Examining Microgrid Operation And Protection At The CERTS Microgrid Testbed

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Consortium for Electric Reliability Technology Solutions

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CERTS Microgrid Team

- Joe Eto, LBNL – Principle Investigator
- Bob Lasseter, Univ of Wisconsin – Technical lead
- John Stevens, Sandia National Labs – Project manager
- Northern Power Systems – Detailed design/test plans
- Tecogen/Youtility – Generators/Control Integration
- American Electric Power – Test bed host/constructor

Supported by

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Project Objectives

- Allow installation of DERs at optimum location for CHP
  - No need to electrically co-locate sources
- Have all millisecond-level control imbedded in DER
  - No need for communications for stability-related controls
- Protect sensitive loads from voltage sags and outages
  - ITIC/CBEMA or SEMI F47 criteria controls static switch
- Provide protection techniques for inverter-based DER
  - Inadequate fault current for conventional overcurrent protection

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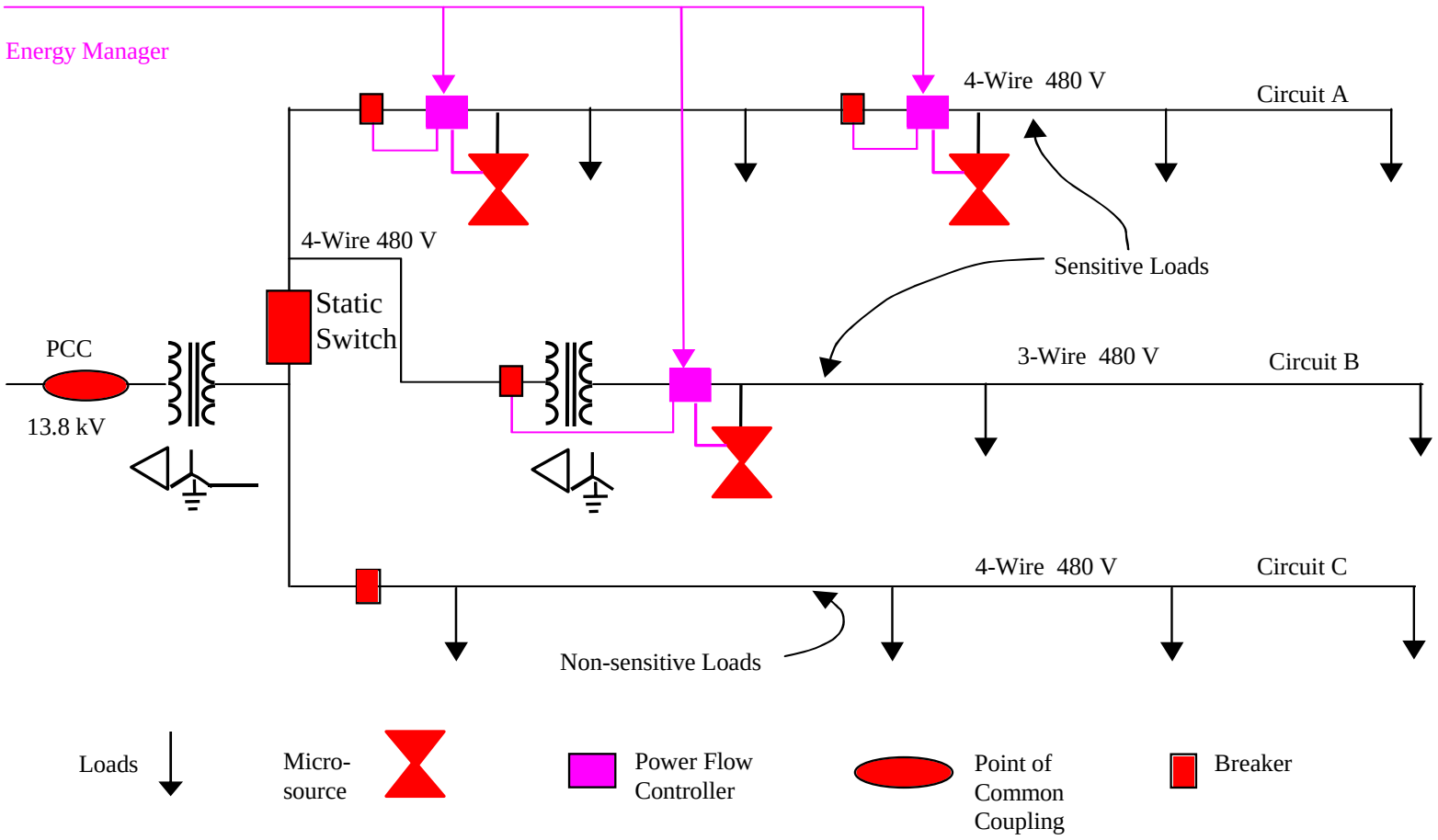
Conceptual CERTS Microgrid Design



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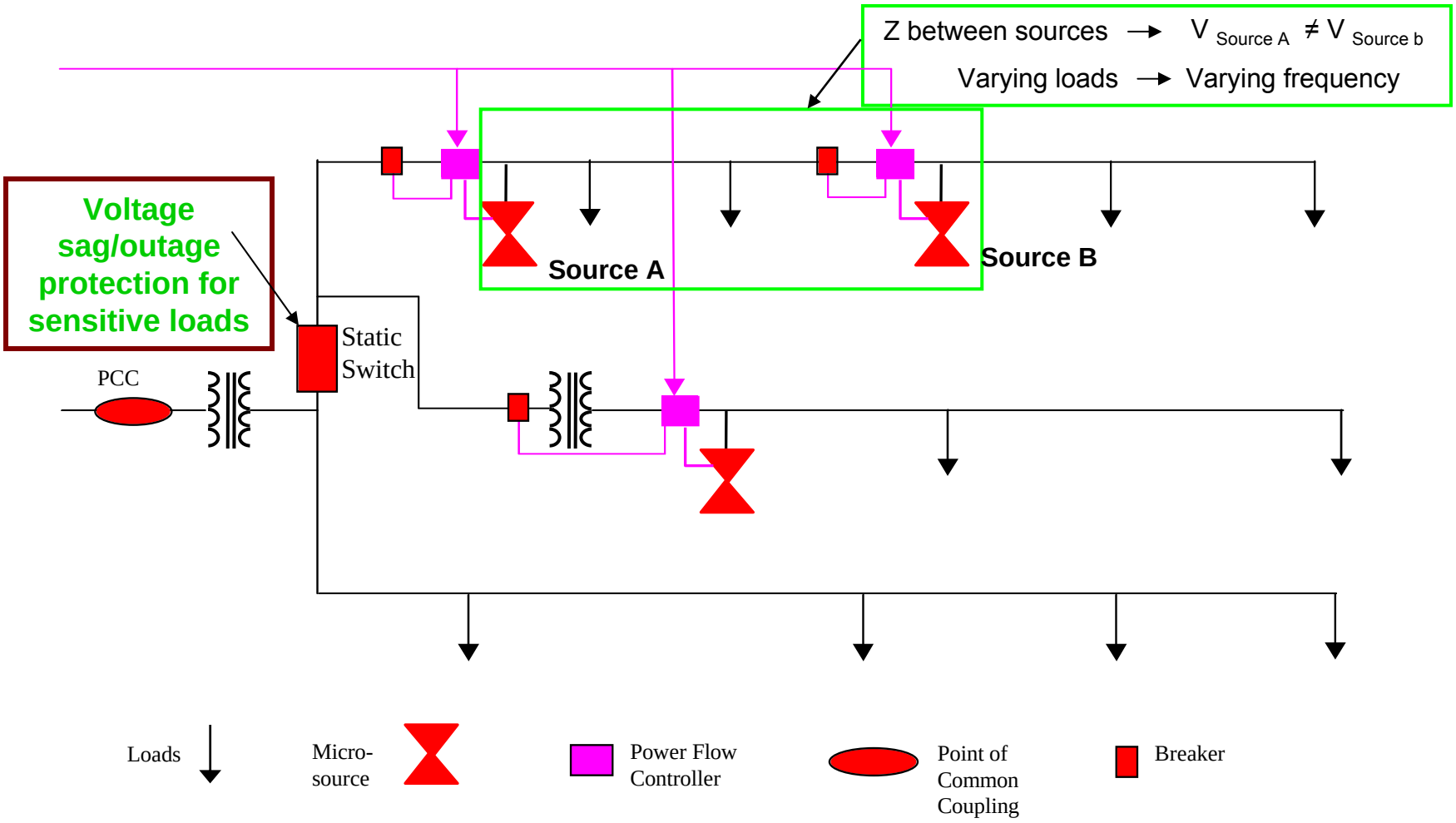
Details Regarding Design Objectives



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CERTS Microgrid Operation

- Grid-tied operation
  - Power dispatch (energy manager)
  - Peak shaving (energy manager)
  - Rapid response to utility sags/outages
- Islanded operation
  - Voltage control with droop (no communication)
  - Frequency control with droop (no comm.)
  - Automatic resynchronization upon normal utility

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Generation Trailer and Cabinets

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Construction Near Completion

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Input Side of Generator Trailer

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Output Side of Generator Trailer

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The Power Source

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Site Overview

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Progress

- Installation complete
- Commissioning underway
- Testing to begin mid-July
  - First phase expected completion Sept 1.
- Website with project information and test results to be established in August

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