Fuel Cells for Critical Power/Prime Power

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Sacramento, California

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• Three Real World Examples
  – First National Bank of Omaha
  – Fresno California Guaranteed Savings Building
  – Camp Pendleton Marine Corps Base

• First National Bank of Omaha
  – Four 200 kilowatt PAFC – 800 kilowatts total
  – Fuel cells are part of high availability critical power system
First National Bank of Omaha

- Largest "in house" merchant processor in United States
  - Top ten VISA® and MasterCard® processor
  - Top twenty automated clearing house processor

First National Technology Center

- First National Technology Center – Downtown, Omaha
  - 190,000 FT²
- 1,000,000 average daily credit card transactions
- 1,296,000 average daily banking transactions
- 43,500 average daily ATM transactions
- Estimated cost of downtime $6,000,000 per hour

Commissioned May 1999

- February 18, 1999
Customer Requirements

- Independent verification of 99.9999% system availability using Probabilistic Risk Analysis (PRA).
- Eliminate cascade and single points of failure.
- Seamless transfer from Grid Parallel to Grid Independent operation.
- Ability to perform maintenance on system without disrupting power to load.

Customer Requirements

- Fault clearing without grid: 10 -15 X rated current.
- Overload capability: 150% rated capacity for two minutes.
- Unlimited grid independent operation.
- Voltage regulation to critical loads: +/- 1% steady state.
Fresno, California Guaranteed Savings Building

- Three 200 kilowatt PAFC – 600 kilowatts total
- Combined Heat and Power with cooling
- Back-Up power capability

Fresno, CA Office Building
12 Story Commercial Office Building
GSA Lease -

IRS, Immigration and
DHS are the Major
Tenants

- 600 kW Electric
- 100 Tons Cooling
- 500,000Btu Heating

- Marine Corps Base – Camp
Pendleton
  - Two 250 kilowatt MCFC – 500
kilowatts total
  - Combined Heat and Power