Resilient Alaskan Distribution system
Improvements using Automation, Network analysis, Control, and Energy storage (RADIANCE)

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Design of Networked Microgrids – Zonal Approach

Tightly-coupled Microgrids
[as the case of City of Cordova, Cordova Electric Coop]

- Data and energy/storage resource exchange between components of two or more closely located microgrids (within few miles)
- Connected physically using local tie-switch or transfer switches, that operators/automated algorithm can close or open to increase overall resilience

Loosely-coupled Microgrids
[geographically dispersed Alaskan villages]

- Data communication-based coordination
- Zero (minimal) physical power exchange over Medium Voltage network. Thus, microgrids be physically very far from each other (100x miles)
- Resilience Metrics shared between each individual microgrid such that overall distribution network resilience can be improved

Zonal architecture: Unfavorable events in one location can be secured by resources in another
Demonstration Site – City of Cordova, AK

**Humpback Creek Hydroelectric Plant**
1250 kW (2 x 500 kW + 1 x 250 kW)  
17,000 foot UG and submarine transmission line

**Power Creek Hydroelectric**
6278 kW (2 x 3124 kW)  
25 kV transmission ties to Eyak Substation, Inflatable dams

**City of Cordova**
1,566 customers, 18 MW  
One Substation  
78 mi UG distribution lines

**Orca Power Plant**
10.8 MW Diesel Control Center, CEC

**Crater Lake Dam Storage**
may offset 25% Diesel consumption
Thank You
Questions?