Active Power Control Groups

Information Note

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EirGrid SONI

1. Contents

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1 Introduction

EirGrid can select and apply pre-set frequency deadbands to Power Park Modules (PPMs) to control aspects of their response to system frequency. To manage this process, we have set-up predefined groups of PPMs on which we can remotely, and in real-time, select the response required. These groups are known as Active Power Control (APC) groups. APC groups contain wind farms and solar farms in Ireland. Due to differing Grid Code requirements, PPMs in Northern Ireland do not currently provide this capability. This document provides an overview of APC and presents the currently defined APC groups. We intend to review this document on an annual basis and update to summarise the current configuration. For any queries or comments related to this document please contact info@eirgrid.com or info@soni.ltd.uk.

2 Active Power Control

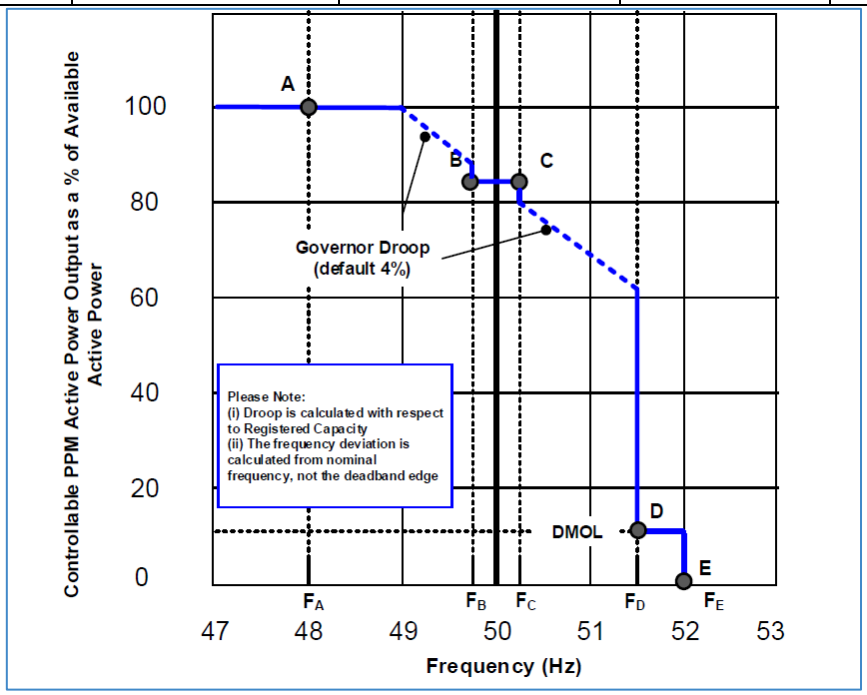
1.1. Frequency Deadband

Most PPMs normally operate with frequency response 'on' (per TSO defined 'Curve 1' settings) but with APC 'off'. In this mode the PPM is only frequency responsive outside of a deadband of +/- 200 mHz. This ensures that the PPMs do not normally adjust their output in response to frequency unless there is a contingency event on the power system such as the tripping of a generator or interconnector.

When frequency response and APC are both 'on', the PPM frequency deadband is reduced to +/-15mHz. This is the same deadband as the normal setting as most conventional synchronous generators. In this mode PPMs adjust their output much more dynamically to contribute to the control of system frequency under normal, pre-contingency, conditions.

The table and diagram below illustrate the impact of APC on frequency deadband settings.

Active Power Control	Frequency Response	Frequency Deadband	F_B	F_C
Off	On, Curve 1	-/+ 200 mHz	49.800 Hz	50.200 Hz
On	On, Curve 1	-/+ 15 mHz	49.985 Hz	50.015 Hz



Power-Frequency Response Curve for a PPM (EirGrid Grid Code Fig. PPM 1.2)

1.2. Grouping of PPMs

Each controllable PPM in Ireland (that is compliant with the 2012 EirGrid Grid Code provisions associated with frequency response as developed as part of the DS3 project) is assigned to one of six APC groups to allow for more selective management of the level of frequency response provided.

Membership of each APC group is mainly based on ensuring that there are broadly equal total capacities of PPMs within each group. The PPMs in each of the six APC groups are listed in Appendix 1.

1.3. Turning APC ON/OFF

To manage the collective frequency response of PPMs, we turn APC groups on/off by issuing control signals from our Energy Management System (EMS) to the control systems of PPMs.

For frequency response purposes, APC is turned on under the following conditions:

- During periods of high-power exports over the interconnectors to GB or high-power transfers on the tie-line between Ireland and Northern Ireland. The frequency response provided by PPMs assists in managing any high frequency condition that will arise in the event of an interconnector or tie-line tripping.
- When there are frequency oscillations on the power system, or the frequency is difficult to regulate. The frequency response of PPMs assists in damping these oscillations and regulating the frequency.
- During trials of new system operating conditions such as the increase to the Rate of Change of Frequency (RoCoF) limit. The frequency response provided by PPMs provides additional system resilience.
- When the Control Centre stability assessment tool indicates unacceptable high frequency zeniths.
- All the groups may be turned on if system conditions dictate or to support trialling of new operating conditions.

Normally we enable only three of the six APC groups at a time to limit the impact on PPM production. The 'odd' APC groups (1,3 and 5) may be enabled during 'odd' weeks[1]. The 'even' groups (2,4 and 6) may be enabled during 'even' weeks.

1 Week numbers per ISO Week Date Standard (ISO 8601), all weeks starting Monday, ending Sunday.

Appendix 1 - APC Groups

Below are the PPMs (their three-letter code and MW capacity) in each of the six APC groups (with total MW capacity of each group summated).

Group 1		613
Athea	AH1	34.34
Ballincollig	BH1	13.23
Ballybane 1	BA1	27.95
Ballymartin 1	BX1	6.00
Bawnmore	BN1	24.00
Boggeragh 1	BG1	57.00
Boolynagleragh	BJ1	37.01
Bunnyconnellan	GJ1	27.57
Carrickallen	AL1	20.60
Carrigdangan	XA1	55.00
Cordal 2	DL2	54.00
Davidstown Solar	WR1	5.01
Gallanstown	IA01	119.00
Lisheen 2	LS2	23.00
Lurrig Solar	ND1	4.00
Uggool Seecon	SO1	105.00

Group 2		580
An Cnoc	AC1	11.50
Blundelstown	NA1	60.00
Boggeragh 2	BG2	65.70
Bruckana	BU1	39.60
Cappawhite B	CP3	13.20
Clahane 1	CJ1	37.80
Cloghboola	CL1	46.00
Cloghervaddy	YV3	10.80
Grousemount	GD1	115
Cronelea 1	CC1	4.60
Curraghmartin	WF1	4.00
Derrynadivva Extension	MX3	6.80
Killala	KF1	19.20
Knockawarriga 2	KW2	6.60
Knocknagoum	KM1	44.36
Lissycasey	LY1	13.40
Meenwaun	MW1	9.99
Painstown Hill	PT1	7.00
Scartaglen	ST1	41.00
Tullynamoyle	KD1	9.2
Tullynamoyle 3	TM3	13.50

Group 3		702
Blusheens	JA1	8.00
Cahermurphy	XM1	6.00
Cappawhite A	CP1	52.00
Carrickeeny	CF1	7.65
Carrowleagh	XR1	35.00
Castlepook	PO1	33.10
Cronalaght 2	YC2	18.00
Foyle	FY1	9.20
Gibbet Hill	GT1	14.80
Glanaruddery 2	DA2	12.00
Kilbranish 1	KR1	2.50
Kilcumber	OE1	75.60
Knockaneden	KO1	9.20
Leitir Guingaid	LG1	40.90
Lenalea	LL1	30.10
Lisdowney	LW1	9.50
Lisheen 1	LS1	36.00
Mauricetown	MR1	13.80
Monaincha Bog	MH1	36.00
Mountlucas	MO1	79.20
Raragh 2	RR2	11.50
Scartaglen 2	ST2	5.00
Sorrell Island 2	SF2	8.00
Derrinlough	DN1	126.00
Beenanaspuck and Tobertoreen	XT1	23.10

Group 4		602
Ballybay	BS1	13.80
Ballymacadam	YM1	21.00
Ballymartin 2	BX2	8.00
Beaulieu Solar	BEAU	4.00
Coollegrean	OG1	18.50
Cloghan	NC1	37.80
Derrynadivva	MX2	8.00
Dromlour	JB1	5.00
Glanaruddery 1	DA1	20.00
Glanthaunyalkeen 1	GC1	10.00
Glencarbry	GY1	33.00
Gorey	OB1	5.00
Harlockstown	IA2	32.00
Killin Hill	KL1	6.00
Leanamore	LM1	20.70
Lisheen 3	LS3	28.80
Macallian Solar	NS1	9.00
Meenaward	MI1	6.90
Mulreavy 1	MB1	89.00
Raheenleagh	RL1	36.50
Sheskin	SS1	18.00
Sliabh Bawn	SB1	58.00
Srahnakilly	OY1	90.20
Teevurcher	TV1	9.00
Tullabrack	TK1	13.80

Group 5		655
Ballybane 2	**BA2**	13.05
Ballycumber	**YR1**	18.00
Black Lough	**XL1**	12.50
Booltiagh Ext	**BT2**	12.00
Cloghaneleskirt	**KI1**	12.00
Coolyduff	OH1	5.00
Cronelea 2	**CC2**	4.60
Crossfield	OF1	5.00
Derrysallagh	**DS1**	32.00
Dromdeeveen	**DV1**	27.00
Esk	**ES1**	23.20
Faughary	**FU1**	6.00
Garraneragh	**GG1**	8.75
Grove Hill	**GR1**	16.10
Hollyford	**HY1**	9.00
Kelwin 1	**KZ1**	37.05
Kill Hill	**KH1**	36.00
Knockacummer	**KC1**	100.00
Knockalour	**KA1**	8.95
Lysaghtstown	LO1	87.00
Millvale North Solar	**JD1**	8.00
Rosspile Solar	**RO1**	95.00
Boolinrudda	RD1	45.00
Sorrell Island 1	**SF1**	24.00

Group 6		564
Ballybane 3	LM1	4.45
Barranafaddock	BS1	32.40
Clahane 2	BX2	13.80
Cleanrath	NC1	42.64
Clogheravaddy 1	OG1	9.20
Clogheravaddy 2	DA1	10.80
Cordal 1	GC1	35.85
Glenough	GU1	32.50
Derrybrien	GY1	59.50
Gillinstown	NB1	95.00
Killaveenoge	MI1	24.80
Knocknatallig	KQ1	18.30
Knockalough	MB1	33.60
Lehinchs	QL1	4.50
Moneypoint WF	MP9	17.25
Mulreavy 2	RL1	5.40
Spaddan	SB1	17.50
Taghart	TV1	23.10
Uggool	TK1	64.00
Woodhouse	WS1	20.00