

Dealing With Electric Grid Disruption

Post by “Julia” of May 11, 2024 at 5:27 AM

[Quote from Martin](#)

From my reading of the past, I got the impression that the North American power grid is more vulnerable than the European. California should have particular difficulties to restart when a long black-out happens.

I disagree. The US has many nuclear power plants, and overall is supplied mostly from large fossil fuel plants or large dams, like the Hoover dam. Each of those can black-start to begin with, and their giant synchronous generators aren't easily swayed by demand fluctuations, allowing them to act as inertia buffers to add section after section of the grid - remember that 60 Hz need to be kept at all times, with a very low margin of error. In France or Switzerland, the situation is similar. As far as I know, the Californian grid suffered shortages in total supply and things like that; that's different from black-start capability, however.

In Germany, what little nuclear power remained is practically dismantled, coal plants are scheduled to be dismantled soon. This leaves only gas turbines as a source of power with black-start capability. However, their supply pipelines need a grid to function properly (compressor stations, etc). Even if they had gas to run on, by comparison with coal or even nuclear, they don't have a gigantic flywheel to powerfully stabilize the grid frequency, and their individual power output is quite low. This would make black-starting the grid a painstaking effort, with very small sections added, slowly, one by one, because the other sources of power do not have black-start capability to begin with, for instance because they do not have inverter/rectifiers capable of stand-alone operation (cannot function independent of an external 50 Hz frequency source).

Don't confuse the horsepower or the mileage you can get out of an engine with your ability to start it 😊

But discussing grid architecture really wasn't what I was aiming at; my executive summary should remain: Anything can happen for any number of reasons, which is why we all prepare for all kinds of things all the time. It's why we have a piggy bank. It's why we bring our phone on a hike. It's why we have insurance. So there shouldn't be anything weird about preparing a bit to ensure what's most natural and necessary. I'd even go so far as to flip it: The odd and peculiar thing is that most people nowadays *aren't* preparing to ensure their food and shelter anymore.