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It’s not “What If…”

Rick Knea Manager Business Development

Adtran/Oscilloquartz

What if…the power grid lost GPS:

PNT
cyberthreats

0-5 Minutes

No visible impact, Systems keep running using internal clocks

5 Minutes to 30 Minutes (PMU Impacts)

Time errors grow from microseconds to milliseconds
Phase angle errors start appearing
Total Vector error may exceed IEEE C37.118 thresholds

30 Minutes to 2 hours

Power oscillation dampening degrades
Protection systems begin to get unreliable
Fault detection can misinterpret events

2 -12 Hours

Time-stamp mismatches occur
Frequency and phase mismatch grow
Automatic protection could trigger cascading outages

12-24 Hours

-Without backup timing, parts of the grid **could** separate into islands
-Experience voltage collapse
-Trigger rolling blackouts

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Why it doesn’t instantly fail

Most critical infrastructure has holdover timing

- -Atomic Clocks
- -Rubidium oscillators in existing clocks
- -Redundant timing sources (PTP, eLoran, LEO Satellites)

The **REAL DANGER**

- **-Cascading failures**
- -The grid doesn’t fail because GPS disappears, it fails because
  - -Measurements become inconsistent
  - -Protection systems make bad decision
  - -Those decisions trigger chain reactions

DOE/PNNL warns that extended GPS loss increases recovery time and miscoordination risk even if power stays on

Resilient & Asssured Stability

OSA 3200 SP

-Low cost optically pumped cesium

-Long holdover, affordable price

OSA 5405-S

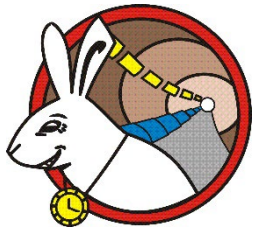
-Low Earth Orbit (LEO) Capable

-Secure, encrypted, 1000x stronger

White Rabbit PTP Protocol

-In a PTP backup configuration

-Pico-second accuracy



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Thank You

THIS IS NOT THE END…..ITS JUST THE BEGINNING!

Rick Knea Manager Business Development

Rick.knea@adtran.com 503-858-7340

Oscilloquartz.com