Security for Aviation as Key Priority for FP9:

Boosting Europe's Future Competitiveness in this crucial European and International requirement

We, the members of the Association of European Research Establishments in Aeronautics (EREA), call on the European Commission to develop the next EU Research & Innovation Framework Programme (FP9) with an appropriate design and budget concerning the essential topic of "Security for Aviation".

This societal demand requires the development, at European level, of appropriate, efficient and consistent solutions against the present and future threats to boost aviation security. For European competitiveness and for strengthening our position in the aerospace field, the EU needs to launch specific "Security for Aviation" actions at the very beginning of FP9. Indeed, it is crucial to anticipate as soon as possible the developments in the US and Asia in key concepts and technologies for efficient security solutions that meet the societal demand, the growth of the air traffic and the adaptations of the international regulations.

Several reports stated that firstly the performance assessment of security solutions and the definition of appropriate Key Performance Indicators (KPI) are today essential needs to build an aviation security policy[1,2], secondly the knowledge and the skills of the aviation security domain should be shared with other transport modes[1] and thirdly previous security studies focused mainly on the prevention and detection phases[2,3]. These conclusions show it is crucial to promote the collaborative research and the cross-fertilization between aviation and transport security domains by means of specific Calls ensuring the involvement of private and public stakeholders under the leadership of a team of research establishments.

We, as establishments involved in key aviation, civil, defense and security research for our Member States on one hand and as a strong supporter of European Research on the other hand, call on the European Commission to build FP9 with the following concrete "Security for Aviation" priorities:

- **The development of a joint simulation environment and the associated tools and platforms to assess the performance of security concepts and solutions against present and future threats.** Indeed the simulation platforms must share the protocols with the "Security for Aviation" stakeholders to assess their performances through defined KPIs (security concepts, security paradigms, security systems, vulnerability of systems, tools, metrics, process, methods,…), and through both risk and threat analysis: the goal is to identify the best solutions regarding their efficiency and trust for the protection of the civilian aviation against a set of threats taking into account the dynamics of the attack and the response of the security system. To ensure a high valuable development, the consideration of the following recommendations will be useful:

[1] Strategic Research and Innovation Agenda – 2017 update Volume 1, ACARE, 2017
[2] Research Theme Analysis Report Transport Security, European Union, 2017
[3] COPRA – Aviation Security Research Roadmap, Roadmap document, European Grant agreement n° 261651

- This joint environment is the mean to develop a comprehensive aviation security knowledge and the appropriate management of the aviation security based on the performance of the entire security system. So it is essential to use verified and validated models and to ensure the global consistency of the simulation. The tasks concerning the consistency of the simulation and the maintenance (evolution) of the platform by public actors are of utmost importance for the stakeholder's confidence in the outcomes of the aviation security performance assessment and the guarantee of the IP rights of the owners of the systems studied models. As a consequence, the high quality of the results allows us to improve the resilience of the whole aviation system and the passenger survivability.
- In order to obtain credible and valuable conclusions, this joint environment must be able to assess complex scenarios including attacks of multiple and coordinated threats against different and complementary security systems.
- For an efficient development of such key tools, synergies with the simulations activities in the defense field (e.g. wargames) have to be tackled.
- The results of studies dedicated to the evaluation of concept performances and the assessment of security solutions should be capitalized.

- **The development of dynamic risk assessment methodologies** taking into account the threats, the vulnerabilities of the aviation system and the potential security solutions is required **to reach valuable "Security for Aviation" conclusions.** The opinions of European experts involved in the fields of aviation, security and defense from different Member States are the first key step to converge on valuable and shared conclusions for Europe and Member States.
- **Models, simulations and several types of real tests** are indispensable elements **for the development of valuable solutions of protection and resilience.** The key point is the good balance between the developments of the different strategic facilities: numerical tools, experimental tools and system tests. So the development of specific testbeds and laboratory testing facilities for aviation security purposes are required in accordance with the evolution and the complexity of present and future threats.
- Although many projects were focusing on detection and prevention, **new emerging threats require further investigation on threat detection** (especially: malevolent drones; CBR&N agents; weapons; illicit traffic, abnormal behaviour…), **identification and prevention** (for example: surveillance; tracking; identification of situational recurrence…) in order to compare the efficiency and the performances of the potential system solutions (e.g. rate of success, false alarm rate…). **Also studies need to be carried out to determine** the best **measures for protection** (mainly against: aviation cyber-security attack; electromagnetic and laser weapon; laser dazzling of pilots…) and **the most appropriate reactions (prepare, respond, recover)** against the present and future threats. The final goal is to avoid fatalities, to strengthen the resilience of the global aviation system and to increase the survivability.
- **The performance of the surveillance** within the aviation system **and the monitoring of potential threats have to be evaluated taking into account ethical aspects** in order to identify and suggest to the citizens a good balance between the security constraints and the travelers' privacy (general right of personality).
- **A long-term vision with far goals and disruptive approaches has to be encouraged** in the aviation security domain. Furthermore, specific Calls for cross-fertilization with other domains (transport, ICT…) will allow the dissemination of aviation security knowledge and pave the way for the intermodality security on one hand and will simultaneously foster disruptive approaches on the other hand (e.g. security by design).

- **To establish a Civilian Aviation Security Research Network** in which all research establishments will provide complementary tools and skills in order to cover the whole "Security for Aviation" field is essential. Taking into the worldwide competition and the economic and societal challenges, it is key that EU supports such a leading network with the appropriate tools in order to strengthen the European Union's role in aviation security. This network team will lead the European communication at several levels (Non Member States, Third Parties, and International Organizations).

All the suggested priorities are dedicated to help all the "Security for aviation" stakeholders to learn about the efficiency of security solutions, to adapt the security measures to the threat evolutions, and to anticipate unknown future threats instead of reacting continuously in hindsight with new strict regulations. Furthermore, **these recommendations pave the way to take into account the issues of the development of autonomous systems, which increases dramatically the complexity of the threat management.**

We, the members of EREA, having a broad experience in collaborative research and supporting European aviation stakeholders for decades, have started discussions to build a virtual "Security for Aviation" Lab based on our research network. We have substantial assets (facilities, research infrastructures, skills, systems…) which can contribute to fulfill the European needs in aviation security. **Moreover we are able and also used to investigating and analyzing threats and security systems based on generic models and components in order to overcome limitations due to IPR and national classification issues.** We are ready to strengthen our cooperation with the European Commission in order to define and to implement an ambitious FP9 programme to position Europe as a global leader on this crucial international and societal challenge and consequently to safeguard our growth and the European employment in transport and in particular in civilian aviation.