



Transient Over-voltages (TrOV) with Inverter Based Generation

ITWG Discussion

April 24, 2019

Summary of 8/29 EPRI Presentation on IEEE C62.92.6-2017

Supplemental Ground Sources - Provides no benefit for reducing overvoltages during ground faults unless the island is dominated by line-to-line load

Drawbacks of Supplemental Ground Sources

1. Desensitize utility ground fault detection
2. Subject to overload due to system imbalance
3. Maintain energization of opened phases

Hawaii Approach

- Discussions with HECO engineers verified their use of self certification to ensure that the inverters meet their transient overvoltage requirements. It was recommended reaching out to Andy Hoke at NREL who initially helped them.
- Inverter manufacturers are required to pass the transient test that was jointly developed by NREL and HECO prior to interconnection.

NREL / Hawaii Article Summary

April 2018 article written by NREL / Hawaii that included the following :

“The team found that all four products responded quickly to transient over-voltages by cutting their output, demonstrating that, when smart inverters are installed, voltage spikes pose less of a problem than originally feared. This work gave the utility the [technical information](#) needed to lift restrictions on Oahu's distribution lines and provide customers with guidance for installing and configuring their choice of the NREL-vetted smart inverters, or performing similar tests to self-certify other inverter models—at least until the test is incorporated into national standards. ”

The entire article is at <https://www.nrel.gov/news/features/2018/nrel-and-hawaiian-electric-navigate-uncharted-waters-of-energy-transformation-part-1.html>

Industry Technical Documentation Questioning the use of Grounding Banks

The following are some of the major publications that question the current use of grounding banks:

- IEEE Guide for Application of Neutral Grounding in Electrical Utility Systems - C62.92.6-2017
- NREL Inverter Ground Fault Over-Voltage Testing – 2015
- IEEE – Impact of IEEE 1547 Standard on Smart Inverters (B.1.3.2) – May 2018

Recommendation

- Follow HECO self certification process for future installations (use their list)
- Create Utility sub group to create a list of their concerns regarding the TrOV documentation provided.