

Executive summary

“European Strategic Wind tunnel Improved Research Potential” ESWIRP is a project in the EU 7th Framework program (FP7) and it is designed to improve the performance capabilities of the three strategic wind tunnels in Europe by intensifying the cooperation between three key wind tunnels in a new consortium. The research consortium members are ONERA operating the S1MA as its largest transonic wind tunnel, DNW operating the LLF as its largest low speed wind tunnel and ETW operating its cryogenic transonic wind tunnel. Together these wind tunnels cover a wide range of experimental situations of relevance for civil aviation and other research.

The project started on October 2009 for a period of 5 years. The European financial contribution is € 7.2 million.

The contents of the project consist of two major components, the improvements to the testing infrastructure and the provision of access to research groups which do not usually have the means to access such large scale testing capabilities. These are flanked by public dissemination and information activities.

Although the tunnels covered in this project are of complementary nature, the infrastructure activities are joined together by a common representation of and approach to the tunnel performance characteristics. For this a generic model of a virtual wind tunnel was developed, enabling operators to assess the effect of the control parameters upon the testing conditions. The final aim of all participants is to provide the user community an improved capacity to test their innovative ideas and to be able to do this with increased reliability.

In the provision of access to those major wind tunnels, mainly research groups from European universities have been targeted. The approach taken has been that of maximum transparency of process and support of the researchers by the organizations responsible for the tunnels. And when possible, bringing research groups together to obtain full benefit of economies of scale in the research projects is encouraged.

ESWIRP responds to the so-called targeted approach of the Integrating Activities of the FP7 Capacities Work Programme:

* **Networking activities**, essentially focused around 4 topics:

- Organisation of information campaigns, lectures and workshops to disseminate knowledge between the partners and future users,
- Opening of a website for the consultation of wind tunnel standards,
- Exchange of personnel between the Consortium partners to foster spreading of good practices and exchange technical know-how,
- Joint development of a reference wind tunnel parameter database.

* **Trans-national access and/or testing services**: after the call for proposals by the facility providers, groups of researchers had the opportunity to have a free access to wind tunnel services, including technical assistance to support the corresponding scientific research team.

* **Joint research activities**: By innovative modeling of wind tunnels to help designers to make better decisions before the implementation of novel hardware. This is the first time that mathematic modeling will create a standard for wind tunnels. The infrastructure improvements are targeting the capability to obtain unsteady test data at high accuracy in the ETW, to improve the capability to simulate aircraft behavior in ground proximity in the LLF and to establish a reliable closed loop Mach number control in the S1MA wind tunnel.

ESWIRP is a European support for strategic wind tunnels, key research infrastructures in the development process of current and future aircrafts. This is the first time that Europe offers such support. After this first step, the ESWIRP Consortium wishes for the long term support complementary to existing European national support to maintain these wind tunnels at the highest level.