The "ASSURE" Project

Discussion document for the meetings within
Wind Energy Hamburg, 27-29 September 2022

The ASSURE project

➢ HWEA participates in a project titled "Automated specialized surveillance radar application technologies for accurately assessing and mitigating the effects of wind-turbine generated electromagnetic wave scattering - ASSURE"

➢ It is funded by the Operational Program "Competitiveness, Entrepreneurship & Innovation" (EPAnEK) and was approved by the C (2014) 10162 final EU Decision of 18/12/2014

➢ The Project Partnership consists of 5 actors: 2 Research Organizations (The Institute of Communication and Computer Systems of NTUA (ICCS) and the Telecommunication Electronics Factory, the competent Directorate of the Hellenic Air Forces) and 3 business (European Dynamics, ENTEKA, HWEA), each providing the experience, know-how and expertise to achieve the project's objectives.

➢ The scope: The project aims at developing specialized radar analysis and radar management technologies for surveillance applications, in particular facilitating detection, identification and tracking of targets, in a burdened electromagnetic environment, by reducing false alarms and increasing the probability of detection. ASSURE aspires to address the above issues by developing an automated, parametric and extensible software tool based on accurate theoretical models and simulation parameters that visualizes the effects of wind farms using topographic data in a user-friendly environment

Project Description

The purpose of the ASSURE project is to design, develop and evaluate an innovative, reliable software tool, to accurately identify, mitigate and address the effects of clutter-specific issues on target and object tracking radar.

In particular, it proposes the design of an automated, parametric and extensible software tool to accurately assess and mitigate the effects of electromagnetic wave scattering from neighboring wind turbines on radar systems, with innovative signal processing techniques. Because of the EM scattering and clutter phenomena caused by the rotational movement of their fins, the positioning of wind farms close to the radar observation fields significantly affects their function for target identification and recognition. Accurate theoretical models and simulation parameters that visualizes the effects of wind farms using topographic data in a user-friendly environment will be used.

The outcome:
✓ The results of ASSURE can be exploited by software developers for radar systems as well as software developers for wind farm design.

✓ The licensing by the public authorities will be facilitated by examining applications more quickly, but also the installation of wind farms close to the radar observation fields, with benefits for the wind energy companies as well.

HWEA's role in ASSURE

HWEA's role in the project :

➢ Contribution to the definition of user requirements

➢ Contribution to the development of parametric models with the technical characteristics of

the wind turbines

➢ Examine case studies and European experience on the topic

➢ Undertake actions to disseminate the concept and the results of the project

HWEA's actions within ASSURE… so far

➢ The requirements of the users (wind farm operators and Licensing Services) have been defined, as well as the radar use scenarios (case studies) investigating the characteristics of effects under real conditions.

➢ Participation in developing realistic and detailed models for the different types of WTG's, and for the different types of radar, based on technical and operational characteristics (..in progress)

➢ Participation in the assessment of WTG's effects on installed radars (..in progress)

Next steps…

> ➢ Modern machine techniques will be searched and categorized learning both according to their theoretical background, as well as their limitations and advantages.

> ➢ Optimization of algorithms and investigation of supporting solutions.

> ➢ Completion of the complete software tool.

> ➢ Dissemination actions, publications to international scientific journals and conferences for the promotion of project's results to the wider scientific community.

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