

Tools to Manage a Power Crisis

- Blackouts and Brownouts
 - definitions and causes
- The Risks
 - Impacts and effects
- The options
 - Mitigation and management

Tools to Manage a Power Crisis

- Practical considerations
- References/guides/standards
- Looking forward
- Summary and conclusions

Blackouts and Brownouts

- 1. Transients
- 2. Interruptions
- 3. Sag / Undervoltage
- 4. Swell / Overvoltage
- 5. Waveform distortion
- 6. Voltage fluctuations
- 7. Frequency variations

Impacts and Effects

- Immediate cessation
 - Lights off, Equipment stops, doors close
- Safety shutdowns – restart procedures
- Data corruption
- Long-term electrical stress

Mitigation and management

- The full “monty”
 - On-site generation
 - Energy storage – battery backup
 - Automatic control
- UPSs (Uninterruptible Power Supplies)
- AVR (Automatic Voltage Regulators)
- Load reduction / balance

Practical considerations

- Location of site – Ground floor is good!
- Physical space required
- Consents
- Level of redundancy justified – cost
- Complexity to operate
- Maintenance and testing
- Keeping pace with changes

References/guides/standards

- IEEE
- Uptime Institute
- UPS manufacturers' websites

Summary and conclusions

- Blackouts and Brownouts - don't let them spoil your day or night!
- They are inevitable
- Effects can be mitigated
- Detailed scenario planning is required
- Some quick gains are possible
- Key part of business continuity