

REopt Improves the Operations of Alcatraz's Solar PV-Battery-Diesel Hybrid System



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Project Goals:

- Reduce fuel consumption for Alcatraz's islanded power system

Existing System:

- Isolated power system with no interconnection to the California grid
- Located on Alcatraz Island in San Francisco Bay
- Owned by National Park Service (NPS)
- Construction completed in 2012
- Two 220-kW diesel engine generators
- 305-kW DC of solar photovoltaics (PV)
- 400 kW / 1,920 kWh of lead acid batteries

Findings:

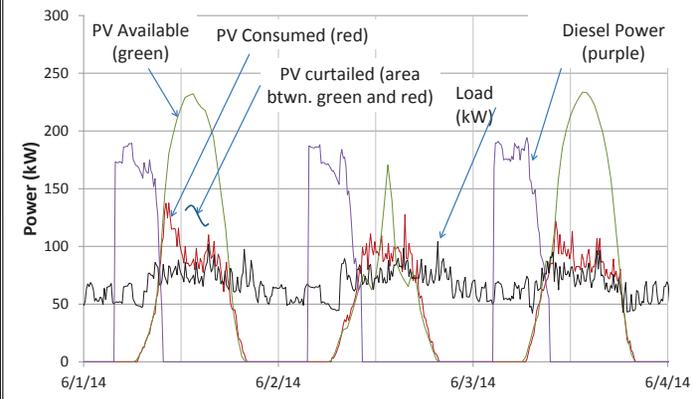
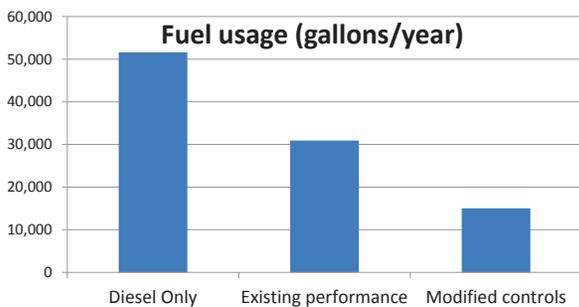
- "Cycle charging" strategy results in significant curtailing of PV, requiring excessive diesel use
- Strategy also incurs high wear on batteries without benefit of improved efficiency
- A simple "load following" strategy results in near optimal operating cost reduction



IMPACT

Improved operations strategy will:

- Reduce fuel consumption by 15,000 gallons per year, a savings of nearly 50%
- Reduce battery wear by about 1/3 per year
- Save \$115,000 per year on diesel + battery wear



Existing dispatch with excessive PV curtailment

NEXT STEPS

Work with NPS Alcatraz and system designer to:

- Implement revised control strategy
- Verify improved operations
- Develop battery replacement plan that specifies battery type, configuration, and size

PROJECT STAKEHOLDERS AND CONTACTS

Key Stakeholders:

- U.S. National Park Service
- DOE Federal Energy Management Program

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