Supporting document to the GB Synchronous Area Operational Agreement developed in accordance with Article 118 of Commission Regulation (EU) 2017/1485 of 2 August 2017 establishing a guideline on electricity transmission system operation

05.04.2018

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| **Disclaimer**This explanatory document is provided by NGET for information purposes only and accompanying the draft for stakeholder consultation of NGET proposal for the GB Synchronous Area Operational Agreements document in accordance with Article 118 of Commission Regulation (EU) 2017/1485 of 2 August 2017 establishing a guideline on electricity transmission system. |

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# Introduction

1. The Commission Regulation (EU) 2017/1485 of 2 August 2017 establishing a guideline on electricity transmission system operation (hereafter "**SOGL**") was published in the official Journal of the European Union on 25 August 2017 and entered into force on 14 September 2017. The SOGL sets out guidelines regarding requirements and principles concerning operational security, as well as the rules for determining common load-frequency control processes and control structures and to maintaining a frequency quality level of the synchronous area.
2. Article 118 of SOGL requires the development of Synchronous Area Operational Agreements (hereafter "**SAOA**") for Great Britain by 12 months after entry into force. Those elements of the SAOA also referenced in Article 6(3) of the SOGL are subject to public consultation in accordance with Article 11 of the SOGL, prior to NRA approval.
3. The supporting document has been developed in recognition of the fact that the SAOA, which will become a legally binding document after NRAs' approval, inevitably cannot provide the level of explanation, which some parties may desire. Therefore, this document aims to provide interested parties with greater descriptive information and explanation of the methodology text contained in the SAOA.

# General information about the Synchronous Area Operational Agreements and the document for GB

## Subject matter and scope

1. The Synchronous Area Operational Agreement (SAOA) for Great Britain contains:
	1. Title 2: Those Articles referenced in both 118 and 6(3). These are subject to OFGEM approval and public consultation from Article 11.
	2. Title 3: Those Articles referenced in Article 118 but not found in Article 6 or 11. These Articles are not subject to either OFGEM approval or public consultation.

## Governance and implementation within GB

1. OFGEM is the sole competent National Regulatory Authority (NRA) for the SAOA of Great Britain.
2. OFGEM determined in the GB TSO responsibility mapping document, that Article 118 is the sole responsibility of the electricity system operator, NGET, in GB to draft.
3. The SOGL determines that there are two paths for approvals in the SAOA (Article 118):
	1. Those agreements from SOGL Article 118 developed by NGET for GB which are referenced in SOGL Article 6(3) concerning NRA approval are subject to a public consultation from SOGL Article 11 and then NRA (OFGEM) approval. These are contained in Title 2 of the SAOA document (see the next section for a list);
	2. Those agreements from SOGL Article 118 not requiring OFGEM approval or public consultation will be drafted by NGET. These agreements are found in Title 3 of the SAOA document.
	3. The SAOA document will be published at the end of the drafting and approval process according to Articles 183, 184 on the ENTSO-E website.
4. Whilst the SAOA includes agreements specific to the security considerations of exchanged and shared services via HVDC interconnectors with other synchronous areas, these agreements only consider the GB implications on security and effective operation of the Load Frequency Control Structure and not the needs of other synchronous areas. When those agreements, relative to the exchange and sharing of reserves between synchronous areas, are subsequently drafted the rules and limits will need to consider the combined effect of the obligations and limitations of all agreements of all the relevant SAOAs.

## Methodologies from Article 118 that are subject to National Regulatory Authority (OFGEM) approval.

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|  | Methodologies, conditions and values included in the SAOA in SOGL Article 118 referenced in Article 6(3) thus requiring OFGEM approval:

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| SOGL Article ref | SOGL Article 118 text |
| 118(a); 6(d)(ii) | the dimensioning rules for FCR in accordance with Article 153 |
| 118(b); 6(d)(iii) | the additional properties of the FCR in accordance with Article 154(2); |
| 118(c); 6(d)(i) | the frequency quality defining parameters and the frequency quality target parameter in accordance with Article 127; |
| 118(m); 6(d)(iv) | for the GB and IE/NI synchronous areas, the measures to ensure the recovery of energy reservoirs in accordance with Article 156(6)(b); |
| 118(t); 6(d)(vii) | for synchronous areas other than CE and if applicable, the limits for the exchange of FCR between TSOs in accordance with Article 163(2); |
| 118(x); 6(d)(viii) | for the GB and IE/NI synchronous areas, the methodology to determine the minimum provision of reserve capacity on FCR between synchronous areas, defined in accordance with Article 174(2)(b); |
| 118(z); 6(d)(ix) | limits on the amount of exchange of FRR between synchronous areas defined in accordance with Article 176(1) and limits on the amount of sharing of FRR between synchronous areas defined in accordance with Article 177(1); |
| 118(aa); 6(d)(x) | limits on the amount of exchange of RR between synchronous areas defined in accordance with Article 178(1) and limits on the amount of sharing of RR between synchronous areas defined in accordance with Article 179(1); |

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## Timeline for the initial SAOA development process

1. According to SOGL Article 118(1), the agreement text drafting must be completed and submitted to the NRA by SOGL EIF+12months, 14th September 2018;
2. For those Articles referenced in SOGL Article 6(3), SOGL Article 11 states that these must also undergo a public consultation which must be open for at least 1 month (to be conducted from 5th April to 18th May 2018 for GB);
3. SOGL 6(7) states that the NRA will take no longer than 6 months to issue its decision on the TSO proposed SAOA text. (SOGL EIF+18months);
4. SOGL Article 118(2) specifies that the TSO must conclude any required revisions to the SAOA by 1 month after the NRA has issued its opinion on the document (SOGL EIF+19months);
5. SOGL Article 184 specifies that the SAOA must be notified to the NRA or where applicable other relevant NRAs no later than 1 month before the SAOA enters into force (SOGL EIF+20months) ;
6. SOGL Article 118(2) specifies that the SAOA will enter into force no later than 3-months after the proposed text has been approved by the NRA (SOGL EIF+21months);
7. SOGL Article 184 specifies that the SAOA must be provided to ENTSO-E for publication no later than 1-week after its entry into force;

## Revisions to the SAOA for GB

1. The process of changing these agreements depends on whether they are subject to NRA approval or not.
	1. Those items in Title 2 of the SAOA requiring OFGEM approval, for which a revision is desired, require review by the NRA according to SOGL Article 7.
	2. Those items in Title 3 of the SAOA not requiring OFGEM approval, for which a revision is desired, will be amended and published by NGET.

# TITLE 2 - Explanatory text to accompany each agreement Article in the SAOA document that is subject to NRA approval

## SAOA Article 3 - SOGL Article 118(a) - “the dimensioning rules for FCR in accordance with Article 153;”

1. Frequency Containment Reserves [FCR] are needed to:
	1. resist the initial magnitude and rate of change of frequency following a secured event of a loss of infeed or demand to maintain frequency standards as defined in NETS SQSS.
	2. manage the imbalance of generation and demand in real time including market imbalance and the ramping of generators and interconnectors.
2. NGET must ensure that there is the right level of FCR procured to meet the time varying requirement. NGET determines in advance the FCR requirement across the range of potential system conditions using statistical and mathematical models which are regularly reviewed. Using this predetermined range of requirements the ENCC study the prevalent system conditions and select the relevant requirement. This is then regularly updated to reflect changes in system conditions and drivers all the way through to real time.
3. FCR requirements vary according to; system demand, system inertia, the largest potential loss of infeed & demand and prevailing system conditions. Network connectivity, congestion and inherent risks and limitations of assets may also warrant NGET adjusting the total holding, location and distribution of holding of FCR amongst service providers.
4. A baseline of Balancing Services for FCR is procured ahead of real time where they can demonstrate an expected cost saving against mandatory services. This includes the monthly tenders for dynamic and static Firm Frequency Response (FFR), and other optional contracts.
5. As we approach real time, NGET makes an assessment on the basis of system operability and economics of the appropriate balance between actively managing the magnitude of credible losses of infeed and demand, the amount of system inertia and the requirement for FCR.

## SAOA Article 4 - SOGL Article 118(b) - “additional properties of FCR in accordance with Article 154(2);”

1. There are no additional properties of FCR defined for GB as it is more advantageous for GB to maintain requirements at a specific service level.
2. SOGL has an architecture of reserve categories with the concept of Minimum [common] Technical Requirements which all reserve services mapped into the FCR category must fulfil. SOGL introduces the concept of Minimum Technical Requirements within each Synchronous Area to facilitate the coordination of control and interoperability of services defined by multiple TSOs. This methodology permits the electricity system operators of the synchronous area to agree on common additional properties for all relevant FCR services in use within the same Synchronous Area. However, in the specific GB application, where there is only one LFC Block and one electricity system operator, it makes more sense to keep these additional properties to a minimum. This permits the maximum possible flexibility at an individual service level as today. This flexibility provides the full range of control needs of the SO. Furthermore, this approach is also more adaptable to the evolution in system requirements and technological capability changes needed as new controllable producers, consumers and storage become available and as markets and control architectures evolve.

## SAOA Article 5 - SOGL Article 118(c) - “the frequency quality defining parameters and the frequency quality target parameters in accordance with Article 127;”

1. The Frequency Quality defining parameters and frequency quality target parameters for GB are found in Appendices III and IV of the SOGL text (as per below), and aligned with regulatory parameters also found in the NETS SQSS.

ANNEX III

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| **Frequency quality defining parameters referred to in Article 127:**  | **GB**  |
| standard frequency range  | ±200 mHz |
| maximum instantaneous frequency deviation  | 800 mHz |
| maximum Steady-state frequency deviation  | 500 mHz |
| time to recover frequency  | 1 minute |
| Frequency Recovery Range  | ±500 mHz |
| time to restore frequency  | 15 minutes |
| frequency restoration range  | ±200 mHz |
| alert state trigger time  | 10 minutes |

Table 1 Frequency quality defining parameters of the GB synchronous area

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| Frequency quality target parameters referred to in Article 127.  | **GB**  |
| maximum number of minutes outside the standard frequency range  | 15000 |

Table 2 Frequency quality target parameters of the GB synchronous area

ANNEX IV

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| FRCE target parameters referred to in Article 128:  | **GB** |
| Level 1 (200mHz deviation)  | 3 % of measurements in the reporting time-period |
| Level 2 (500mHz deviation) | 1 % of measurements in the reporting time-period |

Table 1 Frequency Restoration Control Error target parameters for the GB synchronous area

## SAOA Article 6 - SOGL Article 118(m) - “for the GB and IE/NI synchronous areas, measures to ensure the recovery of energy reservoirs in accordance with to Article 156(6)(b);”

1. Energy reservoirs are managed by the FCR service provider and the current framework allows them to do this.
2. For new services and changes to existing services, NGET works with the industry to ensure that service design allows for the service provider to manage energy reservoirs and so minimise the risk of depletion. In unforeseen circumstances a provider would communicate a depletion of the service to us. NGET will replace the depleted service with an equivalent while the energy reservoir is in recovery.
3. In procuring against our requirement NGET takes into account the potential unavailability, caused by factors such as breakdown or depletion of energy reservoirs, to ensure there is sufficient FCR to ensure operational security.

## SAOA Article 7 – SOGL Article 118(t) – “if applicable, for synchronous areas other than CE, limits for the exchange of FCR between the TSOs in accordance with Article 163(2);”

1. This Article does not apply in GB because of the LFC Block structure where there is a single TSO with the responsibility of being the GB electricity system operator for a single LFC Area that is contiguous with the LFC Block and Synchronous Area.

## SAOA Article 8 - SOGL Article 118(x) - “the methodology to determine limits on the amount of sharing of FCR between synchronous areas defined in accordance with Article 174(2);”

1. The amount of reserves that can be shared or exchanged between the GB synchronous area and other synchronous areas is inherently limited by the technical limits of the interconnector(s); and constraints on the internal AC networks.
2. If FCR is being delivered across one of the interconnectors and at that time the interconnector is also NGET’s largest infeed or demand loss the system may not be secure for the event. NGET would need to ensure there is sufficient FCR being provided by other sources.
3. When NGET assesses the receipt of an exchange or sharing of FCR, offers will be deemed non deliverable where congestion prevents delivery or where delivery would cause system security problems.
4. These system security parameters are monitored continuously by NGET.

## SAOA Article 9 - SOGL Article 118(z) - “the methodology to determine limits on the amount of exchange of FRR between synchronous areas defined in accordance with Article 176(1) and the methodology to determine limits on the amount of sharing of FRR between synchronous areas defined in accordance with Article 177(1); and”

1. The amount of reserves that can be shared or exchanged between the GB synchronous area and other synchronous areas is inherently limited by the technical limits of the interconnector(s); and constraints on the internal AC networks.
2. When NGET assesses the receipt of an exchange or sharing of FRR, offers will be deemed non deliverable where congestion prevents delivery or where delivery would cause system security problems.
3. These system security parameters are monitored continuously by NGET.

## SAOA Article 10 - SOGL Article 118(aa) - “the methodology to determine limits on the amount of exchange of RR between synchronous areas defined in accordance with Article 178(1) and the methodology to determine limits on the amount of sharing of RR between synchronous areas defined in accordance with Article 179(1).”

1. The amount of reserves that can be shared or exchanged between the GB synchronous area and other synchronous areas is inherently limited by the technical limits of the interconnector(s); and constraints on the internal AC networks.
2. When NGET assesses the receipt of an exchange or sharing of RR, offers will be deemed non deliverable where congestion prevents delivery or where delivery would cause system security problems.
3. These system security parameters are monitored continuously by NGET.

# TITLE 3 - Explanatory text to accompany each Article in the SAOA document that is not subject to NRA approval

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| *Placeholder / Notice: The remaining explanatory statements relating to the SAOA Articles will be inserted in this section prior to completion of this document by September 2018.*  |