

SP1-JTI-CS-2013-02

Power cable modelling for WIPS  
electromechanical chain

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**Deliverable 6**

**PROJECT WEB PAGE**

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MCIA Research Center



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# MULTYCAB

February 2015, Deliverable 6, Web Page

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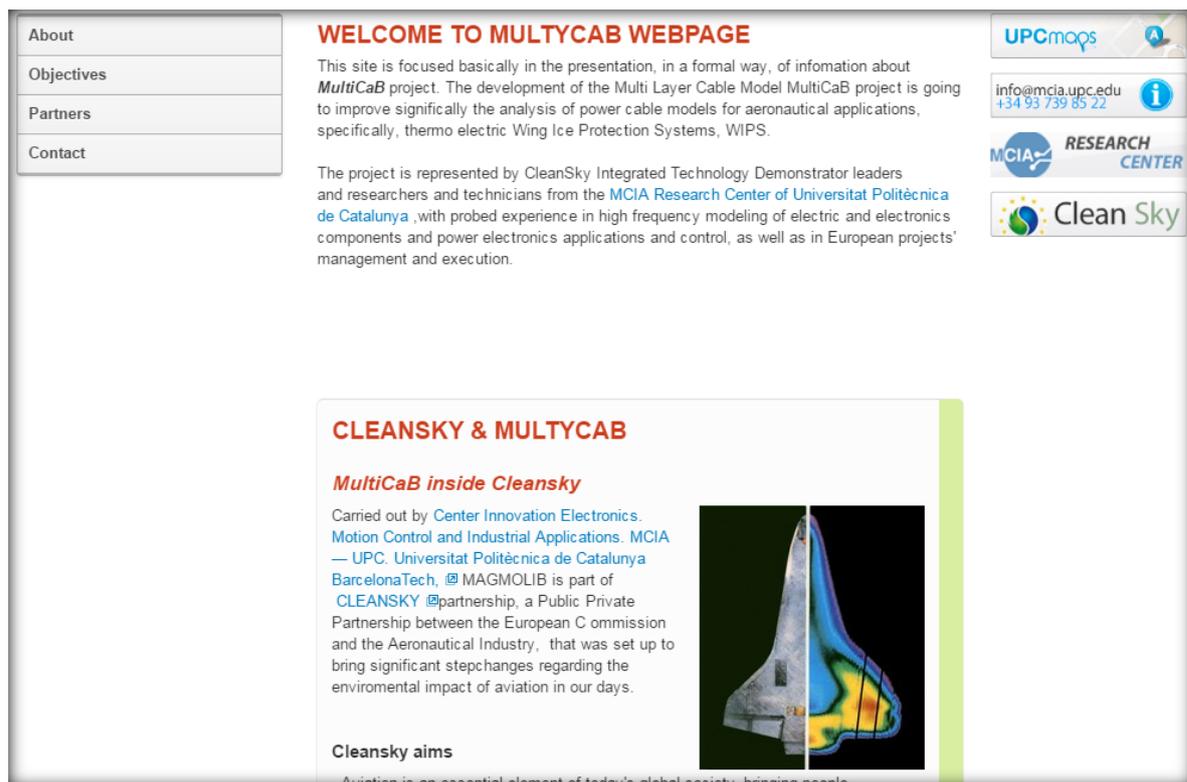
## 1 Introduction

This report describes the project activity carried out by the MCIA (Motion Control Industrial Applications) group at the UPC (Universitat Politècnica de Catalunya) for completion of the task concerning website publication. The website itself is an outcome of this activity but however this document provides an overview of the project activity corresponding to this task and presents the aforementioned webpage.

## 2 Website

### 2.1 Welcome page

Initial Web page is : <http://multycab.upc.edu/en>. This initial page provides general information about the project, its objectives, partners (logos) and useful links (info, maps, Clean Sky, etc.).

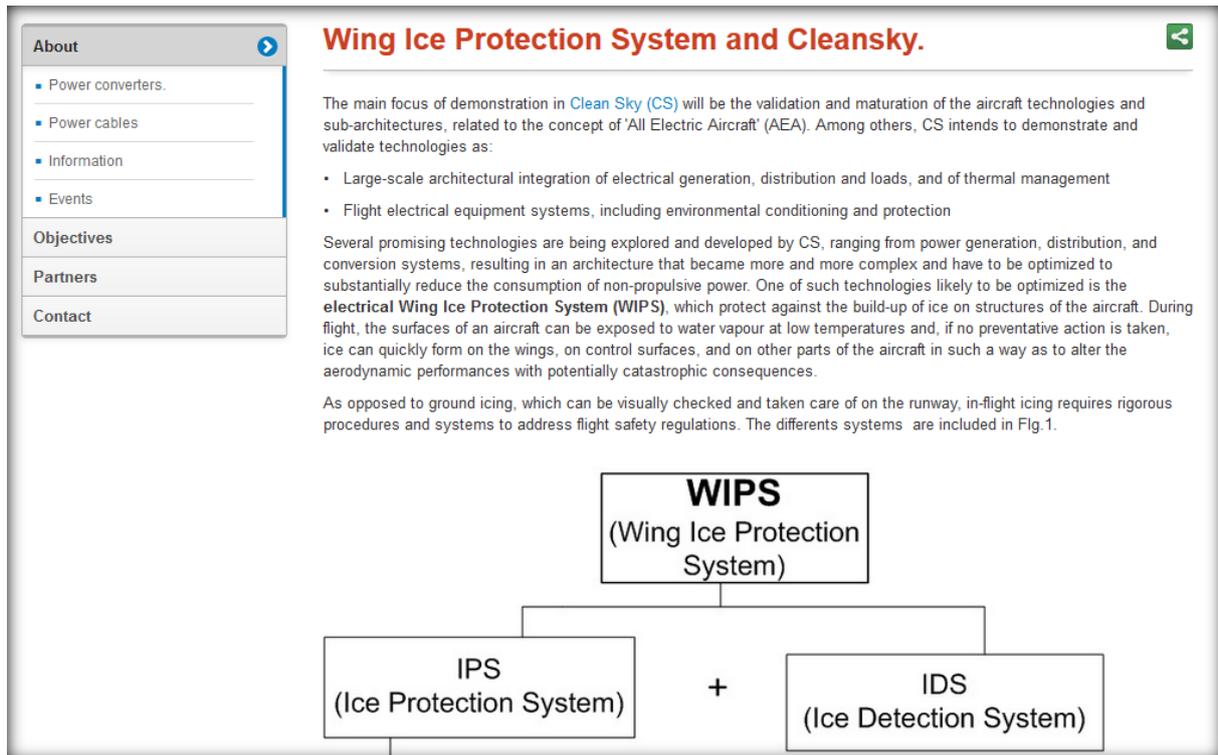


The screenshot shows the 'WELCOME TO MULTYCAB WEBPAGE' section. It includes a navigation menu on the left with links for 'About', 'Objectives', 'Partners', and 'Contact'. The main content area features a 'WELCOME TO MULTYCAB WEBPAGE' heading, followed by a paragraph describing the project's focus on power cable models for aeronautical applications. Below this is a paragraph about the project's representation by CleanSky and MCIA. To the right, there are logos for 'UPCmaps', 'info@mcia.upc.edu', 'MCIA RESEARCH CENTER', and 'Clean Sky'. A section titled 'CLEANSKY & MULTYCAB' includes the sub-heading 'MultiCaB inside Cleansky' and a paragraph detailing the project's partnership between the European Commission and the Aeronautical Industry. A small image of a wing with a heat map is also visible.

Figure 1. Welcome page screen

## 2.2 About

This site gives information about a general concept of the project, wing ice protection systems. It contains submenus with additional design data about power converters, power cables, reports and special events regarding project execution and dissemination.



**About**

- Power converters.
- Power cables
- Information
- Events

**Objectives**

**Partners**

**Contact**

### Wing Ice Protection System and Cleansky.

The main focus of demonstration in **Clean Sky (CS)** will be the validation and maturation of the aircraft technologies and sub-architectures, related to the concept of 'All Electric Aircraft' (AEA). Among others, CS intends to demonstrate and validate technologies as:

- Large-scale architectural integration of electrical generation, distribution and loads, and of thermal management
- Flight electrical equipment systems, including environmental conditioning and protection

Several promising technologies are being explored and developed by CS, ranging from power generation, distribution, and conversion systems, resulting in an architecture that became more and more complex and have to be optimized to substantially reduce the consumption of non-propulsive power. One of such technologies likely to be optimized is the **electrical Wing Ice Protection System (WIPS)**, which protect against the build-up of ice on structures of the aircraft. During flight, the surfaces of an aircraft can be exposed to water vapour at low temperatures and, if no preventative action is taken, ice can quickly form on the wings, on control surfaces, and on other parts of the aircraft in such a way as to alter the aerodynamic performances with potentially catastrophic consequences.

As opposed to ground icing, which can be visually checked and taken care of on the runway, in-flight icing requires rigorous procedures and systems to address flight safety regulations. The different systems are included in Fig. 1.

```

graph TD
    WIPS["WIPS  
(Wing Ice Protection System)"] --- IPS["IPS  
(Ice Protection System)"]
    WIPS --- IDS["IDS  
(Ice Detection System)"]
    IPS --- Plus["+"]
    Plus --- IDS
  
```

Figure 2. 'About' section screen

## 2.3 Objectives

In this section precise objectives are defined and presented. Specific research topics are highlighted.

- Define and develop a Multi Layer Cable Model
- Research in cable models and high frequency effects
- HMI application interface

Two different layers of the model which are considered in the project are depicted in the figure of the scheme flow:

- Lumped parameters cable model, single cell cable
- Multi lumped parameters cable model, n cells

About
Objectives
Partners
Contact

## Main Objectives.

The Multi Layer Cable Model *MultiCaB* project aims to research and develop advanced parametric power cable models for aeronautical applications, specifically, thermo electric Wing Ice Protection Systems, WIPS.

Apart from basic voltage and current analysis, models must allow to simulate and study high frequency effects, such as skin and proximity effects, standing waves and resonances, conductive and isolation losses and temperature effects.

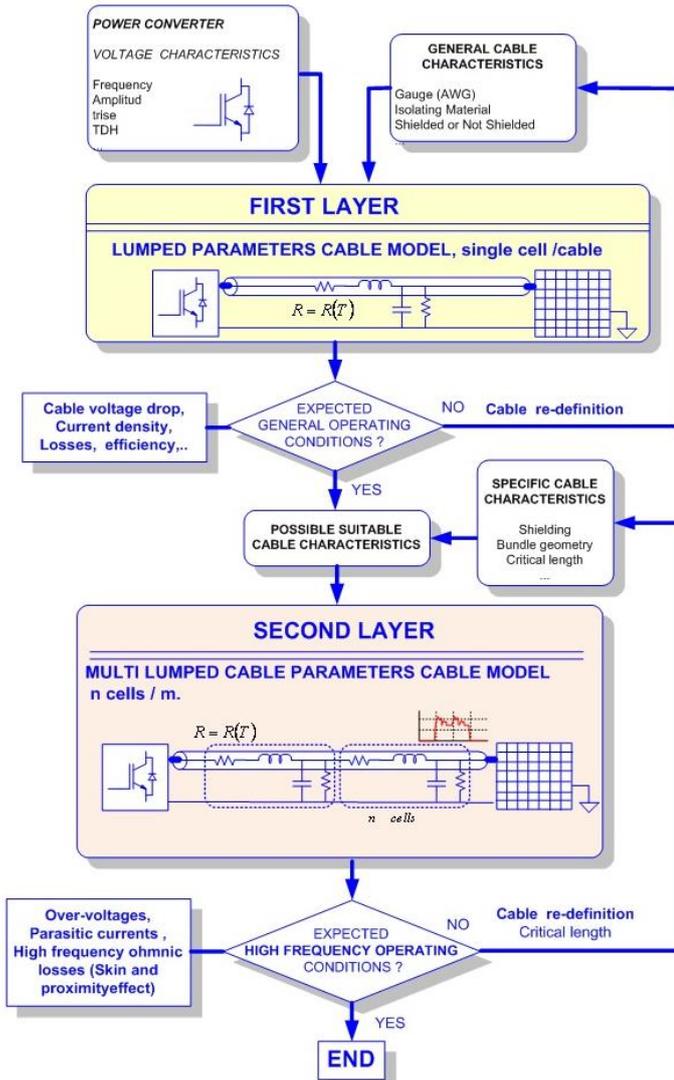


Figure 3. 'Objective' section screen

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## 2.4 Partners

This page provides short description of MultyCab partnership framework.

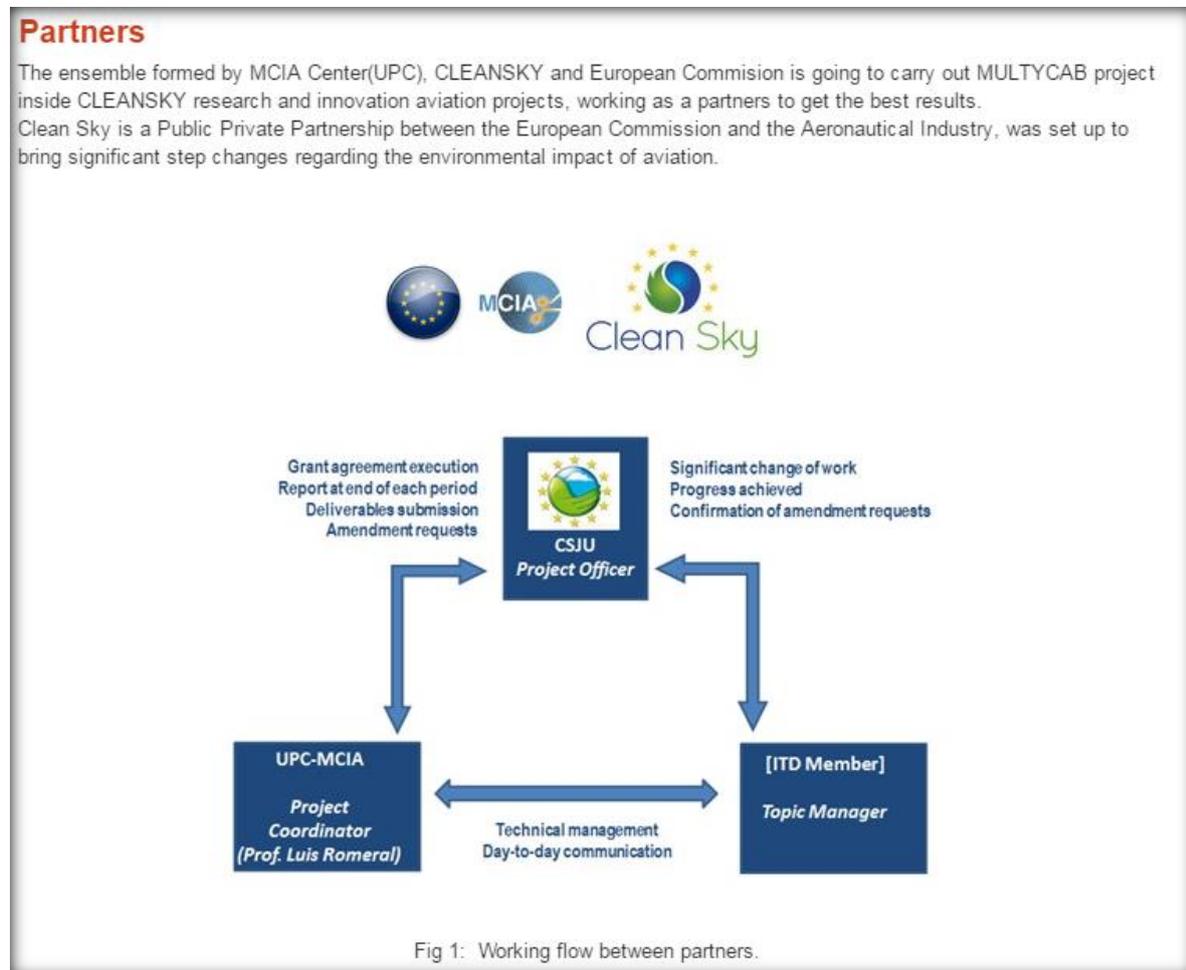


Figure 4. 'Partners' section screen

## 2.5 Contact

This page contains the contact data of the MCIA Research Center and its director Luis Romeral.

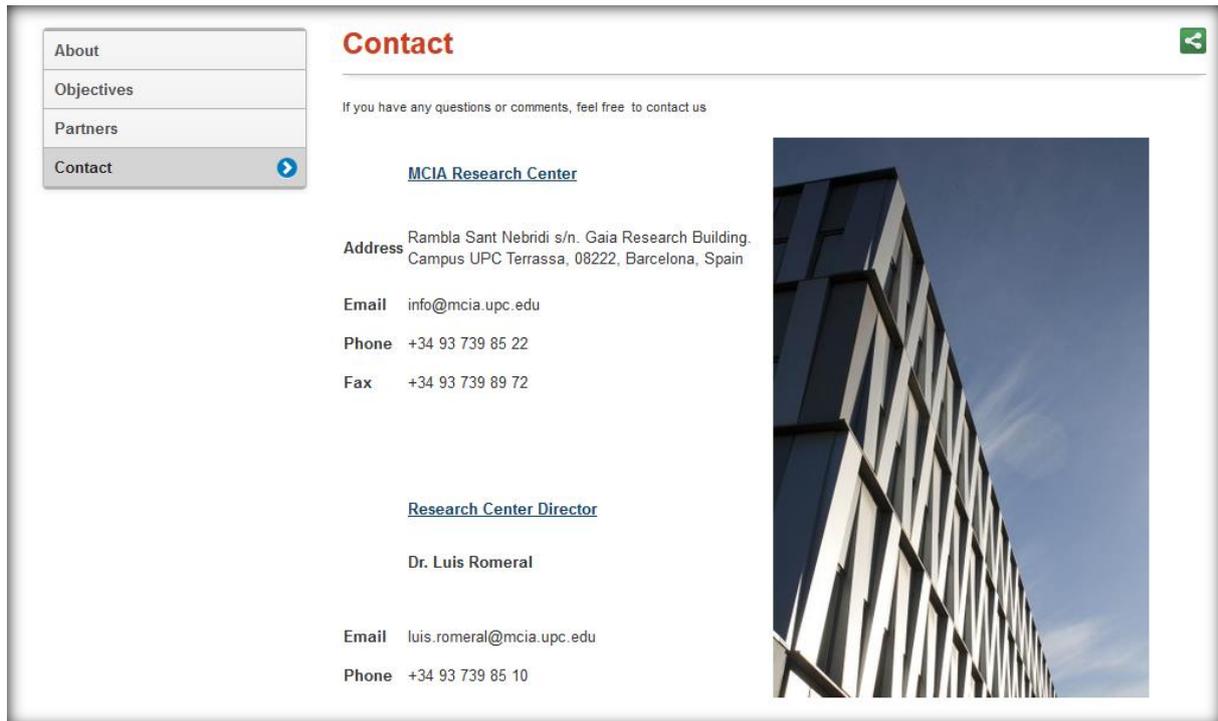


Figure 5. 'Contact' section screen

## 2.6 Intranet.

The Web Page includes an Intranet (Inner Information Project) that is accessible through the Tab of the website "Log in". By using the corresponding user and password, specific information about Consortium Legal Documents, Reports, Work Packages, Deliverables, etc., can be revised and downloaded. This Intranet is also used as exchange site and data repository for the Consortium partners.

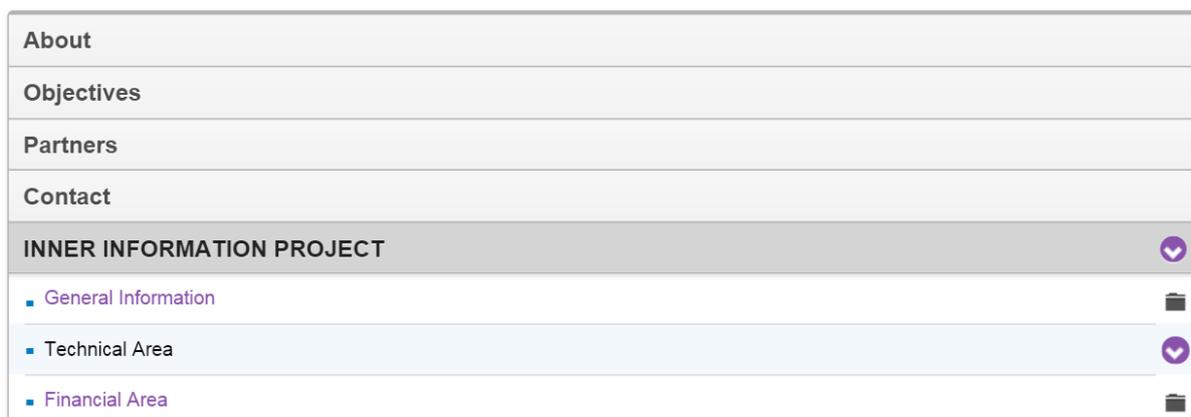


Figure 6. "Intranet" section screen

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