Improving UPS Efficiency Using “Eco-Mode”

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Typical Uninterruptible Power Supply (UPS)
UPS Efficiency Drops as the Load Drops

Factory Measurements of UPS Efficiency
(tested using linear loads)
What is “Eco-Mode”?

• Use of UPS bypass except when inverter is actually needed

• Various names:
  – EConversion™ “advanced Eco Mode”
  – ESS (Energy Saving System)
  – SEM (Super EcoMode)
  – VFD (Voltage and Frequency Dependent)
  – Maximum Energy Saving Mode

• Switches from bypass to inverter mode in far less than a cycle
Example of UPS in Eco Mode response to power failure
How much does Eco-Mode save?

- Official number, estimated
  - 2-3% (based on design numbers)

- LBNL NERSC (ESS, ~30% loading): ~15% measured

- Other sites (based on actual loading and factory efficiency info):
  - A: 3% (11% with module shutdown, new UPS units, eco-mode)
  - B: 2% (5% with module shutdown and eco-mode)
  - C: 2% (8% with module shutdown, new UPS, eco-mode)

- Your mileage will vary!
LBNL NERSC Eco-Mode Experience

- ESS ("Energy Saving System")
- Required firmware upgrade, not cheap but very cost-effective
- 1100 kVA rating, one side of double-fed IT equipment
- Typical loading 25-50%
- Savings of 10-18%
- No problems (though no known outages)
What is “Advanced Eco-Mode”?

• Use of UPS bypass except when inverter is actually needed; inverter remains on

  – Less disruption to the waveform when there is a disturbance
  – Can act as harmonic filter
  – Slightly less savings than full Eco-Mode
Example of UPS in Advanced Eco Mode response to power failure

Outage Start

Inverter Operation

Schneider Electric
Questions
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