EPIC 2.34 Predictive Risk Identification with Radio Frequency (RF) Sensors

9/29/2020

Agenda

- **Executive Summary**
  - Issue Addressed and Project Objectives
  - Key Findings and Conclusions
  - Comparison of Technologies

Issues Addressed and Project Objectives

Issues Project Sought to Address

- ***Predictive Maintenance*** – Just-in-time maintenance through incipient fault monitoring has the potential to lower operational costs and reduce risks.
  - Work can be performed at lower cost through routine maintenance than emergency operations.
  - Asset failures and faults result in wear and tear on the grid, may cause collateral damage to nearby infrastructure..
  - Asset health conditions are dynamic and can change quickly for aging infrastructure under environmental extremes.
- ***Risk Reduction*** – Equipment failures and faults pose a safety risk for employees, the public and the environment.
  - Risks are heightened in high fire threat districts and due to climate change.
  - Continuous asset health monitoring through sensor technologies enables real-time tracking, trending and prioritization of developing risks on the grid.

Project Objectives

- Evaluate the performance of RF monitoring technology for partial discharge monitoring in distribution grid asset monitoring. IND-T's Early Fault Detection (EFD) technology was demonstrated.
- Compare and contrast the performance of RF sensors against Distribution Fault Anticipation (DFA) technology.
- Determine market readiness for solutions in a real grid environment
- Identify gaps for full-scale deployment and make recommendations on path to production.

Key Findings and Conclusions

Key Findings

IND-T Early Fault Detection (EFD)

- RF network monitoring technology has demonstrated unique benefits in the detection and location of partial discharge, to within +/-25ft accuracy, that cannot be detected with other technologies.
- Sensors enabled PG&E to detect, locate and field verify asset risks including conductor damage, broken strands, vegetative encroachment, transformer discharge, and arcing at a loose conductor clamp.
- Can be leveraged to detect asset hazards that can develop into wildfire ignition risks and perform corrective maintenance before the hazards materialize.

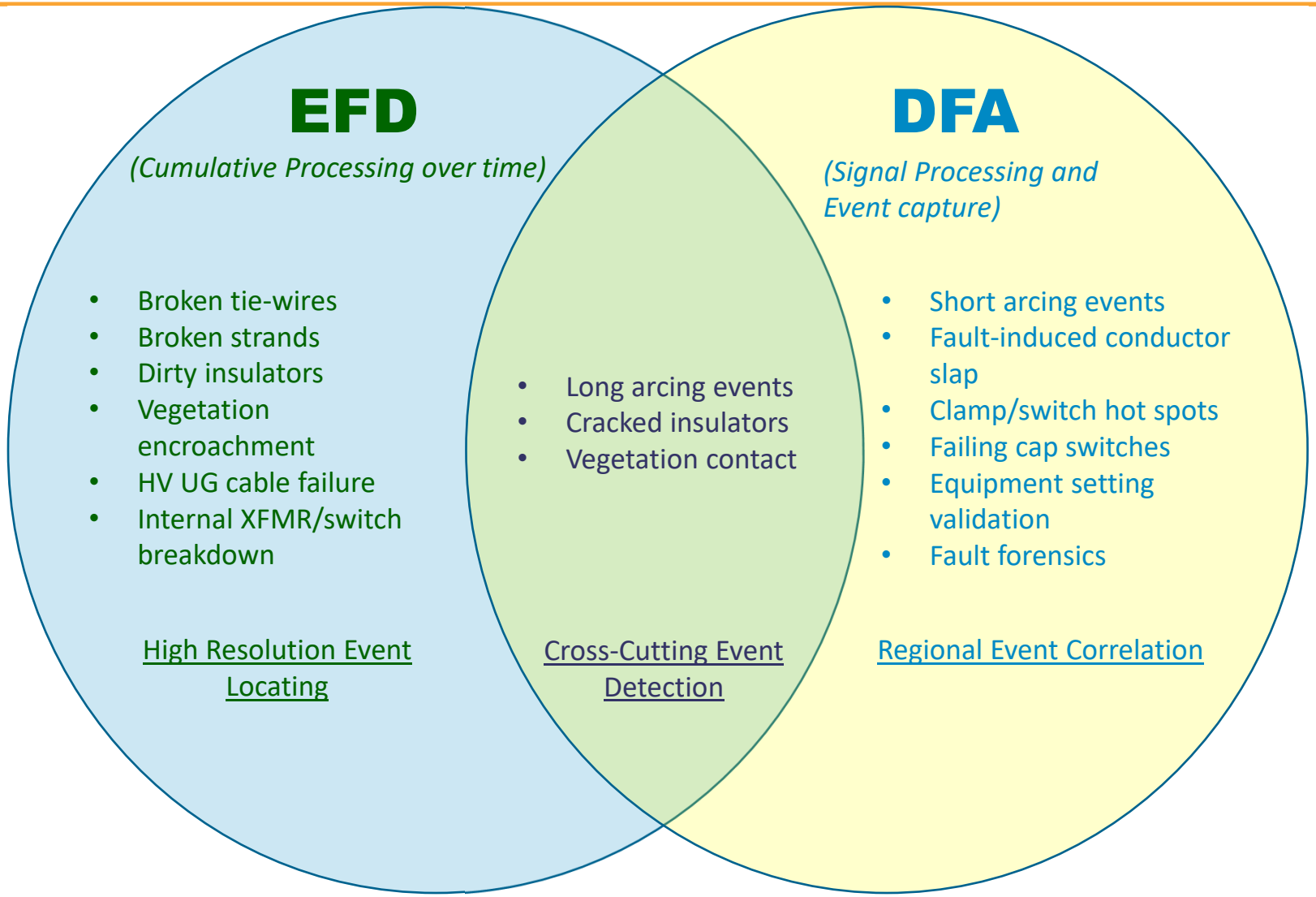
Texas A&M Distribution Fault Anticipation (DFA)

- Low cost, advanced waveform analysis technology that excels at identification and classification of events
- Provides higher resolution data that is currently available from PG&E's monitoring systems
- The only sensor technology that can identify low energy shunt arcing events.
- Needs supplemental data to be able to locate asset risks.

Conclusions

- PG&E has concluded that both technologies are effective and complementary to each other for monitoring grid asset conditions.
- The next generation of EFD technology should be evaluated.
- A Data Integration and Analytics platform and/or DMS are needed to apply these solutions at scale.

Comparison of Technologies



Types of events detected are driven largely by cumulative detection (employed by RF Sensors) vs. continuous monitoring of waveforms and signal processing to detect single/infrequent period event (employed by DFA)

Thank you