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Open consultation of proposition for new technical requirements for FCR

Vattenfall welcomes the opportunity to comment on the draft for new technical requirements for the provision of FCR reserves for the Nordic area Vattenfall AB represent several potential sources that may provide this services. This response is our consolidated input.

A positive development is noted and welcomed

From an overall perspective, the TSOs have managed very well in taking stakeholder opinions from the pilot phase into account. Furthermore, the restructuring of the document makes it much more readable and easy to use. The relaxations of criteria, as well as reduction of criteria complexity and simplifications in testing procedures are also very welcome. Defining capacities in terms of theoretically computed and validated step responses is a good solution.

Make room for potential adjustments during the implementation phase

However, we have at this stage not been able to determine consequences from all changes of the criteria and we can this not rule out the risk for surprises or new findings when the prequalification starts. With this observation in mind, we ask the Nordic TSOs to serve for the possibility of additional adjustments during the year-long implementation phase.

Vattenfall also appreciates that the Nordic TSO:s share the opinion that the flexibility of existing resources should be utilized when possible. It is our belief that this goal would benefit from an approach where essential grid parameters are ensured at levels that do not make the FCR criteria stricter than necessary. The key parameter now is the frequency load dependence, from here on denoted by K.

Relaxing the requirement for "K" will have a substantial impact on the potential supply from hydro power units.

The increase of K in the frequency domain stability criteria is well received. We have been able to evaluate its impact on five hydropower units (two Francis, three Kaplan), in total 18 cases with the following result:

	Francis cases	Kaplan cases
All tested	11	7
# passing for K = 0.5 %	4	2
# passing for K = 1 %	5	2
# passing for K = 1.5 %	9	4

Hence, the increase in K from 0.5 to 1 % saves only one case, and that is for a Francis. Increasing the dimensioning level to K = 1.5 % gives a more substantial outcome. We remind of the circumstance that at low flow situations in Sweden, there are mainly Kaplan units in operation.
Setting a higher value for K will also have other desirable consequences in that the possible future market for droop-based FFR will become more attractive. Furthermore, almost irrespectively of the chosen level of K in the FCR criteria, flexible converter-connected resources have the ability to perform much better than any reasonable FCR criterion. Therefore, they will most likely be utilized more effectively in delivering faster services such as droop-based FFR or synthetic inertia.

A related observation here is that the TSOs communicate the position that FCR-D is for nadir/zenith management mainly. From that point of view, it might be reasonable to consider FFR as a reasonable replacement for inertia and static FCR-D as equally useful as dynamic. However, units delivering dynamic FCR-D that activates immediately outside the normal band will suffer more, the more inertia is replaced by FFR. The possibility for FCR-N to contain the frequency within the normal band decreases in low inertia situations and FFR does not help at all in that respect.

The conclusion from the above reasoning is that Vattenfall would consider it very unfortunate if dimensioning grid parameters, in particular K but also inertia, were set to too low levels. For K, the suggestion is to require at least 1.5 %.

Clarify the definitions in Requirement 1 – different interpretations show significant differences in inpat on available volumes of FCR.

In section 3.1.1: It is not clear if $\Delta P_{ss,theoretical}$ is the same thing in Requirement 1 upwards as in Requirement 1 downwards. If they are not the same, it seems self-evident that the step changes to compute are the ones corresponding to $\Delta P_{ss,1}$ and $\Delta P_{ss,2}$ respectively. Then it is however not clear which $\Delta P_{ss,theoretical}$ to use in equation (3). If $\Delta P_{ss,theoretical}$ is one and the same in the two requirements (and in (3)), some additional definition is needed. The examples in Appendix 1 indicate what is intended, but they are only examples. If the answer is that $\Delta P_{ss,theoretical}$ is one and the same in the two requirements, this results in an additional

complication for units (most) that have a non-linear relation between guide vane opening and active power output. The most likely outcome is that the maximal FCR-N capacity for each such unit will be limited to a rather small value.

Other and detailed comments

The requirement document is now rather well structured and it is a good decision not to clutter it with too much non-necessary information. However, an additional document is asked for, one that contains the motivations and explanations behind the criteria.

The main requirements are clearly pointed out (cf. p. 6) but if there are also minor, but still binding requirements, a complete checklist would be appreciated.

In section 2.1 is a statement “The application should contain all information required by the TSO”. This is preferably adjusted to “relevant” or “reasonable” information.
In section 3, early: “the activation shall in steady state be proportional to…” is preferably changed to something involving “approximately”, as on other locations where the same intent is expressed.

Both expressions “mode shifting” and “parameter shifting” are used in the document. If they refer to exactly the same phenomenon, a single expression is preferred.

Topics related to consumer based FCR

We welcome that Svk have initiated an investigation on how to implement a dynamic quota based on the inertia and the risk for over frequency.

Section 3.4.2: It seems like the blue area is designed so that static resources are allowed to over active to a bigger extent than under activate. We propose that you can deviate likewise in both directions. This because it seems like the design of the requirement are done to reduce the risk of over frequency. Also, of course our proposal gives us the opportunity to provide cheaper FCR, since our resources are not activated quite as often with a “symmetrical” blue area.

Section 3.1.3: Mode shifting should also be available for static FCR. This gives us the opportunity to filter small, quick disturbances and provide a more stable product from a resource owners point of view.