

Oral Discussions on Session: “Island Systems and Interconnections” – Part II

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Abstract

This paper contains the second part of the transcribed oral discussions of Session “Island Systems and Interconnections” of the 2013 IREP Symposium-Bulk Power System Dynamics and Control Sunday, held on Sunday afternoon, August 25, 2013. Papers [1]-[3] were presented.

Discussion

Chair: So, are there questions? Comments?

Costas Vournas (NTUA): This is a question for Dr. Mansoldo, for the Irish system [2]. I was a bit surprised that you need to do some voltage stability studies. Do you have a history of voltage instability in the Irish system? This is one question, and just to end up my thought, the 25% of loading margin seems very much if it is real time, I mean if it is on a real system situation. Because when the load changes by 25% many more generators will be operating, so the system will be quite different. So, two questions. One is: do you have cases of voltage instability in Ireland? Question 2: why do you consider 25% is not sufficient margin?

Andrea Mansoldo (EirGrid): Well, the 25% margin was just from testing the model of the system. We didn't have anything yet about the margins to be taken into account when you plan in terms of voltage collapse. Actually the reason why we develop this methodology is just to understand if it is worth to introduce in the near future as transmission planning criterion a limit of this kind. As far as the voltage instability question, we, according to my 5-year experience, we didn't have voltage collapse problems but we have voltage issues in different areas especially in the South of the country, the South-east of the country, so we have to keep in operation generation in different areas permanently even at low load. So that could be a tool that will evaluate whether instead of a must-run generator it could be a synchronous

compensator to substitute this type of operation, or a different technology that might be cheaper.

Mikael Wämundson (Gothia Power): For Dr. Mansoldo [2]. Two questions, or maybe just one, if the answer is no to the first question. This program, do you start from zero reactive support in the network and then run it to find an optimum? If yes, if you do that, do you find that your implementation of reactive support, as it is implemented now, is it far from what is optimum from your program point of view?

A. Mansoldo: Thank you for the question, that's a good question. Actually we run from zero because we had forgotten (because in the DC load flow there is not any reactive power) we had forgotten to put what reactive support was existing. And actually the value that we obtained was of the same size as what we had already installed, which is in the presentation about 3200. That's why we were surprised to have 10 times more with the lower cost, which means that maybe the savings we managed in the losses with the voltage profile may help, or may justify more Vars than what is at the moment in the grid. And this is our direction of study in the future of this topic as well.

Ian Hiskens (University of Michigan): I have a question that relates to the studies of dynamics in this session and in the previous session. And that has to do with the modeling and simulation. So there are lots of changes happening in power systems that lead to stresses that maybe the numerical integration techniques are not actually capable of replicating. I know that in one of the earlier presentations PSS/E was used, and I am sure other techniques use similar numerical integration routines, but when we are dealing with very low inertia systems do these existing techniques actually truly replicate behavior? When we are dealing with very high penetration of renewable generation do existing techniques actually replicate behavior? There are a lot of decisions being made based on simulation and of course that's all that we can do, but are multiple industry utilities using multiple different techniques to get some kind of

sensitivity analysis of studying variation of parameters to gain some kind of sensitivity analysis. It's sort of a general question to those who are doing dynamic studies presented both in the earlier part of the session and this part of the session as well.

Emanuele Ciapessoni (RSE, Italy): Of course we had the same experience, because the dynamic simulation is a very complex topic especially when we have a lot of uncertainties in the power injections and we need to develop probably some probabilistic technique also for dynamic simulation. A lot of work has been done for probabilistic load flow or things like that, also in an analytical way to do the probabilistic load flow and we will have a paper on this in the next days, but I think in the future we will be able to analyze the system with the probabilistic dynamic simulation. And probably this is a good way. Currently we have more or less Monte Carlo techniques, but we need some analytical tool in order to consider the uncertainty and the sensitivity. Not only the uncertainty of the single injection and load but also the ramp, the time derivative uncertainty and things like that. I think this is a very important research topic for the future.

Chair: Nothing else? If not, before finishing I would like to address to the authors my appreciation for their contributions, to the presenters my apologies for being a little bit too strict, and to the audience my thanks for their presence and participation in the discussions, because the most important part is participation in the discussions. So now we can go and enjoy the welcome reception. Thank you.

References

- [1] E. Ciapessoni, D. Cirio, A. Gatti and A. Pitto, "Renewable power integration in Sicily: frequency stability issues and possible countermeasures," Bulk Power Systems Dynamics and Control – IX (IREP), August 25-30, 2013, Rethymnon, Crete, Greece.
- [2] A. Berizzi, C. Bovo, S. Cuni, R. Zuelli, A. Mansoldo and M. Norton, "Var Planning Assessment in a meshed AC/DC System: The future Irish Transmission System," Bulk Power Systems Dynamics and Control – IX (IREP), August 25-30, 2013, Rethymnon, Crete, Greece .
- [3] A. Grobovoy, V. Shipilov, A. Arestova, I. Yadykin, V. Afanasyev, A. Iskakov and D. Kataev, "Application of Gramians method for Smart Grid investigations on the example of the Russky Island Power Network," Bulk Power Systems Dynamics and Control – IX (IREP), August 25-30, 2013, Rethymnon, Crete, Greece.