

# Active Power Control Groups

19 June 2020



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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.

Currently APC is only applied to wind farms in Ireland. Due to differing Grid code requirements, wind farms in Northern Ireland do not currently provide this capability. No solar is currently included in this scheme.

This document provides an overview of APC and presents the currently defined APC groups.

We intend to update this document on an annual basis. For any queries or comments related to this document please contact [info@eirgrid.com](mailto:info@eirgrid.com) or [info@soni.ltd.uk](mailto:info@soni.ltd.uk).

## 2 ACTIVE POWER CONTROL

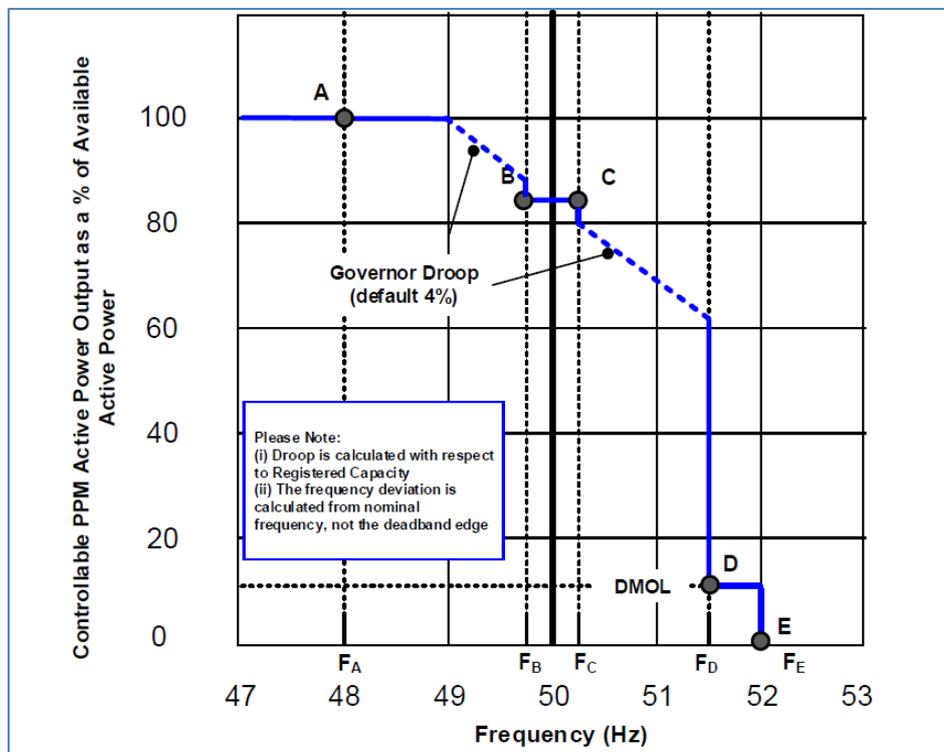
### FREQUENCY DEADBAND

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)

## 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 in order 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.

## TURNING APC ON/OFF

In order to manage the collective frequency response of PPMS, we selectively 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 normally off but is tuned 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 N.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. The frequency response of PPMS assist in damping these oscillations.
- 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.

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<sup>1</sup>. The 'even' groups (2,4 and 6) may be enabled during 'even' weeks. However, all the groups may be turned on if system conditions dictate or to support trialling of new operating conditions.

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<sup>1</sup> 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).

<b>Group 1</b>			<b>Group 2</b>			<b>Group 3</b>		
<b>396</b>			<b>393</b>			<b>403</b>		
Athea	AH1	34	An Conc	AC1	12	Cappawhite	CAP	52
Ballincollog	BH1	13	Boggeragh	BG2	66	Foyle	FOY	9
ballybane	BA1	28	Bruckana	BU1	40	Leitir Guingaid	LG1	41
Ballymartin	BX1	6	Clahane	CJ1	38	Lisdowney	LW1	10
UGGOOL Seecon	SEE	105	Cloghboola	CL1	46	Lisheen	LS1	36
Boggeragh	BG1	57	Cronelea	CC1	5	Monaincha Bog	MH1	36
Lisheen	LS2	23	Tullynamoyle	TM3	14	Mountlucas	MO1	79
Cordal 2	DL2	54	Knocknagoum	KM1	44	Gibbet Hill	GT1	15
Bawnmore	BN1	24	Scartaglen 1	ST1	34	Castlepook	PO1	33
Carrickallen	AL1	15	Cappawhite B	CP3	13	Glanaruddery 2	DA2	12
Booynagleragh	TG3	36.98	Meenwaun	MW1	10	Carrickeeny	CF1	8
			Killala	KF1	17	Knockaneden	KO1	9
			Lissycasey	LY1	13.4	Scartaglen 2	ST2	5
			Derrynadivva Ext	MX3	6.8	Kilbranish WF	KR1	2.5
			Knockalassa*	KD1	27	Carrowleagh Ext		2.7
			Knockawarriga 2*	KW2	6.6	Cronalaght 2		18
						Raragh 2	RR2	11.5
						Beenanaspuck & Tob.	XT1	23.15
<b>Group 4</b>			<b>Group 5</b>			<b>Group 6</b>		
<b>439</b>			<b>420</b>			<b>430</b>		
Ballybay	BAL	14	Ballybane	BA2	13	Ballybane	BA3	4
Ballymartin	BX2	8	Cronelea	CC2	5	Killaveenoge	KV1	25
Derrynadivva (Raheen B)	MX2	8	Faughary	FU1	6	Moneypn1	MON	17
Kilnhill	KL1	6	Garraneragh	GG1	9	Mulreavy	MB2	5
Mulreavy	MB1	90	Grove Hill	GR1	16	Barranafaddock	BF1	32
Raheenleagh	RL1	37	Hollyford	HY1	9	Spaddan	SP1	18
Sliabh Bawn	SB1	58	Kill Hill	KH1	36	Uggool	UGC	64
Tullabrack WF	TK1	14	Knockacummer	KC1	100	Woodhouse	WS1	20
Leanmore	LM1	18	Knockalour	KA1	9	Cordal 1	DL1	35
Glencarbry	GY1	33	Boolinrudda	RD1	45	Derrybrien	DY1	60
Glanaruddery 1	DA1	20	Kelwin 1	KZ1	37	Glenough	GU1	33
Coollegrean	OG1	18	Dromdeeveen	DV1	27	Knockatallig	KQ1	18
Glantaunyalkeen 1	GC1	10	Cloghaneleskirt	KI1	12	Clahane 2	CJ2	14
Teevurcher	TV1	9	Booltiagh 2	BT2	12	Knockalough	KU1	33.6
Meenaward	MI1	7	Tullynamoyle 2	TM2	10	Clogheravaddy	YV1	9.2
Oweninny*	OY1	89	Ballycumber	YR1	18	Cleanrath*	YT1	42.64
			Sorrell Island	TG7	24			
			Derrysallagh	DS1	32			

\* In process of being added to these groups in June 2020.