

# Convenor’s Note regarding the compromise proposal by SAFA Drafting Team on A-2 Centralized Control of FCR

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## 1. Background

The Article A-2/POLICY ON LFC&R of the SAFA establishes a common proposal developed by all TSOs of SA CE regarding additional requirements for FCR in accordance with Article 154(2) of SO GL. One of these additional requirements treated in Article A-2 deals with the rules regarding centralized control of FCR units or groups. Since a common decision on this matter could not be elaborated by the project team the RG CE plenary has been asked for guidance by providing their preferences on different options that have been proposed by the drafting team. In particular these options consisted of the subsequent requirements:

- The geographical limit of frequency measurement
  - Per 110 kV connection point
  - Per TSO (minimum number of frequency measurement points)
- Full Redundancy of communication channels
  - Required
  - Not required

## 2. Guidance from RG CE plenary

The following table has been elaborated based on the comments which have been issued during the request for guidance. It shall serve as an overview of the different TSO positions. The transcription of the detailed feedback into this table might be misleading, hence the original feedback can be found in the end of this document.

TSO	Option			
	Geographical limit of frequency measurement		Full redundancy of communication channels	
	Per 110 kV connection point	Minimum number of measurement points per TSO	Required	Not Required
PSE	x		x	
MAVIR		x	x	
ESO	-	-	-	-
TTG	(x)	(x)	x	
TNG	x		x	

<b>ELIA</b>		<b>x</b>	<b>(x)</b>	<b>(x)</b>
<b>RTE</b>		<b>(x)</b>	<b>(x)</b>	<b>(x)</b>
<b>EN</b>		<b>x</b>		<b>x</b>
<b>SG</b>		<b>x</b>		<b>x</b>
<b>TERNA</b>	<b>x</b>		<b>x</b>	
<b>Amprion*</b>	<b>(x)</b>	<b>(x)</b>	<b>x</b>	
<b>APG*</b>	<b>(x)</b>	<b>(x)</b>	<b>x</b>	
<b>CEPS*</b>	<b>x</b>		<b>x</b>	

Amprion's, APG's as well as CEPS' position were not part of the commenting phase but have been added to the table based on the feedback within the drafting team (marked with \*). Brackets shall indicate that the TSOs position could not be clearly allocated to either one of the proposed options. "-" indicates that neither of the options is appropriate.

In summary, the preferences with regards to the geographical location of frequency measurement points were quite balanced, whereas the positions supporting fully redundant communication channels seem prevail. To avoid a crucial vote the drafting team elaborated on a compromise solution to consider each party's preferences to the extent possible.

### **3. Development of a compromise proposal**

The discussion within the DT on 8<sup>th</sup> of August 2018 in Warsaw yielded fruitful results. Some TSOs were very open-minded for centralized control of FCR providing groups, whereas others preferred a fully decentralized solution or expressed the preference to prohibit centralized control entirely. After a longer discussion the two following principles were unilaterally agreed.

- FCR units or groups shall preferably use the local frequency at its connection point.
- Centralized control shall be allowed if a fully decentralized fallback procedure (i.e. the use of a local frequency measurements in disturbed operation) is implemented.

The DT elaborated that in case a fully decentralized fallback is implemented fully redundant communication channels are dispensable. A centralized control with a fully decentralized fallback procedure without exceptions could however also not be agreed unanimously as sole solution.

By this the question was narrowed down to whether centralized FCR without a fully decentral fallback mechanism is admissible with full-redundancy of communication channels only. RTE, ELIA and Swissgrid preferred the admission of centralized control without decentralized fallback while limiting the risk by e.g. applying the 150MW-rule (5% of FCR dimensioning of RG CE).

The following approach was chosen in order to come to a compromise.

- Only if the provider is able to provide evidence that a decentralized solution cannot be implemented with adequate effort, the provider is entitled to use centralized control and central frequency measurement even without a decentralized fallback mechanism.

- Additional security limits need to be established to ensure that at no time more than 150MW (requirement derived from SO GL Art. 156(6a)) of FCR capacity is lost due to an error, outage or fault (e.g. system split, failure FCR components or loss of communications channels).

#### 4. Comparison of compromise proposal and the version issued for public consultation

The original formulation issued for the public consultation in April 2018 as well as the revised formulation for the RG CE plenary voting can be found here.

##### Previous formulation issued for public consultation

4. Where centralized control of FCR providing units or FCR providing groups is applied each TSO shall ensure, that in case of regional disturbances, system split or communication problems separate frequency measurements for every geographical area behind a connection point to the voltage level of 110 kV and above are used and the autonomous activation of FCR is still possible.

##### New formulation (compromise solution)

4. FCR providing units or groups shall in general base FCR activation on local frequency measurement to ensure the autonomous FCR provision.

5. Central control of FCR providing groups shall be allowed if a fully decentralized fallback procedure (incl. local frequency measurement for each connection point, see Figure 1) is ensuring an autonomous function and a proper activation in case of errors of the central control (e.g. outage of SCADA, faults of communication lines) or system split of the electrical grid. An observation function shall detect any kind of errors of the central control or frequency deviations among the technical entities. The FCR provider shall initiate appropriate counter-measures immediately to ensure the FCR provision is not significantly negatively impacted in comparison to a fully decentralized solution. In line with Article 156(6a) a single centralized FCR controller shall not control more than 150 MW of FCR.

5. In case no decentralized fallback procedure according to 5. can be implemented within a FCR providing group a centralized control of FCR providing groups is allowed to be implemented under the following preconditions:

The Provider shall provide evidence to the connecting TSO that a decentralized fallback procedure according to 5 cannot be implemented with adequate efforts

The TSOs operating in a Monitoring Area according to A-7 Determination of LFC Blocks shall delimit its Monitoring Area into  $n_{FMP}$  sub-areas, whereas  $n_{FMP}$  shall be at least the the total allowed FCR provision according to SO GL ANNEX VI ( $FCR_{max}$ ) of the operating TSOs in that Monitoring Area divided by 150 MW ( $n_{FMP,min} = \frac{\sum FRC_{max}}{150 \text{ MW}}$ ) or a higher number defined by the operating TSOs. The value obtained by the formula is to be rounded up. In each of these sub-areas at least one frequency measurement point has to be established by a FCR provider in that area

In line with Article 156(6a) a single centralized FCR controller shall not control more than 150 MW of FCR.

The TSOs shall observe the share of FCR provided in this way in order to consider an outage of a telecommunication provider contracted by several FCR providers and shall take action to limit the total amount per LFC block to 150 MW.

## 5. Original feedback received by RG CE members

### TNG

Langbecker Jens [J.Langbecker@transnetbw.de](mailto:J.Langbecker@transnetbw.de) / 20.07.2018 17:46

I like to give the following „guidance“ for TransnetBW:

- **I. Geographical distribution:** At least 1 measurement per connection point and galvanically separated grid area; AND max. 150 MW  
(Option a)
  
- **II. Redundancy of communication:** Full Redundancy of BSP components + channels  
(Option a)

Basically we believe, that FCR is our fastest and therefore most important reserve, which must be always available especially under island conditions. Additionally we are sure, that the cost for a local measurement are neglectable.

### ELIA

Carton Filip [Filip.Carton@elia.be](mailto:Filip.Carton@elia.be) / 24.07.2018 18:19

Regarding the specific question on decentralized frequency measurement and redundancy of communications:

- we support the position presented by RTE in the attached slide set.
- moreover, we would like to encourage the SAFA drafting team to write a text on this matter that leaves to BSP the choice between:
  - o a local frequency measurement and ability to manage locally the expected (P,F) behaviour for each decentralized FCR providing unit / group, without redundancy of the communication channel between the SCADA of the BSP and each decentralized unit / group.
  - o A centrally controlled pool of decentralized FCR providing units / groups, with the rules proposed by RTE. In particular, these rules do not force BSPs to implement full redundancy of the communication channel, but instead they limit the impact of a common mode incident (= failure of a telecom provider) to the maximum amount of FCR that SO GL allows to lose (150 MW), by setting a limit to the amount of centrally controlled decentralized FCR in each LFC Block to 150 MW.

## RTE

ARRIVE Olivier [olivier.arrive@rte-france.com](mailto:olivier.arrive@rte-france.com) / 12.07.2018 14:37



RTE\_feedbacks on  
frequency measurem

## TTG

Grüneberg, Axel [Axel.Grueneberg@tennet.eu](mailto:Axel.Grueneberg@tennet.eu) / Mo 23.07.2018 09:28

on behalf of and in coordination with Peter Hoffmann, I would like to propose the following for centralized frequency measurement:

We are in favor of the proposed option "minimum number of frequency measurements per TSO".  
But with the additional requirements of:

- maximum 150 MW of FCR per frequency measurement and
- In case a FCR provider has more than 150 MW of prequalified FCR, the additional frequency measurement point will be defined by the connecting TSO, taking into account localization of current measurement and geographical distribution.

To ensure a FCR provision by a centralized frequency measurement, the complete communication infrastructure needs to be redundant. If a BSP has an appropriate alternative solution to ensure FCR delivery at any time, the TSO can decide to deviate from the communication requirement based on the proposed safeguarding concept of the BSP. The adherence of this concept needs to be monitored by the TSO.

## Energinet

Erik Ørum [EOR@energinet.dk](mailto:EOR@energinet.dk) Do 19.07.2018 13:18

The first part of the proposed solution in "20180706 SAFA\_Policy on LFCR\_Article A-2\_centralized f-measurement alternatives\_vFinal" will be: b)

The geographical size should be limited by requirering.

Amendment proposal:

*"Numbers of areas per TSO area has to be more than maximum possible FCR per TSO based on the requirements in SO GL divided by 150 MW".*

The second part of the proposed solution in "20180706 SAFA\_Policy on LFCR\_Article A-2\_centralized f-measurement alternatives\_vFinal" will be: b)

"Full redundancy of BSP communication component".

The used wording "BSP components" or "BSP communication components" have to be clear.

Redundancy of communication to TEs is out of proportion, redundancy of frequency measurements and where these measurement are located together with a redundant IT-solution at the aggregator could be a realistic solution.

The risk for controllability in case of a split is very limited. In the 2006 split, it could have been a difference of 300 MW shed load more than the 11000 MW, there was shed at that event.

Communication error between BSP and TE will be limited to parts of a telecommunication area, so it is not needed to have full redundancy to each TE.

Amendment proposal:

*"Each FCR proving Group utilizing central frequency measurement must use redundant frequency measurement and a redundant IT-system containing the activation algorithm."*

## Swissgrid

Yuen Yee Shan Cherry [Cherry.Yuen@swissgrid.ch](mailto:Cherry.Yuen@swissgrid.ch) / Mo 23.07.2018 10:22

### 1) Guidance for Centralised Measurements (FCR additional properties):

Geographical limits:

Option b). Rationale: with the highly meshed distribution networks within Switzerland option a) would oblige measurements at most distribution network points, which is impractical and unnecessary.

Redundancy:

Option b) (no redundancy on communication channels required), because we don't agree that the redundancy of the communication channels to each household is comparable to the outage risk of the conventional power plants. We believe that the option a) of redundant communication channels is not only unnecessary but would also hinder the development and evolution of demand side response (at households level) and aggregator concepts, and would be against the general European trend. Besides, the redundant communication channels requirement was added AFTER public consultation and was NOT requested from stakeholders.

## TERNA

Coluzzi Claudio (Terna) [claudio.coluzzi@terna.it](mailto:claudio.coluzzi@terna.it) / Mo 23.07.2018 13:51

With regard and concerning the solution proposed by the drafting team for the centralized frequency measurement, Terna expresses the following preferences:

I. Geographical distribution: At least 1 measurement

a) per connection point and galvanically separated grid area; AND max. 150 MW

II. Redundancy of communication: Full Redundancy of

a. BSP components + channels OR

PSE

Kornicki Marek [marek.kornicki@pse.pl](mailto:marek.kornicki@pse.pl) / Mo 23.07.2018 11:16

On behalf of Robert Trebski, attached we send our comments on the methodology of parts A and B using the provided template.

In addition, as requested, we send feedback on frequency measurements for FCR:

- **I. Geographical distribution:**

Due to the fact that one of the basic tools ensuring operational safety as intended, two frequency measurement methods (a) and b) adopted in the A-2 methodology can not be fully accepted due to potential danger and ambiguity in the interpretation of the options described (eg a literally reference to at least one 150 MW frequency measurement on the TSO scale can lead to only one frequency measurement at LFC Control Block level of size 150 MW) The superior rule should be based on local frequency measurement. This is technically justified for all types of PGM, in particular based on power electronics, which have such possibilities in a natural way. In conclusion, we suggest to refer to local frequency measurement with refinement of individual types of FCR delivering a unit or group: in the case of FCR providing a synchronous PGM unit, the measurement should be based on turbine revolutions, in the case of FCR providing the unit being PPM, if FCR is implemented at the level the main control system (DCS), the measurement should be made at the connection point / points even below 110 kV. In the case of the FCR providing group, the frequency measurement should meet the requirements specified for each type of PGM, which should have the ability to FSM and provide FCR.

- **II. Redundancy of communication:**

Due to the overriding objective of ensuring adequate quality of FCR provision, even in the case of a large-scale telecommunication failure, full redundancy in BSP communication components and fully redundant communication channels should be ensured in case of centralized frequency measurement. Therefore, the option a) is more appropriate.

MAVIR

Tihanyi Zoltán <[tihanyi@mavir.hu](mailto:tihanyi@mavir.hu)> / 20 July 2018 11:23

Regarding the central frequency measurement and redundancy we prefer the following options:

- I.b (should be defined the required number of measurements by each TSO)
- II.a (full redundant connection)

## ESO

Ivan Kezhov [IKezhov@ndc.bg](mailto:IKezhov@ndc.bg) / Mo 23.07.2018 19:07

- about the document 20180706 SAFA\_Policy on LFCR Article A-2 centralized f-measurement alternatives\_vFinal our opinion is following: we think the proposed centralized frequency measurement has two shortcomings:
  - it increases the costs - especially for communication
  - it creates additional problems about the implementation - a reduction of reliability, a necessity of specific back-up processes to solve the cases with system splitting and others

By this reason we think the current frequency measurement should not be changed.