Response ID ANON-Z9D4-4X7K-S

Submitted to **ENTSO-E Connection Codes Implementation Guidance Documents_Frequency Stability Parameters**
Submitted on **2017-12-20 17:19:19**

Introduction

1 What is your name?

Name:
Gaëtan Claeys

2 What is your email address?

Email:
gaetan.claeys@eugine.eu

3 What is your organisation?

Organisation:
EUGINE - European Engine Power Plants Association

Frequency Sensitive Mode

1 Do you consider this IGD helpful to reasonably support the national implementation process? (Please select only one item)

yes

2 Does the content of the IGD cover the technical issues of this topic appropriately? (Please select only one item)

yes

3 Comments on the technical information within this IGD

Technical Comments:
1.- The droop definition found in page 5 implies it is calculated based on active power range and the defined frequency deviation. This does not align with the standard droop definition equation, and impedes the setting of a droop value according to table shown just above in the text. It should be aligned with the one found in LFSM IGD.

2.- The initial delay (t1) should be for the whole plant and not per individual units (should be clearly stated to avoid confusions).

3.- Based on the "general comment", the recommendation on page 10 of an insensitivity of less or equal to 10 mHz should be increased to less or equal to 30 mHz. Additionally frequency measurement specification (measurement point, accuracy, device etc.) to be clarified.

4 General (other) comments

other comments:
1.- It is clearly stated that insensitivity helps the controller to avoid reaction to small frequency variations by filtering them, while still following the trend of the variations. They show this has negligible impact on the frequency distribution. The proposal is to stress the necessity of filtering and perhaps proposing a methodology to avoid constant changes in the units output when connected to the grid and responding to quick (and constant) frequency deviations.

Limited Frequency Sensitive Mode

1 Do you consider this IGD helpful to reasonably support the national implementation process? (Please select only one item)

yes

2 Does the content of the IGD cover the technical issues of this topic appropriately? (Please select only one item)

yes

3 Comments on the technical information within this IGD

Technical Comments:
1. On page 6 table 1 shows the activation thresholds. They are not all aligned with FSM (which is +- 200 mHz). A clarification comment is needed to the reaction of the unit in the frequency space between FSM and LFSM.

2. Droop equation found in page 7 could cause confusion. An initial statement that it is valid for delta f values equal or above delta f1 would be recommended.

Additionally, a better definition of delta f1 would be recommended (we understand this as the threshold value mentioned before). Droop definition, and mathematical equation to be clearly specified.

3. Regarding the response time: this document defines the dead time, step response time and settling times in Figure 1, but later only refers to the values given as “response time”. The document should clearly specicy that unless specified separately response time should be meant as Step response time.

4. In page 9 this document recommends a response time for active power decrease in case of increasing frequency of less or equal to 8 seconds for an active power change of 45%. This implies a decrease ramp rate of 5.625 %Pn/s which is extremely high. This is a requirement which cannot be fulfilled by an internal combustion gas engine. In the draft of the German guideline AR-N-4110 you can also find the response time of 8s, but this response time is connected to the maximum possible power ramp of an internal combustion engine. As a consequence, according to the AR-N 4110 internal combustion gas engines only have to reduce 8.88% power within 8s. Page 10 in the second paragraph, technical constraints related to the internal combustion Engine technology to be considered.

5. The maximum power which is mentioned needs to be defined clearly , for example, maximum registered capacity vs. available capacity and Unit vs. Plant.

6.IGD does not define the “tolerance ranges” .

4 General (other) comments

other comments:
No comment

Demand Response – System Frequency Control

1 Do you consider this IGD helpful to reasonably support the national implementation process? (Please select only one item)

2 Does the content of the IGD cover the technical issues of this topic appropriately? (Please select only one item)

3 Comments on the technical information within this IGD

Technical Comments:
N/A

4 General (other) comments

other comments:
N/A

Frequency Ranges

1 Do you consider this IGD helpful to reasonably support the national implementation process? (Please select only one item)

yes

2 Does the content of the IGD cover the technical issues of this topic appropriately? (Please select only one item)

yes

3 Comments on the technical information within this IGD

Technical Comments:
No comment

4 General (other) comments

other comments:
No comment

Maximum Admissible active power reduction at low frequencies

1 Do you consider this IGD helpful to reasonably support the national implementation process? (Please select only one item)

yes

2 Does the content of the IGD cover the technical issues of this topic appropriately? (Please select only one item)

yes

3 Comments on the technical information within this IGD

Technical Comments:
1. The proposal of having a “transient” and “steady state” can be helpful, but forces units to reduce very little during the first 30 seconds of the frequency variation. The different manufacturers need to give a statement on whether or not they can withstand such operating conditions when the frequency (unit speed) is reduced.

2. Page 10 gives no mention of the issues that internal combustion gas engines face when operating at lower frequencies (keeping the same power output results in increase of the medium effective pressure in the cylinders and also reduced mass flow in turbo chargers).

EUGINE therefore kindly requests that the following text is added on page 10: "Keeping a constant power output at lower frequencies results in an increase of the medium effective pressure in the cylinders, causing an overload operation that can have an effect on the lifetime and maintenance intervals of the units. The reduction in mass flow of the turbo chargers can reduce the boost pressure causing power reduction. Additionally, there is a compressor surge risk associated with this operation condition. Like all dynamic behavior of IEC (internal combustion engine) the possibility of constant power output at lower frequencies is based on the methane number as well. In general, a lower methane number means lower capability to maintain constant power output at lower frequencies."

4 General (other) comments

other comments:
1. On page 6, the last paragraph mentions “… significant amount of SPGM is linked to the maximum expected RoCoF for the normative incident in case of significant penetration of SPGM within the synchronous area.”, did you mean PPM instead of SPGM.

2. The following statement in page 9 is not clear: “This net additional active power output should be demonstrated at the connection point and therefore it is expected that the control system acting on the power of the primary energy source should, in addition to the increase of this power compared to the 50Hz value, further increase this power to compensate for any active power reduction at low frequencies discussed within this IGD.”

Automatic connection/reconnection and admissible rate of change of active power

1 Do you consider this IGD helpful to reasonably support the national implementation process? (Please select only one item)

yes

2 Does the content of the IGD cover the technical issues of this topic appropriately? (Please select only one item)

yes

3 Comments on the technical information within this IGD

Technical Comments:
This IGD does address relay protecton clearance, but the explanation is not adequate.The readiness of the plant of the disconnected components needs to be considered for reconnection before accounting the observation (Tobs)

4 General (other) comments

other comments:
No comment

Rate-of-change-of-frequency withstand capability (RoCoF)

1 Do you consider this IGD helpful to reasonably support the national implementation process? (Please select only one item)

yes

2 Does the content of the IGD cover the technical issues of this topic appropriately? (Please select only one item)

yes

3 Comments on the technical information within this IGD

Technical Comments:
1. We agree with te proposal of defining te conditions under which the RoCoF will be analysed, along with giving frequency time profiles to study the effect on the units. Methology need to be defined how to validate RoCoF capability.

4 General (other) comments

other comments:
1. On page 6 this document states that synchronous power generating modules can at least withstand 2.5 Hz/s with 100 ms time window. It needs to make a reference of where this was studied or presented, and clearly define to which technologies it applies.

2. Add “figure 3” from the following document on page 6 when the importance of time window size is mentioned:

http://www.soni.ltd.uk/media/documents/Archive/RoCoF%20Modification%20Proposal%20TSOs%20Opinion.pdf

Need for synthetic inertia for frequency regulation

1 Do you consider this IGD helpful to reasonably support the national implementation process? (Please select only one item)

2 Does the content of the IGD cover the technical issues of this topic appropriately? (Please select only one item)

3 Comments on the technical information within this IGD

Technical Comments:
N/A

4 General (other) comments

other comments:
N/A