DS3:
Wind Security Assessment Tool (WSAT) Workstream (Phase 3)

CONTEXT

The All-Island *Wind Security Assessment Tool (WSAT)* has been developed and installed in the Control Centres of EirGrid and SONI since November 2012. The tool assists power system controllers to maximise the utilisation of wind energy whilst continuing secure, reliable and economic operation of the power system of Ireland and Northern Ireland.

WSAT has been in operation in the National Control Centre (NCC) in EirGrid since September 2010 as a **Phase 1** of the system roll-out. The tool was initially developed for the power system of Ireland and was utilised by control engineers in the NCC for guidance in performing secure operation of the system.

Phase 2 of the project involved developing WSAT for the all-island power system and this version of WSAT was officially launched simultaneously in both Control Centres in Dublin (NCC) and Belfast (CHCC) on 19 November 2012.

This document contains a description of the plan to further develop WSAT as a core Control Centre on-line tool that assesses the system security every 15-minutes 24/7 and supports off-line analysis that EirGrid and SONI conduct to maximize wind generation in Ireland and Northern Ireland.

OBJECTIVES – PHASE 3

The key objectives of this phase are to improve the accuracy of the WSAT real-time model and extend the functionality of on-line WSAT. In addition, a specification of further software enhancements to include but not limited to frequency response and two-dimensional Wind-Load transfers will be developed.

The key deliverables for 2013 are:

- Improve WSAT's existing functionality based on the experiences in both Control Centres in Belfast and Dublin through an on-going model maintenance process. This includes but is not limited to
    - Analysing the outputs from WSAT and assessing their validity under various system configurations
    - Ongoing validation/tuning of dynamic models of generator governors
- Extend the capabilities of WSAT as follows:
    - Include frequency stability analysis and security criteria for real-time operation
- Investigate desirability and develop functional specification:
    - Reversed wind transfer(s) to account for the effect of wind as it rapidly reduces
    - Add/modify regional VSAT transfers
    - Introduce two-dimensional transfers in real-time analysis. It will help control engineers to gain a greater perspective in terms of changing wind/load conditions and how this affects the security of the system
    - Utilise security forecasts transfers
    - Overload monitoring

HIGH-LEVEL PLAN

TASK NO.	TASK / DELIVERABLE	RESPONSIBLE	DUE DATE
Get buy-in to approach for functionality extensions from stakeholders			
WSAT.06.1	Set-up Acceptance criteria for extended AI WSAT	TSOs	31/05/2013
WSAT.06.2	Establish WSAT as a core system operations tool	TSOs	31/12/2013
Validation and tuning of on-line all-island TSAT dynamic models			
WSAT.07.1	Update TSAT Model Comparison Process and Reports to include All-island model	TSOs	28/02/2013
WSAT.07.2	Complete all-island TSAT comparison versus frequency events reports	TSOs	31/05/2013, 30/11/2013
WSAT.07.3	Model adjustments and cross-validation	TSOs	31/08/2013
WSAT.07.4	Implement revised models in WSAT test server	TSOs	30/09/2013
Continuous monitoring and bringing new functionality into WSAT			
WSAT.08.1	Continue to monitor and update on-line WSAT	TSOs	On-going
WSAT.08.2	Update all-island dynamic files where appropriate	TSOs	31/10/2013
WSAT.08.3	Implement frequency criteria in AI WSAT	TSOs	31/10/2013
Investigation of new WSAT capabilities in the test server			
WSAT.09.1	Develop and test reversed transfers in AI WSAT	TSOs	31/07/2013
WSAT.09.2	Develop and test new transfers (forecast transfers or 2D-transfers)	TSOs	31/08/2013
WSAT.09.3	Create a functional specification for further functionality extensions to WSAT	TSOs	30/11/2013
WSAT Performance			
WSAT.10	Confirm that AI WSAT is performing as expected and has improved on previous WSAT version	TSOs	30/06/2013
WSAT.11	**End of Phase 3 of WSAT**	**TSOs**	**31/12/2013**