

Annex 10

RfG System Management Requirements

	Articles	TO	SO	DNO	Comments
1	Power Generating Module Type A System Management Requirements Automatic Reconnection - (Article 13(7))	NA	All parties who are required to meet the requirements of the Grid Code (except LEEMPS) will be reconnected by NG instruction (automatic reconnection will not be permitted). As a minimum this would require the Generator to be within the frequency range of 47 – 52 Hz and statutory voltage limits. The ramp rate limits will be as per BC1.A.1.1.	G59 specifies this and will be carried forward into G99	<p>GC BC.2.5.2 Re-synchronisation is permitted under GB Code in limited circumstances, such as where an instruction is given by NGET.</p> <p>G59 already has this requirement.</p> <p>There is a concern how parties who don't have to meet the requirements of BC1 and BC2 will satisfy these requirements (e.g. LEEMPS). Because of this, LEEMPS will need to be changed.</p> <p>There is a wider concern on the system as a result of the high volumes of embedded generation. This is likely to require further work in the future as part of a GB specific workgroup</p>
2	Power Generating Module Type B System Management Requirements (Automatic reconnection after system disturbance / Control Schemes) (Article 14(4) and Article 14(5))	NA	Same as item 1 above	G59 specifies this. G99 will apply current approach going forward for A to C, not D.	<p>See item 1 above.</p> <p>Requirements for automatic reconnection systems and the connection conditions required following disconnection after a system disturbance (if required) would be specified in the Bilateral Agreement if necessary for System reasons.</p> <p>Wider concern of implication on the system as a result of the high volumes of embedded generation. This is likely to require further work in the future as part of a GB specific workgroup</p>

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3	Power Generating Module Type B System Management Requirements Protection (1) – Article 14(5)(b)(i) and (ii)	TO's will have to specify the schemes and settings for directly connected Generation if different from current GB practice. TO's to check RES and commissioning documentation	High level requirements are captured in the Grid Code (CC.6.2.2.2). The Grid Code legal drafting proposed under the ECC's has however been updated to ensure consistency with RfG. Any site specific requirements as referred to in the Grid Code and RfG e.g as agreed between the Generator and NGET/Transmission Licensee would be covered in the Bilateral Agreement.	Provisions in DPC4.4.4. and DPC 7.4.3 are generally the same as required in the RfG	CC.6.2.2.2 Specified in Bilateral Connection Agreement and also covered as part of the Commissioning Process TP106. Further checks required against commissioning documentation and RES. DNO's / TO's need to be aware of potential changes to their standards.
4	Power Generating Module Type B System Management Requirements Protection (2) - (Article 14(5)(b)(iii))	TO's will have to specify the schemes and settings for directly connected Generation if different from current GB practice	Grid Code text under the proposed ECC's has been updated to reflect these issues and ensure consistency with RfG.	Provisions in DPC4.4.4. and DPC 7.4.3 are generally the same as required in the RfG	As per item 3 above
5	Power Generating Module Type B System Management Requirements Protection (3) - (Article 14(5)(b)(iv) and 14(c))	Any changes to protection settings will need to be agreed with the TO for transmission connection	Issues relating to protection changes are currently covered under the Bilateral Agreement. Additional text has been added into the proposed ECC's to ensure consistency with the RfG.	Any changes to protection settings will need to be agreed with the DNO for distribution connection	As per item 4 above
6	Power Generating Module Type B System Management Requirements Operational Metering - (Article 14(5)(d) (i) and (ii))	Same as current GB practice for Generators currently caught by the requirements of the Grid Code.	CC.6.5.6 of the Grid Code requires operational metering with the exact signals and communications requirements being captured under the Bilateral Agreement.	DNOs will have to specify this for D connected Type B to D.	For Generators which have a connection agreement with National Grid SO (i.e. are CUSC Parties or LEEMPS) then there is a mechanism for National Grid SO to receive the operational metering data required. However it is unclear how operational metering data for Non CUSC parties (excluding LEEMPS) would be obtained.

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7	Power Generating Module Type C System Management Requirements FSM Monitoring– Article 15(2)(g)	FSM – Monitoring Electrical Standards documents to be updated by the relevant TO TS.3.24.95_RES.	The proposed ECC's have been updated to include FSM Monitoring. TS.3.24.95_RES will also need to be updated to ensure consistency with RfG.	Dependent on TSOG Art 50 plus DNOs' own requirements (if any).	Monitoring: OC.5.4.1(C) Specified in Bilateral Agreement and RES (TS.3.24.95_RES). Changes will be required to the RES.
8	Power Generating Module Type C System Management Requirements - Automatic Disconnection at specified voltages - Article 15(3)	NA	The SO needs to coordinate with the relevant system operator in the specification when automatic disconnection will take place.	DNOs will not use this save for the equivalence with the over and under voltage protection in G99.	For CUSC Parties, the current Grid Code does not permit automatic disconnection at specified voltages other than in respect of the fault ride through requirements. It is proposed to remove clause CC.6.3.15.3(iv) for new connections in Scotland to ensure consistency with England and Wales.
9	Power Generating Module Type C System Management Requirements Robustness Article 15(4)(a) – (c)	NA	Same as current GB practice. No change required	To be reflected in D Code/G99	Stability and connection during disturbances and during auto reclosures covered under CC.6.3.10 and CC.6.3.15.
10	Power Generating Module Type C System Management Requirements 15(6)(a)	TO to consider in coordination with the SO and may have to specify the requirements if required	Specified through bi-lateral agreement if required by SO for System reasons	NG needs to decide what to do about this. Or stay with current D Code drafting DPC7.4.2.1 & DPC7.4.5	CC.6.2.2.3.4 Pole Slipping Protection is covered in the Grid Code will be specified in the Bilateral Agreement if required
11	Power Generating Module Type C System Management Requirements Monitoring (Article 15(6)(b)(i) - (iv)	Electrical Standards documents to be updated by the relevant TO eg TS.3.24.70 (Dynamic System Monitoring)	ECC's have been updated to reflect this change and ensure consistency with RfG.	DNO's need to consider and specify this requirement	CC6.6, OC5.4.1, RES, Many of these issues (e.g. DSM, Power Quality Monitoring and Fault recording are covered under the Grid Code, Bilateral Agreement or RES. The ECC's have been updated to reflect these requirements to ensure consistency with RfG.
12	Power Generating Module Type C System Management	NA	Planning Code to be updated to ensure consistency with RfG. In	NA	There are some minor issues such as model validation isn't proven until the end of the test

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	Requirements Simulation / Models (1) (Article 15(6)(c)(i) and (ii))		general any changes are believed to be minor.		results, which could be an issue for new types of plant or the need for Electromagnetic time domain analysis.
13	Power Generating Module Type C System Management Requirements Simulation / Other Issues (2) (Article 15(6)(c)(iii),(d),(e) and (f))	NA	No change to the current requirements	DNOs and SO requirement to be the same as far as possible	15(6)(c) as above 15(6)(d) Not explicitly covered in the Grid Code but would be covered as part of the Bilateral Agreement 15(6)(e) - BC1.A.1.1 - Ramp Rate limits are currently specified in the Grid Code but apply on a BMU basis rather than a Power Generating Module basis – see also item 1 above. 15(6)(f) Already covered under CC.6.3.11 – No conflict with RfG.
14	Power Generating Module Type D System Management Requirements Synchronising (Article 16(4))	Electrical Standards documents to be updated by the relevant TO – TS.3.24.60_RES	The ECC's have been updated to include a section on Synchronising. TS.3.24.60_RES will require updating.	DNOs and SO requirement to be the same as far as possible.	Bilateral Agreement / TS.3.24.60_RES Checks required to ensure TS.3.24.60_RES is consistent with the EU requirements
15	Type D Synchronous Power Generating Modules and Type C PPM's Angular Stability under fault conditions / POD (Art 19(3) / Art 21(3)(f)) Other Issues	NA	Specified under Grid Code and Bilateral Connection Agreement if required for System reasons. This follows current GB practice and is not believed to cause any conflict with RfG.	Current D Code drafting DPC7.4.2.1 & DPC7.4.5	19(3) Covered under CC.6.3.15 and CC.A.6 21(3)(f) – Covered in CC.A.7.2.4 and the Bilateral Connection Agreement.
16	Derogations / Emerging Technology	NA	NA	NA	Not specified – discussion required.