

Paris Session 2022



C2 – Power system Operation and Control

PS2 - Question 2.9: What new or additional tools will power system operators need in order to be able to foresee, prepare and react to extreme operating conditions?

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Some New / Additional Proposals Tools to face extreme operating conditions

- **New tools to reduce the uncertainties related to RES generation forecasting.**
- Reliable forecast of extreme weather, wind in particular, as well as fires and lightning indicating possible risks conditions their severity degree, a few hours in advance and their associated consequences to the vital installations (transmission lines inter-regional interconnections , etc.). Thus, the power system can be move to a more secure region of operation A warning alert can be sent to maintenance team and other sectors, resulting in order to speed-up load restoration process, in case of disturbance.
- Reliable early warning system, keeping the operator aware of the operation conditions in adjacent or external interconnected systems
- New advanced resources controls in control rooms, through Artificial Intelligence (AI) techniques to improve operator's situational awareness, allowing them to take adequate operative measures.
- High performance to man-machine interface (MMI)
- Better TSO/DSO integration related to proceedings and data
- Effectively estimating of Available Transmission Capacity (ATC) under extreme operating conditions as well as to define how to operate the power system in case of a very important installation unavailability (power plants, substations or transmission trunks).
- New SIPS with faster response and more intelligence
- New Operator Training focused on further development of operators' knowledge, skills, and decision-making abilities.
- Full integration of planning operation and real time operation teams in order to avoid future bottlenecks in power system..

Considering that blackout severity is proportional to the duration of the loss of supply, it is key to work hard to reduce the average load restoration time. Some actions that can be taken are:

- Increase the number of power plants with black-start devices.
- Keep replacement spare components, especially in areas strategically distributed along the system.
- Implement house-load operation for thermal and nuclear power plants.
- Assign or build dedicated transmission lines to ensure power supply for thermal and nuclear power plants from some specific hydro plants.
- Prevention and restoration strategies may not be enough. Quick and consistent communication is emerging as crucial, and it is driven by what consumers and other external stakeholders need, not solely on what the utility thinks it is important.
- Customers have said they wanted more information on power outages, specially during storms.
- Reinforce all regarding restoration process after large disturbances. The creation of restoration support areas with electric spare, equipment, trunks, and maintenance specialists strategically located as already adopted by PJM in USA and CTEEP in Brazil are mandatory.