Monitoring Systems Reliability

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Methodology

- Develop a "Owner Design Requirement"
 What is the intent of the system that will be controlled and monitored?
 What sources of reliability are available to support these systems?
 Develop a schematic design of the intended
 - system
- Perform and fault analysis on the monitoring and control system



Key System Features

Monitoring Stations

- Who needs to be able to do what?
- Any remote connectivity required?
- Remote alarming
- Trending capability
- Historical data recording/archiving
- Scheduling requirements
- Reporting capability
- Operator interface (graphical presentation)



Key System Features

- Control and Monitoring Panels
 - What functions will they perform?
 - Can they be shared between units or system?
 - What individual redundancy is required at the panel?
 - Processor
 - Power Supply
 - Network connectivity
 - What will happen if a panel component fails?



Key System Features

- Communications Network
 - What connectivity will be available within a structured cabling system?
 - Are dual network connections required?
 - Can "looped" network fulfill our needs?
 - Redundancy requirements of any router/repeaters



Case Study SBC Data Center

- 400 g.s.f data center
- Supports SBC system wide
- 400 KSF raised floor data center for SBC Communications. One of SBC's three major data centers
- Facility comprises:
 - Three 2,400 kW UPS
 - Computer equipment is supported by 28 600 Amp static transfer switches
 - 2000 Tons of AC
 - Six 2 MW standby generators paralleled with one 2 MW unit being redundant
 - Planned central plant comprises a total 7400 tons of chiller capacity and 14-600 ton cooling towers.

sulting, Inc.





Case Study – AMN AMRO Bank

♦ 1.3 Million g.s.f. Downtown Chicago Podium – Levels 2-8 Data Center Trading Floor Check Processing Mail Distribution Cafeteria, Health Club, Security Tower – Levels 9-29 9-14 High Reliability 15-29 Normal Office





Case Study – AMN AMRO Bank

- Dual/split capability central mechanical plants
- Dual chilled water distribution
- Unitized mechanical system in critical areas
- Dual power feeds to site
- Dual water feeds to site
- Dual UPS provisions throughout





Industrial vs. Commercial Solutions

- Industrial
 - PLC based
 - Electrical monitoring
 - High reliability for simple control schemes
 - Dynamic simulation

- Commercial
 - Commercial Controls
 - HVAC control & monitoring
 - Electrical monitoring
 - Good reliability for complex Mechanical Schemes



Commissioning

What is Commissioning?

- Development of Owner's Project Requirements (OPR)
- Systematic testing, verification and documentation of all components operations
- Systematic testing, verification and documentation of all <u>systems</u> and their <u>interactions</u>



Why Commission

- Ensure delivery of the OPR
 Optimize operations
 Find any problems before the reliability of the system will be tested in a live situation
- Set a base line of operation for the future
 - future



Re-Commissioning

When does it need to be done

What needs to be re-commissioned



