisbon, Portugal. September 4-8, 2017.
  Feedback: Great interest in the requirements-targeted solutions that TRC is developing in AMASS.
- **5th Scandinavian Conference on System & Software Safety**. Stockholm, Sweden. May 23, 2017.
  Feedback: The presentation raised interest. A researcher involved in the NOR-STA platform (http://www.nor-sta.eu/en) expressed interest in connecting to the AMASS platform.
- **Seminar at A4T**. Changé, France. January, 2018.
  Feedback: Interest in AMASS support for safety and security analysis.
- **Seminar at CEA**. Paris, France. June 12, 2017.
  Feedback: Interest in the integration possibilities between AMASS tools and Simulink.
- **Seminar at City University of London**. London, UK. January 29, 2018.
  Feedback: The presentation raised a general interest. Among the audience mainly composed of assurance case experts, an attendee was wondering if the focus was only on artifacts existence and nothing about the confidence of the content of the artefacts. The presenter (Barbara Gallina) explained the AMASS vision and explained that the focus on process compliance was only the focus of the presentation.
- **Seminars at FBK**. Trento, Italy. September and October, 2017.
  Feedback: The audience asked about the analyses that can be performed on system models, about requirements import from external tools (e.g. DOORS), and about collaborative work possibilities.
- **Seminar at IRIT**. Toulouse, France. October 25, 2017.

Feedback: The presentation raised a general interest. A researcher who worked on the development of code generators found interesting the AMASS proposed solution for cross domain reuse of certification artefacts.

- **Seminar at TRC**. Madrid, Spain. May 12, 2017.
  Feedback: Discussion about how TRC tools will benefit from the AMASS Tool Platform, and about their integration.
- **TeReCom 2017** - 1st Workshop on Technologies for Regulatory Compliance. Luxembourg. December 13, 2017.
  Feedback: The patterns presented in the paper were considered interesting by the audience. One comment was presented: the compliance patterns were created by using the principle of strong compliance, namely there is no place for compensations if rules are violated (called weak compliance). For this concern, we use permits, which highlight the idea of exceptions, instead of compensations. However, there is a comment to take into account in the future.
- **TRC Forum**. Madrid, Spain. November 30-December 1, 2017.
  Feedback: The solutions that TRC is developing in AMASS (e.g. quality analysis and evolution, tool integration, ontology configuration management) raised a great interest among most TRC customers.
- **WoSoCer 2017** - 7th IEEE International Workshop on Software Certification. Toulouse, France. October 23-26, 2017.
  Feedback: The presentation raised interest. A researcher mentioned about some work (conducted at the Technical University of Munich) which could be considered for future development of the approach. A representative from the City University of London proposed to give a talk at their university to further discuss the proposed solution with a broader audience of experts. The suggestion was to understand to what extent the expert judgement expected to be given by humans can be automated.

2.2.7 Publications

During the second 12 months of AMASS, the project has resulted in the following **24 scientific publications**.

2018

- Alajrami, S., Romanovsky, A., Gallina, B.: Cost-Aware Scheduling of Software Processes Execution in the Cloud. 6th International Conference on Model-Driven Engineering and Software Development (MODELSWARD 2018)
- Bartocci, E., Ferrere, T., Manjunath, N., Nickovic, D.: Localizing Faults in Simulink/Stateflow Models with STL. 21st ACM International Conference on Hybrid Systems: Computation and Control (HSCC 2018)
- de la Vara, J.L., Ruiz, A., Espinoza, H.: Recent Advances towards the Industrial Application of Model-Driven Engineering for Assurance of Safety-Critical Systems. 6th International Conference on Model-Driven Engineering and Software Development (MODELSWARD 2018)
- Gallina B., Haider, Z., Carlsson, A., Mazzini, S., Puri, S.: Multi-concern Dependability-centered Assurance for Space Systems via ConcertoFLA. 23rd International Conference on Reliable Software Technologies (Ada-Europe 2018)
- Gallina, B., Martinez, J.: Reuse in (re)certification of systems. 17th International Conference on Software Reuse (ICSR 2018)
- Gannous, A., Andrews, A., Gallina, B.: Bridging the Gap between Testing and Safety. 39th Aerospace Conference
- Parra, E., de la Vara, J.L., Alonso, L.: Analysis of Requirements Quality Evolution. 40th International Conference on Software Engineering (ICSE 2018)

- Sljivo, I., Gallina, B., Carlson, J., Hansson, H., Puri, S.: Tool-Supported Safety-Relevant Component Reuse: From Specification to Argumentation. 23rd International Conference on Reliable Software Technologies (Ada-Europe 2018)

2017

- Alajrami, S., Gallina, B., Romanovsky, A.: Enabling GSD Task Allocation via Cloud-based Software Processes. International Journal of Networked and Distributed Computing 5(4): 221-232
- Bendik, J.: Consistency Checking in Requirements Analysis. International Symposium on Software Testing and Analysis (ISSTA 2017)
- Carlan, C., Gallina, B., Kacianka, S., Breu, R.: Arguing on Software-level Verification Techniques Appropriateness. 36th International Conference on Computer Safety, Reliability and Security (SAFECOMP 2017)
- Castellanos-Ardila, J.P., Gallina, B.: Towards Increased Efficiency and Confidence in Process Compliance. 24th European & Asian Systems, Software & Service Process Improvement & Innovation (EuroSPI&Asia2-2017)
- de la Vara, J.L., Marín, B., Ayora, C., Giachetti, G: An Experimental Evaluation of the Understanding of Safety Compliance Needs with Models. 36th International Conference on Conceptual Modeling (ER 2017)
- Gallina, B., Haider, Z., Carlsson, A.: Towards Generating ECSS-compliant Fault Tree Analysis Results via ConcertoFLA. 2nd International Conference on Reliability Engineering (ICRE 2017)
- Juez, G., Amparan, E., Lattarulo, R., Perez, J., Ruiz, A., Espinoza, H.: Safety Assessment of Automated Vehicle Functions by Simulation-based Fault Injection. 2017 IEEE International Conference on Vehicular Electronics and Safety (ICVES 2017)
- Juez, G., Amparan, E., Lattarulo, R., Ruiz, A., Perez, J., Espinoza, H.: Early Safety Assessment of Automotive Systems Using Sabotage Simulation-Based Fault Injection Framework. 36th International Conference on Computer Safety, Reliability and Security (SAFECOMP 2017)
- Montecchi, L., Gallina, B.: SafeConcert: a Metamodel for a Concerted Safety Modeling of Socio-Technical Systems. 5th International Symposium on Model-Based Safety and Assessment (IMBSA 2017)
- Varkoi, T., Mäkinen, T., Gallina, B., Cameron, F., Nevalainen, R.: Towards Systematic Compliance Evaluation Using Safety-oriented Process Lines and Evidence Mapping. 24th European & Asian Systems, Software & Service Process Improvement & Innovation (EuroSPI&Asia2-2017)
- Castellanos-Ardila, J.P., Gallina, B.: Towards Efficiently Checking Compliance Against Automotive Security and Safety Standards. 7th IEEE International Workshop on Software Certification (WoSoCer 2017)
- Castellanos-Ardila, J.P., Gallina, B.: Formal Contract Logic Based Patterns for Facilitating Compliance Checking against ISO 26262. 1st Workshop on Technologies for Regulatory Compliance (TeReCom 2017)
- de la Vara, J.L., Gómez, A., Gallego, E., Génova, G., Fraga, A.: Representation of Safety Standards with Semantic Technologies Used in Industrial Environments. 6th International Workshop on Next Generation of System Assurance Approaches for Safety-Critical Systems (SASSUR 2017)
- Gallina, B., Nyberg, M.: Pioneering the Creation of ISO 26262-compliant OSLC-based Safety Cases. 7th IEEE International Workshop on Software Certification (WoSoCer 2017)
- Martin, H., Bramberger, R., Schmittner, C., Ma, Z., Gruber, T., Ruiz, A., Macher, G.: Safety and Security Co-engineering and Argumentation Framework. 6th International Workshop on Next Generation of System Assurance Approaches for Safety-Critical Systems (SASSUR 2017)
- Sljivo, I., Gallina, B., Kaiser, B.: Assuring Degradation Cascades of Car Platoons via Contracts. 6th International Workshop on Next Generation of System Assurance Approaches for Safety-Critical Systems (SASSUR 2017)

All of the publications above are open access, in accordance to the recommendations provided in D8.5 (e.g. through repositories whose information is retrieved by OpenAIRE [7]).

In addition to the 13 public deliverables listed in Section 2.2.1, the following 10 have been released:

- D2.3 - AMASS reference architecture (b)
- D3.2 - Design of the AMASS tools and methods for architecture-driven assurance (a)
- D3.7 - Methodological guide for architecture-driven assurance (a)
- D4.2 - Design of the AMASS tools and methods for multi-concern assurance (a)
- D4.7 - Methodological guide for multi-concern assurance (a)
- D5.2 - Design of the AMASS tools and methods for seamless interoperability (a)
- D5.7 - Methodological guide for seamless interoperability (a)
- D6.2 - Design of the AMASS tools and methods for cross/intra-domain reuse (a)
- D6.7 - Methodological guide for cross/intra-domain reuse (a)
- D9.3 - Second intermediate annual progress report

2.3 Communication Activities

The purpose of AMASS communication activities has been to inform general audiences (e.g. overall groups of practitioners and the general population) of the project and its results. The ultimate goal is to raise awareness of the project. All AMASS partners make every effort to communicate information concerning the project and its progress to as wide an audience as possible.

The communication activities undertaken between m13 and m24 are listed in Table 2.

Table 2. Communication activities

Event	Date	Resp.	Description
Second newsletter	Apr 2017	UC3	Vision and main achievements of the project in m07-m12, and upcoming work.
Third newsletter	Oct 2017	UC3	Vision and main achievements of the project in m13-m18, and upcoming work.

2.4 Updated Dissemination Plan

Based on the plans presented in D8.6 and the progress made up to March 2018, Table 3 presents an update of the general communication plan, and Table 4 of the dissemination plan.

Table 3. Communication plan

Event	Date	Resp.	Description
Fourth newsletter	Apr 2018	UC3	Vision and main achievements of the project in m19-m24, and upcoming work.
Fifth newsletter	Oct 2018	UC3	Vision and main achievements of the project in m25-m30, and upcoming work.
Sixth newsletter	Mar 2019	UC3	Main achievements of the project in m31-m36 and main conclusions from the project.
Press release	Mar 2019	UC3	Press release about AMASS finalisation.
Press release	Mar 2019	MDH	Press release about AMASS finalisation.

Table 4. Dissemination plan

Activity	Date	Resp.	Description
SCSSS conference	May 2018	MDH	6th Scandinavian Conference System and Software Safety/Workshop 1- Frontiers in Safety.
ICSR conference	May 2018	MDH	The International Conference on Software Reuse (ICSR) is the premier event in the field of software reuse research and technology. The main goal of ICSR is to present the most recent advances and breakthroughs in the area of software reuse and to promote an intensive and continuous exchange among researchers and practitioners. MDH and TEC will give a talk, and TRC will participate in a panel.
DASIA conference	May 2018	GMV	Data Systems in Aerospace. It embraces technical and managerial aspects of development, operations and maintenance of data-handling related components and systems.
ICSE conference	May 2018	UC3	The International Conference on Software Engineering is the premier software engineering conference, providing a forum for researchers, practitioners and educators to present and discuss the most recent innovations, research, experiences, trends and concerns in the field of Software engineering.
DeCPS workshop	Jun 2018	INT	International Workshop on Challenges and new Approaches for Dependable and Cyber-Physical Systems Engineering, in conjunction with Ada-Europe.
ECSEL JU Symposium	Jun 2018	ALT, TEC & UC3	Event focused on deep technological presentations, both about project achievements and about state-of-the-art technology, consisting of four thematic one-day workshops: Smart Cities, Smart Energy, Interoperability in CPS and IoT, and Future CPS industrial research challenges.
QUATIC conference	Sep 2018	UC3	The International Conference on the Quality of Information and Communications Technology serves as a forum for disseminating advanced methods, techniques and tools for supporting quality approaches to ICT engineering and management.
SASSUR workshop	Sep 2018	TEC & UC3	International Workshop on Next Generation of System Assurance Approaches for Safety-Critical Systems, collocated with SAFECOMP.
DECSoS workshop	Sep 2018	AIT	International workshop on Dependable Embedded and Cyber-Physical Systems and Systems-of-Systems, collocated with SAFECOMP.
WAISE workshop	Sep 2018	CEA	First International Workshop on Artificial Intelligence Safety Engineering, collocated with SAFECOMP.
SAFECOMP conference	Sep 2018	MDH	Annual event covering the state-of-the-art, experience and new trends in the areas of safety, security and reliability of critical computer application.

3. Training Progress

The training activities performed in AMASS between April 2017 and March 2018 are divided into internal and external training. Most work has focused on internal training. In addition to the training activities performed, this section presents an updated plan for training events.

3.1 Internal Training

The events in this section have been arranged for internal training in AMASS.

3.1.1 Training on the Prototype P1

The AMASS Implementation Team provided training on the Prototype P1 release of the AMASS platform developed by the partners.

The event, which was announced in the "Events" section of the AMASS website, was divided into five sessions. Each session took place between one and three hours, and the sessions were held between the 24th and 31st January 2018. The agenda is presented in Table 5, Table 6, Table 7, Table 8, and Table 9.

Table 5. P1 Training WP3 Session #1 – Friday, 26th January 2018

Training course (Total time: 1h 55 m)	Trainer	Duration
Workflow Overview	FBK – Stefano Tonetta	10 min
System Component Specification	INT – Stefano Puri	10 min
- Requirement specification	INT – Stefano Puri	5 min
Requirement Formalization		
- Formalize Requirements with Formal Properties	INT – Stefano Puri	15 min
- Define Contracts	FBK – Alberto Debiasi	10 min
- Questions	N/A	5 min
Requirement Early Validation		
- Metrics (included questions)	UC3 – Eugenio Parra TRC – Luis Alonso	30 min
Functional Refinement		
- Architectural Refinement	INT – Stefano Puri	5 min
- Contract Refinement	INT – Stefano Puri	5 min
- Contract-based Views	FBK – Alberto Debiasi	5 min
- Questions	N/A	5 min

Table 6. P1 Training WP3 Session #2 – Wednesday January 31st, 2018

Training course (Total time: 1h 55 m)	Trainer	Duration
Component's nominal and faulty behaviour definition	INT – Stefano Puri	10 min
Functional Early Verification		
- Specify Tool Connection Information for Integration of CHESS and V&V Tools	FBK – Pietro Braghieri	5 min
- Contract Validation	FBK – Alberto Debiasi	5 min
- Contract refinement analysis	FBK – Alberto Debiasi	5 min
- Contract-based Verification of Refinement for Strong and Weak Contracts	MDH – Irfan Sljivo	5 min
- Questions	N/A	5 min

Safety Analysis		
- Generate fault trees from the behavioural model and the fault injection	FBK – Marco Bozzano	10 min
- Contract-based Safety Analysis	FBK – Alberto Debiasi	5 min
- Questions	N/A	5 min
Safety Case		
- Generation of product-based assurance arguments from CHESS model	MDH – Irfan Sljivo	10 min
- Link Architecture-Related Entities	INT – Stefano Puri	10 min
- Document Generation	FBK – Alberto Debiasi	5 min
- Questions	N/A	5 min
Upcoming features		
- Savona	B&M – Markus Grabowski	5 min
- Simulation-based Fault Injection	TEC – Estibaliz Amparan	10 min
- Requirement Early Validation: V&V Manager	HON – Tomas Kratochvila, Vit Koska	10 min
- Questions	N/A	5 min

Table 7. P1 Training WP4 Session #1 – Thursday January 25th, 2018

Training course WP4 Session #1 (Total time: 2h 40m)	Trainer	Duration
Dependability assurance case modelling	TEC – Alejandra Ruiz	45 min
Contract-based multi-concern assurance	MDH – Irfan Sljivo	20 min
System-dependability co-analysis		
- Via Papyrus	CEA – Gabriel Pedroza	30 min
- Via Safety Architect	A4T – Marc Sango	25 min
- Via Concerto	MDH – Zulqarnain Haider	30 min
Questions	N/A	10 min

Table 8. P1 Training WP4 Session #2 and WP5 Session – Friday January 26th, 2018

Training course (Total time: 50 m)	Trainer	Duration
System-dependability co-analysis		
- WEFACT training	AIT – Korbinian, Sebastian	45 min
- Via WEFACT	AIT – Korbinian, Sebastian	
- Questions	N/A	5 min
OSLC KM integration in AMASS	TRC – Luis Alonso	5 min
- Questions	N/A	5 min

Table 9. P1 Training WP6 – Wednesday January 24th, 2018

Training course (Total time: 2h 15m)	Trainer	Duration
Introduction to filtering at Assurance Project Generation by Criticality/Applicability Level	TEC – Ángel López	30 min
Reuse Assistant	TEC – Ángel López	
Compliance Maps Report – New Options to Filter by Criticality/Applicability Level	TEC – Ángel López	
Questions	N/A	5 min
Management of Families-Lines		
- Variability Management Support at Process Level	MDH – Atif	20 min

- Variability Management Support at Component Level	MDH – Atif	15 min
- Cross-concern Variability Management	ViF – Robert	15 min
Questions	N/A	5 min
Semi-automatic Generation of Arguments		
- Product Arguments	MDH – Irfan	20 min
- Process Arguments	MDH – Faiz	20 min
Questions	N/A	5 min

Each part was presented by the partner and the person stated in the agenda. Sections for questions were added after blocks of sections containing related functionality.

After the meetings, the sessions were produced and uploaded as videos to the AMASS subversion repository to make them available to those partners that could not attend the training sessions. They were also published in the AMASS YouTube channel (Section 2.2.4) taking into account the restrictions stated by the presenter regarding the confidentiality of the content used in the training. When agreed, each of the parts were published in the channel if not, they were omitted.

3.2 External Training

External training is training targeted at parties not directly involved in AMASS. Most of the external training provided during the second year of AMASS was research training, as explained in the next section.

3.2.1 Research Training

Research training has addressed the transfer of knowledge based on AMASS to the research and academic communities. UC3 has already worked on this training by supervising BSc and MSc theses on topics related to AMASS that are shown below:

- Alejandro Rodriguez. “Herramienta basada en modelos para gestión de evidencias de sistemas críticos de seguridad” (Model-based tool for evidence management of safety-critical systems)
- Alvaro Menéndez. “Una aproximación para representar estándares de seguridad con una herramienta de ingeniería de requisitos basada en ontologías” (An approach for representing safety standards with an ontology-based requirements engineering tool)
- Wilheim Cervantes. “Una aproximación basada en tecnologías semánticas para la representación de estándares de seguridad” (An approach based on semantic technologies for security standard representation)
- Pavlo Rosa. “Herramienta para la gestión universal de trazabilidad entre artefactos de sistema” (Tool for universal management of traceability between system artefacts).

Other two BSc, two MSc, and three PhD theses are currently being supervised by UC3.

MDH has also started the transfer of knowledge by fertilizing master theses, defined in related projects, with AMASS-related contextual information:

- Laura Gómez Rodríguez “A tool-supported method for fallacies detection in process-based argumentation”. Thesis conducted at MDH, co-defined by Barbara Gallina and Faiz Ul Muram.
- Enrique Zornoza Moewno “Model based approach for automatic generation of standards compliant fault tree”. Thesis conducted at MDH, co-defined by Barbara Gallina and Zulquarnain Heider.

In addition, a PhD student (Julieth Patricia Castellanos Ardila) has been enrolled in November 2016 and she is working on compliance checking.

Finally, AMASS was presented by UC3 at Universidad Diego Portales, Chile, in May 2017. TEC conducted an internal course, in October 2017, to introduce people to safety and to teach them how to detect and manage risks by using the experience of the AMASS project. The attendees rated positively the global quality of the course (79%), the quality of the trainers (88%), as well as the methodology used (71%).

More information about the progress on training is presented in Table 13.

3.3 Updated Training Plan

The upcoming internal training events that have a defined date are shown in Table 10. External training events are shown in Table 11.

Table 10. Internal training events

Event	Date	Resp.	Description
Third Training for AMASS Demonstrators	Nov 2018	TRC	Training on AMASS final prototypes, around two months before their release.

Table 11. External training events

Event	Date	Resp.	Description
Quality assurance - Certification of safety-critical (software) systems	March 2018	MDH	New course related to AMASS results to be offered at MDH as part of the PROMPT initiative. http://www.mdh.se/utbildning/kurser/kursplaner-1.35552?benamning=&kurskod=DVA467&niva=&huvudomrade=&fordjupning=&akademi=&search=Search# http://www.promptedu.se
Software project management course	May 2018	UC3	Presentation of AMASS challenges and results at a course on software project management of UC3, which includes system quality assurance aspects.
Safety Critical Systems Engineering	Nov 2018	MDH	Presentation of AMASS challenges and results at a course on safety-critical systems engineering. Introduced a specific research-oriented lecture.
Videos about Prototype P2 training	Nov 2018	TRC	Publication of the videos from Third Training for AMASS Demonstrators in the AMASS website and the YouTube channel

4. Conclusion

This document has presented the methods used and activities performed for dissemination and training of AMASS results during the second year of the project (April 2017-March 2018). Both dissemination and training are essential to increase the impact of the AMASS project. The entire consortium has engaged in collaborative and coordinated actions to make third parties aware of AMASS results and know how to exploit them.

Dissemination activities have aimed to promote project results, communicate achievements in the project, and raise interest in the solutions developed. The preparation and deployment of means such as the AMASS website, project presentations, leaflets, and social media accounts have greatly contributed to these activities. Event organisation and participation, and publications have also played major roles in informing others about AMASS.

Regarding training, AMASS partners have provided industrial and research stakeholders with new knowledge and upgraded skills regarding CPS assurance and certification, and have collaborated to overcome the potential gaps between AMASS results and their application. Internal training has been essential to ensure a common, shared understanding of CPS assurance and certification, how to tackle these activities, and how to improve them. A training event has been run on the new version of the AMASS Tool Platform.

The progress made in dissemination and training during the second project year is aligned with the plans presented in D8.5 [4] and D8.6 [5]. D8.8 will report on the progress made on dissemination and training activities in the future.

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Appendix A. Progress of the Dissemination Plan until m24

All the planned general activities for dissemination, from April 2017 to March 2018, presented in D8.5 [4] and D8.6 [5] have been performed. These activities are listed in Table 12.

Table 12. Planned dissemination activities

Activity	Date	Resp.	Description
DIF conference	May 2017	TEC & ALT	Industry-driven Digital innovation conference in Europe, showing R&I results and emerging challenges towards a vision on the future for and built by industry.
DeCPS workshop	Jun 2017	INT	International Workshop on Challenges and new Approaches for Dependable and Cyber-Physical Systems Engineering, in conjunction with Ada-Europe 2017.
ECSEL JU Symposium	Jun 2017	TEC & UC3	Event focused on deep technological presentations, both about project achievements and about state-of-the-art technology, consisting of four thematic one-day workshops: Smart Cities, Smart Energy, Interoperability in CPS and IoT, and Future CPS industrial research challenges.
SASSUR workshop	Sep 2017	TEC & UC3	International Workshop on Next Generation of System Assurance Approaches for Safety-Critical Systems, collocated with SAFECOMP.
DECSoS workshop	Sep 2017	AIT	International workshop on Dependable Embedded and Cyber-Physical Systems and Systems-of-Systems.
SAFECOMP conference	Sep 2017	FBK	Annual event covering the state-of-the-art, experience and new trends in the areas of safety, security and reliability of critical computer application.

Appendix B. Progress of the Training Plan until m24

Almost all the planned general activities for internal training, from April 2017 to March 2018, presented in D8.5 [4] and D8.6 [5] have been performed. These activities are listed in Table 13. A planned activity for external training has finally corresponded to a dissemination action (Table 14).

Table 13. Planned internal training events that have been held

Event	Date	Resp.	Description
Software project management course	May 2017	UC3	Presentation of AMASS challenges and results at a course on software project management of UC3, which includes system quality assurance aspects.
Presentation at Universidad Diego Portales, Chile	May 2017	UC3	Presentation of AMASS challenges and results during a short stay at Universidad Diego Portales.
CPS Summer School	Jul 2017	FBK	Summer school targeted at research scientists and students, and R&D experts from industry, who want to learn about advances in CPS engineering.
Training for formalization of requirements	2017	HON	Presentation of requirement formalization– comparison of state of the art approaches.
Safety Critical Systems Engineering	Nov 2017	MDH	Presentation of AMASS challenges and results at a course on safety-critical systems engineering.

Table 14. Planned external training events that have not been held

Event	Date	Resp.	Description
Training for Polarsys members	2017	TEC	Presentation of first AMASS prototype. It was finally a dissemination action, not a training one.