EirGrid Dynamics Model Register

Note: The format of the Dynamics Model Register has been updated to reflect the current EirGrid practice.

Introduction

At present EirGrid's assessment of dynamic behaviour for wind farm connections consists of three stages:

1. Model assessment simulation,
2. Wind farm pre-connection simulation, and
3. Performance monitoring.

Dynamic models must be provided to EirGrid to allow these assessments to take place. All transmission- and distribution-connected wind farms greater than 5 MW are required to submit, with their connection application, a wind farm dynamic model in compliance with PC.A4.10.1.2. This should be submitted to EirGrid no later than 240 business days prior to the scheduled date of connection to the power system.

This document lists the current portfolio of wind farm dynamic models that have been assessed or are in the process of being assessed by EirGrid. The assessment is based on measuring compliance with the Planning Code Appendix, PC.A4.10.1.2, of the Irish Grid Code (Version 6.0) which can be found on the EirGrid website[1].

It should be noted that the absence of a wind turbine model from this register does not signify that the turbine is unacceptable to EirGrid. Often, this means that the model has yet to be provided to EirGrid.

All dynamic models must be provided for use with PSS®E versions 30.3 CVF up to version 34 and that future versions of PSS®E will also need to be supported.

For dynamics model register queries please contact EirGrid with the following e-mail address: modelregister@EirGrid.com

[1] http://www.eirgridgroup.com/customer-and-industry/general-customer-information/grid-code/

Stages in EirGrid Dynamic Assessment

Model Assessment Simulation

The model simulation stage involves a Grid Code compliance assessment of the wind farm performance. This stage can highlight potential issues which are resolved through interaction with the customer and/or manufacturer. This stage also determines if the model is fit for purpose, i.e. error and bug free.

Wind Farm Pre-Connection Simulation

Before a wind farm connects, the customer is required to submit a dynamic study demonstrating that the proposed wind farm is in compliance with the Fault Ride Through requirements (section WFPS1.4) of the Irish Grid Code. This stage can highlight potential issues, specific to the actual connections, which are resolved through interaction with the customer and/or manufacturer.

Performance Monitoring

EirGrid also performs continuous on-site performance monitoring which also has the potential to highlight Grid Code compliance issues that were not evident in the model simulation stage.

Manufacturer	Turbine Model	Size (MW)	PSS®E Dynamic Model and Version
Acciona	AW1500	1.5	A1530x
	AW3000	3.0	A1530x
	Central Voltage Regulator	-	AWTVRG
DeWind	D6	1.25	Version 1.2
	D8	2.0	Version 1.2
Enercon	E40	0.6	Version 5.3
	E48	0.8	
	E66	2.0, 2.3	
	E70	2.0, 2.3	
	E44	0.9	Version 5.3
	E44, E48, E70, E82	-	ExF1[2] Version 1
	E44, E48, E53, E70, E82, E101, E126	-	ExF2 Version 2
	E44, E48, E53, E70, E82, E92, E101, E115, E126	-	ExF2 Version 4
	E82	-	ExS3 Version 2b
	Control Unit Model	-	EFCU06 (Mvar)

[2] ExF1 is a component model, ExF2 is a performance model

Manufacturer	Turbine Model	Size (MW)	PSS®E Dynamic Model and Version
Gamesa	G5X	0.85	Version 4.2
	G9X	2.0	Version 4.2
	G97	2.0, 2.1	GD0803
GE	[3]GETW 1.5 MW [DFIG]	1.5	GEWTG2 Version 2.3.1
	GETW 1.6 MW [DFIG]	1.6	GEWTG2 Version 2.3.1
	[4]GEWT [FCVT]	2.5, 2.75, 4.0	GEWTG2 Version 2.3.1
	GEWT [DFIG]	2.5, 2.75, 4.0	GEWTG2 Version 2.3.1
	GEWT [DFIG]	1.6, 2.5, 2.85, 3.2	GEWTG2 Version 600
Lagerwey	L82	2.3	
	L93	2.6	
	L100	2.5	
Nordex	N80	2.5	Version 2.2
	N90	2.3	Version 1.2
	N90	2.5	Version 1.2
	N100	2.4	Version 2.0
	N117	2.4 – 2.5	Version 1.0
	N100	3.3	Version 1.0

[3] DFIG: Doubly-fed induction generator
[4] FCVT: Fully converted turbine

Manufacturer	Turbine Model	Size (MW)	PSS®E Dynamic Model and Version
Senvion[5]	3.4M104 50Hz	3.4	R31002
	3.2M114	3.17	R32B10
	MM82	2.05	R20B10
	MM92	2.03	R22B10
	Power Management Unit	-	R00012
Sinovel	SL1500	1.5	-
	SL3000	3.0	-
Siemens	1.3 MW^{BONUS}	1.3	Version 9
	2.3 MW^{BONUS}	2.3	Version 9
	3.6 MW^{BONUS}	3.6	Version 1.02a
	(SWT-2.3-82) (SWT-2.3-93) (SWT-2.3-101) (SWT-2.3-113)	2.3	SWTVS4-V1.0
	(SWT-3.6-107) (SWT-3.6-120)	3.6	SWTVS4-V1.0
	(SWT-3.0-101) (SWT-3.0-108) (SWT-3.0-113)	3.0	SWTVD4-VS-DD V1.0

[5] Formerly REpower

Manufacturer	Turbine Model	Size (MW)	PSS®E Dynamic Model and Version
	(SWT-3.2-101) (SWT-3.2-108) (SWT-3.2-113)	3.2	SWTVD41-VS-DD V1.0
Vestas	V52	0.85	Version 7.3
	V80 VCS[6]	2.0	Version 7.7
	V90 VCS	1.8	Version 7.7
	V90 VCS	2.0	Version 7.7
	V90 VCS	3.0	Version 7.7
	V90 GridStreamer	1.8	Version 8.1.1
	V90 GridStreamer	2.0	Version 8.1.1
	V105 GridStreamer	3.3	Version 8.1.1
	V105 GridStreamer	3.45	Version 8.1.1
	V112 GridStreamer	3.0	Version 8.1.1
	V112 GridStreamer	3.3	Version 8.1.1
	V112 GridStreamer	3.45	Version 8.1.1
	V117 GridStreamer	3.3	Version 8.1.1
	V117 GridStreamer	3.45	Version 8.1.1
	V126 GridStreamer	3.3	Version 8.1.1
	V126 GridStreamer	3.45	Version 8.1.1

[6] Vestas Converter System

Manufacturer	Turbine Model	Size (MW)	PSS®E Dynamic Model and Version
	Power Park Controller (PCC) PPCSCI, VSSTAT, VGMSU	-	PPC_MkIII-2.1.6