



NERC Lessons Learned

Kevin Hatch, Sr. Manager Dispatch

System Operations Subcommittee

April 26, 2024

- Protective Relay Solid-State Output Contact Voltage Leakage

- An entity experienced unnecessary breaker failure initiation signals due to solid-state output contact voltage leaks which can operate downstream devices with optically coupled isolator (OCI) inputs or air gap inputs. A traditional corrective action was used that is now considered a less than optimal work-around by the vendor.

The entity created an internal alert to install 47 K Ω pull-down resistors on the solid-state outputs to prevent the leakage voltage from rising above the OCI BFI inputs. When possible, the entity sets the de-bounce delays of inputs for critical circuits to 2 ms or more.

Solid-state outputs can leak voltage, potentially causing issues with protective equipment. To address this issue, appropriately sized (much smaller impedance) pull-down resistors can be placed in-parallel with solid state outputs across the OCI or air gap input.

- <https://www.nerc.com/pa/rrm/ea/Pages/Lessons-Learned.aspx>

Presenter:
Kevin Hatch,
Kevin.Hatch@pjm.com



Member Hotline

(610) 666 – 8980

(866) 400 – 8980

custsvc@pjm.com

**PROTECT THE
POWER GRID
THINK BEFORE
YOU CLICK!**



Be alert to
malicious
phishing emails.

Report suspicious email activity to PJM.
(610) 666-2244 / it_ops_ctr_shift@pjm.com

