

Submission received via email to the GPSRR@AEMO.com.au mailbox

This is an urgent submission on the Approach Paper for the 2023 GPSRR which should be published on the GPSRR website, together with AEMO's initial response ASAP

Recommendation 10 of the 2022 GPSRR states:

10. Manage risks associated with non-credible loss of future North Ballarat – Sydenham 500 kV lines: north of Ballarat, and a new 500 kV double circuit line from north of Ballarat to Sydenham⁵. The non-credible loss of the proposed 500 kV lines during periods when the new 500 kV lines flow exceeds the limits of the parallel 220 kV lines, could result in multiple line losses. AEMO (as Victorian transmission planner) will consider this risk in the planning process.

AEMO has not considered this risk in the planning of VNI West. In fact, the presence of VNI West has increased this risk very substantially to a completely unacceptable level for Victoria as demonstrated below.

In the AEMO VNI West PACR, it is claimed that VNI West will

- (a) host 1,580MW of additional renewables at Murray River REZ (V2)
- (b) Plus an additional 200MW of renewables at Western Victoria REZ
- (c) Plus enable an additional 1,600MW on VNI imports into Victoria
- (d) And by moving the VNI West/WRL connection point to Bulgana, WRL's hosting capacity has been increased 860MW (from 600MW to 1,460MW)

The above changes total 4,240 MW compared with the contributions to load WRL at the time of the 2022 GPSRR (and recommendation 10) was published.

Whilst there would be some diversity in the maximum power flows from each of the above additional contributions, it is indisputable that the a re-assessment of the power flow on the new double circuit line from Bulgana to Sydenham will result in much higher levels that frequently exceed the limits on the parallel 220 kV line(s) between Bulgana and Moorabool. There is only one 220kV line between Bulgana and Ballarat, which is certain to overload and trip instantaneously on overcurrent. There are only three 220 kV lines from Ballarat to Moorabool, one going the long way via Terang. The tripping of the Bulgana to Ballarat line would create a huge surge of power flow on the single 220 kV line from New Kerang – Bendigo – Ballarat, causing virtually instantaneous tripping of that line, unless the Ballarat to Moorabool lines have already tripped

Irrespective of the sequence of the cascading tripping of the 220kV lines north of Moorabool, the outcome will be the same – a complete separation between north-western Victoria and Southern Victoria. The rapidly cascading power system collapse following that with no doubt involve the tripping of both the existing VNI and Heyward interconnectors. This will happen so quickly that Basslink and Marinus will be useless due to the very slow response of hydro-electric power stations in Tasmania. Any coal fired stations remaining in the Latrobe Valley will probably be backed down to their minimum loads, incapable of responding in the few cycles this collapse and will probably trip due to voltage or frequency instability. In any case AEMO predicts they will all be closed by the mid 2030's. The under-frequency load shedding will not begin to operate until the Southern Victorian power system has separated from the NEM, by which time it will be too late, too slow to make any difference (just like the 2016 SA blackout)

The eventual outcome of the cascading collapse of the Southern Victorian power system will most likely be the total blackout of Greater Melbourne and the Portland smelter and the rest of Southern Victoria

AEMO theory of automated control or protection schemes to averting such an outcome is pure fantasy as no such technology exists to my knowledge and it would require GW's of batteries in Southern Victoria but they are unlikely to be activate in time.

Overall, it appears that AEMO has been reckless in ignoring recommendation 10 of the 2022 GPSRR in expediting VNI West.

Another point for AEMO to consider, is how it will manage single credible contingencies during outages of any of the eleven 500kV circuits between Bannaby and Sydenham. Assuming each circuit has an availability of 98% (after accounting for forced, maintenance and project outages plus non-credible contingencies due to high winds, severe lightning, bushfires, that would mean that for 22% of the year, the NSW-Victoria interconnection must be derated to the stability limit of the parallel 330/220 kV network. This is likely to be only some 500MW, similar to the existing VNI limit. So for a quarter of the year, the new NSW-Victoria interconnection will be virtually useless in terms of transmitting the 10GW+ of new generation at Snowy 2.0, Wagga-Wagga, SW NSW, Murray R, and Western Victoria REZ's

Plan B for Victoria combined with undergrounding using HVDC from Wagga Wagga to South Sydney provides a far more resilient transmission network for Victoria and Southern NSW, at much lower cost and at an much lower socio-environmental impact.

I would be pleased to discuss these points with AEMO in a transparent forum.

Yours sincerely

Simon Bartlett AM