

# EPIC 3.15: Proactive Wires Down Mitigation

## Rapid Earth Fault Current Limiter

*Franz Stadtmueller*

*Senior Advising Electrical Engineer*

*Pacific Gas & Electric Co – Applied Technology Services*





# REFCL Introduction

- When a ground fault occurs, such as a powerline breaking and hitting the ground, it can create a spark, potentially starting a fire
- **Rapid Earth Fault Current Limiter (REFCL) technology is an extension of resonant grounding at a distribution substation to neutralize ground fault current and prevent a spark**
- REFCL has been successfully deployed in Australia to reduce risk of fire from ground faults, but their substation designs are different from PG&E's
- One type of REFCL is known as Ground Fault Neutralizer (GFN)
- REFCL could be applied to approx. 80% of PG&E HFTD distribution circuit miles (3-wire circuits)

# Australian Ignition Testing

Normal Ground Fault



With REFCL Technology



90% Reduction in ignition probability with REFCL limiting current below 0.5 Amps

## Swedish Neutral Ground Fault Neutralizer





# PG&E Demonstration

- GFN equipment was installed at a PG&E distribution substation in Napa Valley
- Demonstration and Testing planned in 2022



# Questions

