COUNTERFLOW
BY STEVE HUNTOON

Clunkers Shoot Selves in Foot

By Steve Huntoon


Huntoon

The few supporters of the U.S. Department of Energy's proposal to FERC have promoted an insane rush to judgment in the absence of anything remotely resembling an emergency — or even a problem.[1]

In the reckless stampede imposed on the electric industry, these clunker owners have shot themselves in the foot. Twice.

First, they have largely accepted — and even refined — the provision of the DOE proposal that makes their nuclear units categorically ineligible for any subsidy.

Second, they have invoked the risk of electromagnetic pulses and geomagnetic disturbances as a basis for the DOE proposal when their coal and nuclear units are the most vulnerable to such risk.

Clunker Nuclear Units are Ineligible for Subsidies

The DOE proposal is amorphous on almost everything, but it is crystal clear that an eligible resource must be able to provide "ancillary reliability services," specifically including "frequency services."[2]

FirstEnergy suggested refining "frequency services" to "frequency response services" in order to "reflect terminology typically used by RTOs/ISOs." [3]

Thank you, FirstEnergy, for straightening the deck chairs on the Titanic.

Because here's the thing: Nuclear units can't and don't provide frequency response. The Nuclear Energy Institute, on behalf of its members like FirstEnergy, Exelon and Public Service Enterprise Group, was vehement in comments to FERC last year that nuclear units had no or limited frequency response capability, and for those few nuclear units that might be able to provide limited frequency response, the Nuclear Regulatory Commission doesn't allow it.[4]

In reliance on those nuclear industry representations, FERC proposed to exempt all nuclear power plants from providing frequency response.[5] You can't eat your cake and have it too.

By the way, in the significant frequency event in the Eastern Interconnection studied by NERC, nuclear units actually provided a *negative* response of 12 MW.[6] In other words, they made the reliability problem worse. No participation trophy for them.

Another required service is "operating reserves." This means a generating unit must change output on command to help cover the loss of another generator on the system. Nuclear units don't provide this service because they operate at 100% capacity (so no "headroom"), and because changes in output present unique safety problems, as described to FERC at a technical conference in 2010 by Jack Grobe, then deputy director of NRC's Office of Nuclear Reactor Regulation, now executive director at Exelon Nuclear (emphasis added):[7]

> "Power is not infrequently adjusted a few megawatts to deal with equipment issues. For example testing of valves, changing of rod patterns in the core, but those are just a few megawatts. More significant power changes introduce things like what Bruce [Mallett, NRC deputy executive director for reactor and preparedness programs,] was saying; those require a lot of equipment manipulations and it introduces the potential for human factors concerns. *Human errors, things of that nature.*
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> *"From a safety perspective*, it also introduces changes in the dynamics of the core, because the neutrons that create fission also burn or destroy *poisons* in the core and the fission of the uranium nucleus creates poisons. There is a unique balance that goes back and forth when you make power changes to building in of *poisons* and burning out of *poisons* and different things of that nature. So, it changes the dynamics on how the fuel burns and this affects the efficiency in the fuel economy for the operator. Not a concern of ours, but it creates instabilities in the way, not unsafe instabilities, but just changes in the way the core behaves. *So, all of those things introduce the opportunity for perturbations to the safety of the core from the standpoint of the way the operators have to respond."*

Translation: Any nuclear unit that would vary output to provide operating reserves is taking a walk on the wild side. Ain't gonna happen.

Bottom line: DOE specified two "ancillary reliability services" that an eligible resource must provide, and nuclear units can't and won't provide them.

Coal, Nuclear Most Vulnerable to EMP/GMD

Exelon invokes EMP/GMD risk in support of the DOE proposal.[8]

Here's the thing: DOE's own Oak Ridge National Laboratory identified coal and nuclear units as the most vulnerable to EMP risk.[9] Coal and nuclear cooling tower motors have a particular vulnerability. And nuclear units have additional vulnerability due to "the extremely complex reactor control circuitry in control rooms."

So if EMP/GMD risk is important, that favors maximizing natural gas and renewable resources and minimizing coal and nuclear units. It's the diametric opposite of subsidizing uneconomic, unreliable coal and nuclear clunkers.

Isn't it Ironic?

In their reckless haste, the clunker owners overlooked the fact that their own nuclear units aren't eligible and that the EMP/GMD risk they invoked is greatest for their own coal and nuclear units.

Isn't it ironic, don't you think?

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[1] My last column showed that the chance of a winter generation deficiency in PJM is much less than one in 5,000, and were that to occur, the chance of the deficiency being due to a fuel supply emergency is remote. And if these two remote circumstances were to coincide, PJM would still have reliability tools to avoid customer impact. There is no beef.

[2] Proposed 18 C.F.R. §35.28(g)(10)(i): "An eligible grid reliability and resiliency resource is any resource that: …(B) Is able to provide essential energy and ancillary reliability services, including but not limited to voltage support, frequency services, operating reserves, and reactive power;"

[3] https://elibrary-backup.ferc.gov/idmws/common/opennat.asp?fileID=14720893 (page 40).

[4] https://elibrary-backup.ferc.gov/idmws/common/opennat.asp?fileID=14213680. "… nuclear generating units have no or limited response to interconnection frequency changes." (page 3). "In summary, even if a nuclear unit does have the capability to provide a limited response (typically a maximum of 1% reactor thermal power) to a significant frequency deviation; the NRC licensed operators are not authorized to operate the unit above the maximum power level as specified in the NRC issued Operating License and they are required to take immediate actions to restore reactor power to less than 100.0% Reactor Thermal Power in the event of any transient." (page 4).

[5] https://elibrary-backup.ferc.gov/idmws/common/opennat.asp?fileID=14401057 (para. 51).

[6] http://www.nerc.com/docs/pc/FRI_Report_10-30-12_Master_w-appendices.pdf (page 96).

[7] https://elibrary-backup.ferc.gov/idmws/common/opennat.asp?fileID=12357307 (pages 43-44).

[8] https://elibrary-backup.ferc.gov/idmws/common/opennat.asp?fileID=14722658 (page 2).

[9] http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA237104 (pages 20-22).