- Abstract, line 1: Does “in distribution applications” mean that the turbines are connected to the distribution grid, or that they are distributed around a wider area, i.e. are not part of a wind farm?
Thanks, this should have been “distributed applications”. Typo corrected. It means the latter.

- Abstract, line 12: A limitation to “easy to integrate with the existing controller” may be, that an existing commercial operational controller would be required to have a derate functionality and an input port for derating commands.
True. Updated to “most existing controllers, just requiring derate capability”. The updated controller in this study was in view, but I do think it’s better to focus on potential applications.

- Section 1, line 22: The term probably should be “shutdowns” instead of “shutdown”.
Agreed and corrected.

- Section 1.2, line 58: The “Pourmohammed” reference contains one surplus bracket.
Corrected

- Section 1.2, line 85: It could be specified that the stated goals are only two amongst many others (e.g. also alleviation of tower loads).
Good point; added this.

- Section 2, line 138: Maybe you can specify which “mechanical systems” are utilized in an open loop stop.
Updated the stop discussions with relevant details about systems used and ramp rates.

- Section 2.1, Derate warning mode: I understood that the unit “pu” in the power context is always with reference to rated power. If so, I am not sure about the fixed upper saturation limit of 31/32pu. Shouldn't the upper limit be dynamically set to one power step below the lowest power where a derate warning has been triggered since the last FIRC reset by the grid operator? Example: A derate warning is triggered at P_derate = 1pu, but is also present when P_derate =31/32pu. The FIRC steps down to P_derate = 0.5pu and the derate warning vanishes. Consequently, the FIRC would gradually step up until 31/32pu, where the derate warning is triggered again. Consequently, the procedure of stepping down and back up to 31/32pu would be repeated, right? Thus, wouldn’t P_derate periodically oscillate between 31/32pu and 30/32pu, and periodically activate the derate alarm? The above proposed dynamic rule would set an upper saturation of 30/32pu = 31/32pu (lowest power with derate warning) – 1/32pu (smallest step size), preventing this oscillation.
I’ve added a footnote discussing this. I’ve kept the logic as is, as it’s simple and maximizes potential power output. It’s mostly to demonstrate the concept, and would likely be refined using ML/AI to develop an advanced algorithm.

- Section 2.1, Stop warning mode: Could it be reasonable to also inform the grid operator about the expected normal/open-loop/emergency stop power trajectory? Depending on the ramp slope, the grid operator could select the best spinning reserve generator.
That would be helpful information. Added as an output.

- Section 2.1, lines 168 f.: The jump to Fig. 5 and 7 in the results section feels a bit distractive and does not seem to be necessary.

Thanks for the feedback. I've removed the references.

- Section 2.3, Table 2: Which acceleration quantity (location, direction) is represented by "x acceleration"?

Fore-aft. Added.

- Section 4.1, Fig. 5: Why does the actual power seem to have an always-positive steady-state offset to the commanded derate power? Consequently, also the power predictions would be misleading for the grid operator.

This is because of the specific warning in question: the warning is that the 1-s average power is too high, which could happen because of, for example, high turbulent winds causing the wind turbine to produce more power than expected. So, the derate keeps the wind turbine safe, but it still temporarily produces more power than expected.

- Section 4.1, Fig. 6: Why is the actual power negative at t=50s?

That's a model artifact, which I have filtered out.

- Section 4.1.3, line 274: Does "model controller instability" refer to instability of the FIRC or of the operational controller?

Clarified: "Instability of this model's operational controller".

- Section 4.2.2: I have the impression that the figure files (but not the captions) have been interchanged for Fig. 9 and Fig. 10.

Thank you, you are correct. Switched back to the right files.

- Section 4.2.2: In the scenario with FIRC, the turbine exactly faults at that moment when the diesel generator has completed its start-up. However, it would be fair to state that this fault event time represents a lucky optimal coincidence, and could have happened either during diesel start-up or hours after diesel start-up.

This is a good point. I've updated the diesel ramping to be more realistic. The diesel synchronizes for 30 seconds, then connects and ramps up. In the FIRC case, as it ramps up, the wind turbine ramps down. I also included the wind turbine ramp down that corresponds to a normal stop in the baseline case.

- Section 4.2.2.: Thinking further, in some scenarios of short time frames between warning and fault and with an expensive battery, it may be advisable to emergency-start the diesel after the FIRC stop warning, right?

That's right. There's a tradeoff between the potential of high battery power flow (reduces battery life) and the danger of crash-starting a cold diesel. I've chosen a more relaxed start in the FIRC case.

- Section 5: For me it would be interesting to extend the outlook by potential benefits of FIRC-equipped turbines in a wind farm control setting. For instance, the derate prediction also represents a prediction of changes in the wakes, which could be utilized to proactively optimize operation of the other turbines in the farm.

I like this idea. Added as future work.