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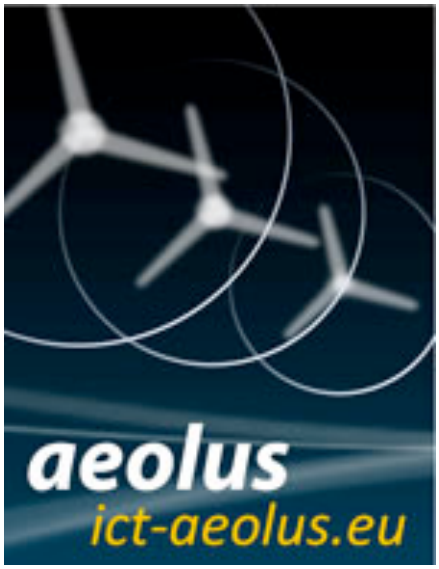
This deliverable describes the plans for the dissemination of knowledge gained during the project work and the exploitation plans of the results for each of the participants in the project.



Dissemination and Use Plan

Project: Aeolus

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History of this Document

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D0.1	1 Oct. 2008	Per Brath	Draft edition
rev1	20 Nov 2008-11-20	Eik Herbsleb	Add review info from ISC-ltd and UZAG-FER
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1. Abstract

This deliverable describes the plans for the dissemination of knowledge gained during the project work and the exploitation plans of the results for each of the participants in the project.

2. Introduction

2.1. Scope

This document is the Dissemination and Use Plan prepared for the project Aeolus. This document was prepared under Work Package 5 (Case study, dissemination and exploitation), Task T5.3 (Dissemination and use plan) of the current project.

The document sets out to describe the scope of the dissemination activities of the Aeolus project. Particular attention will be given to the various levels on which the numerous dissemination activities will unfold. Future dissemination activities may be evaluated against intentions as specified below, thus making it possible to indicate a measure of success in this area.

This document is intended to be a dynamic document. It is assumed that major parts of the Dissemination and Use Plan can only be written or specified as the project move forwards. It is therefore expected that various updates of this document will occur during the project duration.

The intended readership of this document is comprised by all project participants and the European Commission.

All disseminations must follow the guide lines agreed on in the signed Consortium Agreement for Aeolus.

3. General activities

3.1. Publications in Journals

The mixture of the AEOLUS consortium will ensure that the dissemination of project results will take place on a broad platform. The AEOLUS project partners will publish articles and news about AEOLUS in relevant national and international journals, both in paper and in electronic form.

It is planned to make use of a large variety of journals, thus presenting the project not only to the world of libraries and archives but also to a larger interested public.

Scientific journals in the wind energy sector include Wind Energy and to a lesser extent Wind Engineering. Magazines with a broader target group

include Wind Power Monthly and Wind Directions.

Scientific journals in control engineering area include IEEE Tran. on Aut. Con., IEEE Tran. Cont. Sys. Tech, Automatica, Control Eng. Practice, IEEE Con. Sys. Magazine, and Int. J. Con.

3.2. Presentations at Conferences and Meetings

As is the case with all European projects, AEOLUS is justifiably expected to observe current developments in the area of its activities.

The attendance of project partners at relevant conferences and meetings will ensure that the public will be informed at all stages about the work of AEOLUS and that AEOLUS will be aware of other projects' and research groups' activities world wide.

Relevant conferences, meetings and events organized and hosted by the European Commission will be attended as appropriate. Other conference series include EWEC, EOW, and TORQUE (organized by EWEA), and WindPower (organized by AWEA) and AIAA Aerospace Sciences Meeting (organized by AIAA and ASME). In addition there is the annual PhD Seminar on Wind Energy in Europe (organised by EAWE). Control conferences such as ACC, CDC, ECC, CCA, and other IEEE and IFAC conferences which are relevant to control will be attended by Aeolus partners.

3.3. Public Project Reports

Public versions of progress reports to the Commission will be prepared. They will be made available through the website in the form of executive summaries and will give detailed information about the AEOLUS activities of every institution involved in the project. Thus, all major project activities and proceedings will be reported to the public and are therefore traceable.

3.4. Partners descriptions of dissemination

The remaining chapters of this document are dedicated to partner's description of their plan for dissemination. The descriptions are made uniform by having equal section headlines related to partner role, target groups, actions, and future activities.

4. Aalborg University

4.1. Partner role and nature of intended results

The Department of Electronic Systems is the biggest department at Aalborg University with 75 faculty staff and 70 PhD students, and is active primarily in mobile communication, acoustics and automatic control. The control group is actively involved with modelling, analysis and synthesis of control systems and has a strong industrial profile and presence.

Aalborg will be coordinator of the project, lead WP2 on dynamic models for wind field predictions and will also be active on several subtasks of WP5 and

WP1.

4.2. Target groups for dissemination and use

The scope of dissemination strategy at Aalborg University covers mostly the research publications at international scientific journals and conferences. The target groups are the researchers at institutions, and companies who do research, design, and development in the area of wind farm modelling and control.

4.3. Dissemination actions up to deliverable D 3.2

4.3.1 Publications and conference participation

Distributed Control of Large-Scale Offshore Wind Farms. / Knudsen, Torben ; Bak, Thomas ; Soltani, Mohsen. 2009. 8 p. Conference: European Wind Energy Conference and Exhibition (EWEC) 2009, Marseille, France, March 16, 2009.
Modeling and Simulation of Offshore Wind Farms for Farm Level Control. /Soltani, Mohsen ; Knudsen, Torben ; Bak, Thomas. In: Proceedings of The European Offshore Wind 2009.

Prediction Models for Wind Speed at Turbines in a Farm with Application to Control. /Knudsen, Torben ; Soltani, Mohsen ; Bak, Thomas. 2009. Conference: Euromech Colloquium 508 on Wind Turbine Wakes, Madrid, Spain, October 20, 2009.

Turbulence Estimation Using Wind Spectra. / Soltani, Mohsen ; Knudsen, Torben ; Bak, Thomas. Submitted to ACC 2009.

Wind speed dynamical model in a wind farm. Soleimanzadeh, M. and Wisniewski, R. *The 8th IEEE International Conference on Control & Automation,* **2009**, Submitted.

4.3.2 Exhibitions and meetings

- Concertation Meeting on Control of Large-Scale Systems, 26-27 jun 08, Brussels, BE
- Meeting with TOPFARM, 7 oct 08, Risø, DK
- Workshop on Monitoring and Control for Energy Efficiency, 20 oct 08, Brussels, BE
- Concertation Meeting on Control of Large-Scale Systems, 21 oct 08, Brussels, BE
- Wind and Energy dissemination, 14 nov 08, Lund, SE
- High Level Event on Information and Communication Technologies for Energy Efficiency, 19-20 mar 09, Brussels, BE
- Czech Innovation Day, 2-3 jun 09, Brno, CZ
- PHYSCON 09, 1-2 sep 09, Catania, IT
- EU-Brazil Computing , Embedded and Control Systems Workshop, 8-10 oct 09, Sao Paulo, Brazil
- Concertation Meeting on Control of Large-Scale Systems, 5-6 oct 09, Brussels, BE
- Euromech Colloquium 508, 20-22 oct 09, Madrid, ES

4.4. Planned future dissemination activities

- Participation in EWEC2010 with one paper
- Participation in EWEC2011 with one paper
- Participation in Torque2011 with one paper
- Participation in ACC2011 with one paper
- Journal paper in Wind Energy (Wind Farm Modeling)
- Journal Paper in Control Engineering Practice (Benchmark for control designers)
- Two Ph.D theses are expected to be submitted by 2011 and 2012

5. Lund University

5.1. Partner role and nature of intended results

The Faculty of Engineering (LTH) is one of the most important faculties of Lund
University, one of Scandinavia's largest establishments for higher education and research. LTH is also one of Sweden's largest higher educational institutes for the technical and engineering sciences. The Department for Automatic Control is recognized world-wide for contributions to modelling, analysis and synthesis of control systems, with particular attention to optimisation, real-time aspects and distributed control.

Lund University will lead WP4 but will also be active in other work-packages. In WP4 distributed algorithms based on virtual price mechanisms will be developed.

5.2. Target groups for dissemination and use

The dissemination strategy aims mainly at research publications, and international conferences.

5.3. Dissemination actions up to deliverable D4.1 and D4.2

Presentation at ACC2009 of the paper "Dynamic Dual Decomposition for Distributed Control"

Presentation at CDC2009 of the paper "Gradient methods for iterative distributed control synthesis"

Submission of the paper "Distributed Model Predictive Control with Suboptimality Bounds" for ACC2010CDC2010

Poster presentation of AEOLUS at CPSWEEK, April 12-16, Stockholm 2010.

Presentation at ACC2011 of the paper "A Distributed Power Coordination Scheme for Fatigue Load Reduction in Wind Farms"

Presentation entitled "Distributed feedforward control of wind farms: prospects

and open problems", Aeolus side event at EWEA 2010, March 14, 2011 Brussels, Belgium.

Presentation entitled: "Distributed feedforward control of wind farms: prospects and open problems", French-Israeli Workshop on Delays & Robustness, April 3-5, 2011, Technion—IIT, Haifa, Israel;

Presentation entitled: "Optimal Power Distribution in Wind Farms", Aeolus workshop on Improved Control of Wind Farms, May 25-26, Glasgow, Scotland.

Submission of the paper ""Decentralized feedforward control of wind farms: prospects and open problems" to CDC2011

5.4. Planned future dissemination activities

Submission of paper for CDC 2010.Journal submission for Automatica. This paper will present dynamic dual decomposition applied to methods for distributed control of a wind farm.

Presentation of paper "A Stationary Turbine Interaction Model for Control of Wind Farms", IFAC World Congress, August 2011, Milan, Italy.

6. Industrial Systems and Control Ltd

6.1. Partner role and nature of intended results

ISC will lead WP3 on wind farm power/load optimisation and will also be active on several subtasks of WP2, and WP5. Furthermore, ISC will be involved in WP0 (Management).

ISC is an SME providing clients with consultancy in the form of solutions to specific problems, training and technology awareness in the field of control. ISC's application experience ranges from large process plant through ship systems to servomechanisms, with many multinational clients.

ISC will establish an optimal control method that utilises available system models and data.
The method will be scalable to systems of large complexity, where the major activities will be:
- Implement this method in software, in a simulation environment.
- Determine performance of optimal controller against conventional control.
- Ensure or adjust the optimisation method such that it is reconfigurable with respect to turbine availability. This includes (basic) fault detection.

6.2. Target groups for dissemination and use

ISC wholly owns and administers the Applied Control Technology Consortium (ACTC). A self-funding organisation, the ACTC provides members with case

studies, training courses and regular meetings held throughout the UK and internationally, on a variety of classical and advanced control topics. Its current members are 35 ‘world-class’ companies. These companies include operators of wind farms such as RWE, Scottish Power and Scottish and Southern Energy. Other companies operating in industries as diverse as Automotive, Aerospace & Defence, Chemical & Petrochemical, Energy, Marine, Metal Processing and Food and Drink Manufacturing. The ACTC also develops demonstrator software for certain new technologies.

ISC will use the supervisory control experience developed in other application areas, for example water supply networks (water companies, large process plants) and air supply systems (compressed air in chemical and pharmaceutical plant, large HVAC systems).

6.3. Dissemination actions up to 30th June 2011

6.3.1 ACTC Newsletter

Announcement of the Aeolus project, its objectives and ISC’s participation in the ACTC Newsletter of August and on ISC’s web site:

http://www.actc-control.com/enews/web/enews0808.asp#TBA1

6.3.2 Contributions to exhibitions and meetings

- Professor Mike Grimble made a presentation at the IEEE Workshop on "Problems of Transport Delay Systems in Control Applications", held in Glasgow on 28/4/2010, entitled “Transport Delay Compensation for Linear and Nonlinear Stochastic Systems with Application to Offshore Wind Farms”.
- Presentation on ISC’s wind farm supervisory control results by Gerrit van der Molen in Aeolus side event at EWEA 2011 in Brussels on 14th March 2011.

6.3.3 Organisation of workshop

ISC organised the two-day “Tutorial Training Workshop: Improved Control of Wind Farms”, combining lectures on basic control and signal processing theory with research results from Aeolus. The workshop was held in Glasgow on 25-26 May 2011. It included presentations from all Aeolus partners and attracted approximately 40 attendees (attendance was somewhat limited due to flight restrictions because of a volcanic ash cloud). For those that could not attend the workshop a short course has been planned and offered to companies like RWE. This course includes a brief overview of all of the original talks and will be taken to the company premises for presentation.

6.4. Planned future dissemination activities

To encourage dissemination to ACTC members, public reports from the project can be made downloadable from the ACTC web-site. Presentations at ACTC meetings are planned, to be given by ISC and other Aeolus partners where appropriate. Conference papers on generic advances in nonlinear

control are also being organized with the University of Strathclyde.

7. Energy Research Centre of the Netherlands

7.1. Partner role and nature of intended results

The Energy research Centre of the Netherlands (ECN) is an independent market oriented knowledge centre for energy research and development with approximately 900 staff members. ECN's mission is to develop knowledge and technology and bring those to the market.

ECN will lead WP1 and contribute to WP2, and WP5. ECN will also give access to several years of meteorological, mechanical loads and electrical power measurements.
ECN will bring in the software WAKEFARM, PHATAS and SWIFT.

7.2. Target groups for dissemination and use

Wind turbine (rotor blade) designers/manufacturers and designers/developers of offshore wind farms.

7.3. Dissemination actions up to deliverable D1.8

The material in deliverable D1.3 has been presented at Euromech Colloquium 508 "Wind Turbine Wakes" (Madrid, October 2009).

The material in D1.1-D1.3 has been presented as scientific poster and has been published as scientific paper in the Scientific Track of EWEC 2010 (Warsaw, April 2010).

The material in D1.3-D1.4 has been presented with full paper at Torque 2010 (Heraklion, June 2010).

The material in D1.1-D1.5 has been presented as poster with paper at iTi 2010 Conference on Turbulence (Bertinoro, September 2010).

The progress in D1.1-D1.5 has been presented at Dutch Wind Workshop 2010 (Wieringerwerf, 14-15 October 2010)

A side event on the whole project was organised at EWEA 2011 (Brussels, 14-17 March 2011), and the material in D1.5-D1.8 has been presented in that side event

The material in D1.8 has been presented with paper at EWEA 2011 (Brussels, 14-17 March 2011).

A side event at EWEC 2010 on the whole project was organised but was cancelled because of flight disruptions.

7.4. Planned future dissemination activities

An abstracts amongst others on the material in D1.8 has been accepted to 2011 IEEE Multi-Conference on Systems and Control, Denver, USA, 28-30 September 2011.

8. University of Zagreb

8.1. Partner role and nature of intended results

University of Zagreb, Faculty of Electrical Engineering and Computing is the largest technical faculty and the leading educational and R&D institution in the fields of electrical engineering and computing in Croatia. UZAG-FER is organized in 12 departments with 130 professors and 200 research assistants

UZAG-FER will contribute to WP3 on wind farm power/load optimisation, disturbance rejection and reconfigurable control. Furthermore, UZAG-FER will be active on several subtasks of WP5 and WP1.

8.2. Target groups for dissemination and use

Primary target group for dissemination and use is scientific community, from both wind energy and control system field.

8.3. Dissemination actions up to June 2011

- An abstract submitted to Torque 2010 (material described in D 3.1 part 2)
- Full paper and oral presentation at Torque 2010 (Heraklion, June 2010) (material from D3.1)
- Participation in Aeolus workshop at EWEA 2011
- Full paper and oral presentation at 18th International Conference on Process Control (material from D3.3)
- Original scientific paper accepted for Automatika – Journal of Control, Measurement, Electronics, Computing and Communications (material from D3.3)
- Presentation at Vestas Control Seminar Series in July 2011
- Paper accepted for oral presentation at IFAC World Congress 2011 (Milan, September 2011)

8.4. Planned future dissemination activities

- two journal paper submissions by the end of 2011
- At least one Ph.D. thesis will cover parts of project research (Submission expected in 2012)

9. Vestas Wind Systems A/S

9.1. Partner role and nature of intended results

Vestas Wind Systems A/S is the world's leading producer of high-tech wind power systems. Vestas' core business comprises the development, manufacture, sale, marketing and maintenance of wind power systems that use wind energy to generate electricity.

Vestas Wind Systems A/S will lead the development on the case study, dissemination and exploitation.
The main focus area will be modelling by providing a basis for coherent model development and validation. Vestas Wind Systems A/S will contribute to the activities in the other work package to guide the research activities in terms of relevance for the Aeolus consortium.

9.2. Target groups for dissemination and use

The dissemination strategy aims mainly at research publications, international events, presentations and workshops.

9.3. Dissemination actions up to deliverable D5.5

D5.3 is frequently updated during the project period and published at the official project homepage http://www.ict-aeolus.eu/index.html .

Participation in EWEC2009 and EWEC2011 for supporting Aeolus publications and gain personal relation to project participants as well external contacts.

Participation in the two-day "Tutorial Training Workshop: Improved Control of Wind Farms" organised by ISC.

Internal Vestas workshop for gather relevant information for D5.5 Plan for performance assessment.

Project objectives and deliveries have been presented for Vestas internal people for disseminate knowledge generated in Aeolus.

9.4. Planned future dissemination activities

Vestas internal presentation by a group of key person in the Aeolus project to feed information to future development projects.