

ESO response to Sygensys

The ESO welcomed Sygensys's support to FRCR 2024 recommendation and acknowledged all the constructive comments. The ESO and Sygensys had a follow-up meeting to clarify questions and concerns.

- Sygensys requested more transparent information sharing on OTF and “call for actions” in collaborating with industry. ESO OTF term confirmed a future plan to call individual units' names where the information can be found in public domain. We acknowledged the “call for actions” comment and will embed this into future OTF event brief and deep dive sessions to raise the awareness in the industry of the criticality of an event or/and an operational issue.
- We understand the concerns around cascading events. The ESO doesn't have an automatic process or detecting tool to sense potential cascade trips following an early sign from the system. Following a system event, we run investigations to understand the root cause and identify individual tripping mechanisms. Historical events do not provide us clear insights into the probability of coincident or cascading events, and it is difficult to model the correlation between a trip to the other. As we explained in FRCR 2024 report, based on operational experience, simultaneous events probability and volume assumptions in current model is adequate to reflect system risks. It is however in our plan to review the assumption of simultaneous events in FRCR 2025.
- Fault Ride Through (FRT) risk is not included in FRCR as it is a Grid Code compliance issue and is managed through GC155 discussion. We would need to consider the new risks into future FRCR when GC155 is concluded. However, we continue learning from recent system events by monitoring system and running investigations. Mitigation measures are introduced to remain system security.
- The ESO will review GC151 and GC105 reports to improve transparency. We are unable to directly share more data if that is provided by a 3rd party. Reviewing past events and their reports will further help modelling of simultaneous events which will be updated again in FRCR 2025.
- We also acknowledged Sygensys's comment regarding interaction between FRCR and system restoration. A paragraph is added into the final report. Additional risks introduced by connection of Distributed Generators (DGs) will be considered into future FRCR with a better frequency control model.

Information presented in this document summarises ESO's response to Sygensys's consultation reply and include discussions in the meeting with Sygensys.

No.	Question	Comments	ESO Response
1	Overall, do you agree that the FRCR 2024 represents appropriate	The GB system has an enviable record of reliability. The FRCR process contributes to that, however I have a concern that some	Thank you for your comment. As you rightly pointed out, we regularly review new risk and in FRCR 2024 we have list potential new scope for

	development in determining the way that the ESO will balance cost and risk in maintaining security of supply while operating the system?	threats to system security may be underestimated in FRCR 2024 and should be considered in future updates, as suggested in FRCR 2024 Section 8 “Future considerations”.	future FRCR in section 8. We will take your feedback into our next FRCR.
2	Do you agree that the FRCR 2024 has been prepared appropriately? Please elaborate.	I think that FRCR does not adequately address the risks associated with the probability and impact of coincident events leading to a cascade failure and further work will be required in future updates.	<p>Thank you for your comment. We don’t have an automatic process or detecting tool to sense potential cascade trips following an early sign from the system. Following a system event, we run investigations to understand the root cause and identify individual tripping mechanism. Following the event investigation, we would</p> <ul style="list-style-type: none"> • follow up individual unit through compliance route and restrict its output until it is fully compliant. • If the issue is identified to be more common presented by multiple units and not covered within existing code, ESO can initiate Grid Code Modification process and start engaging with the industry. ESO will introduce mitigation measures to remain system security. • ESO will initiate innovation research, develop new operational strategies, tools and processes if a new operational risk is observed. Research outcomes and operational changes will be factored into future FRCR. <p>It is difficult to model the co-relation between a trip to the other. Historical events does not provide us clear insights into the probability of co-incidents or cascading events. As we explained in FRCR 2024 report, based on operational experience, simultaneous events probability and volume assumptions in current model is adequate to reflect system risks.</p> <p>It is however in our plan to review the assumption of simultaneous events in FRCR 2025.</p>
3	Recommendation:	Agreed	Thanks for the feedback.

	Maintain minimum inertia requirement at 120 GVA.s		
4	Recommendation: Consider additional DC-Low requirement	Agree	Thanks for the feedback.
5	Do you agree ESO to propose lower minimum inertia requirement before FRCR 2025	Issues related to coincident (cascade) events should be addressed first.	Thank you for your feedback. As mentioned in question 2, we believe current simultaneous events probability and volume assumption in current FRCR model is adequate to reflect system risks. As a follow up action, we will review GC151 & GC105 reports to see any other information could have provided in the report and to improve overall transparency we used for simultaneous events analysis.
6	Do you have any other comments?	See following information. The supplementary comments are summarised as below: <ul style="list-style-type: none"> Requested more transparent information sharing on OTF and “call for actions” in collaborating with industry. Requested more events / incidents / near-miss reporting, share higher resolution data including DER data. Re FRCR, requested to consider new risk types, include SSO risks, review LFSM capacity, consider under delivery of responses, include system defence plan into future FRCR. Investigation of under-delivery of response and any risks arising 	<ul style="list-style-type: none"> ESO OTF team has a plan to not hide unit name in the future where the information can be found in public domain. We acknowledge the “call for actions” comment and will embed this into future OTF event brief and deep dive sessions. All system events are published in line with GC151 & GC105. We are unable to directly share more data if that is provided by a 3rd party. However we will review current published reports to see any other information could have provided to improve overall transparency. In the meeting with Sygensys, we explained we publish frequency data in ESO data portal, based on which ESO’s operational decision is made. External members can download the data for their own analysis purpose. We understand current simultaneous events probability and volume assumption in FRCR model is adequate to reflect system risks. Refer to our response in Q2, based on operational practice, any new risks identified will be considered into future FRCR.

		<ul style="list-style-type: none">• Requested to clarify FRT requirements in GC155.	<ul style="list-style-type: none">• Based on our current investigation outcome from SSO events, reduced national inertia does not cause or exacerbate the risk. Investigation into the root cause of SSO events is ongoing in the ESO and is managed by a different workstream. Mitigation measures are introduced and more findings will be shared with the industry when they are available.• LFSM review is planned in the future FRCR scope.• Under-delivery of response is regularly monitored by the ESO and mitigation actions have put in place to minimise operational risks. This is well managed via ESO operation process.• Meeting minutes re GC155 discussion has been updated on ESO website.• At the moment, our view is general FRT risk should not be included in FRCR as it is a Grid Code compliance issue and is managed in such way. Following conclusions of GC155, if this issue, or a portion of it, ceased to be a compliance issue (e.g. due to relaxing the current fault ride through requirements), we would need to consider it within the FRCR model. We note, however, that the costs associated with managing the risk of “compliant but unable to ride through generation” plus a fault on the BMU that would trigger such an overvoltage is likely to be too high to be secured.
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