

Hospitals & Electrical Reliability



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York Chan, CHFM, CHC, SASHE
Vice President, Facilities Services
York.Chan@advocatehealth.com



Advocate Health Care

- **System of 12 acute care hospitals in Illinois**
 - 356 Sites of Care including 7 Trauma Centers
 - 15 Million sq. ft. of healthcare occupancy
- **2017 – Energy Consumption**
 - 231.4 Million Kilowatt Hours of Electricity
 - 12.2 Million Therms of Natural Gas
- **Sustainability and Energy Focus**
 - Full time Sustainability Director and Manager
 - Full time Energy Manager
 - 2.1% reduction in consumption from 2016 to 2017



Caring for Your Health & the Health of the Earth

"Advocate recognizes that sustaining the health of the environment is critical to preserving human health. With a deeply rooted commitment to our mission, values and philosophy, we are driven to be good stewards of all our resources, including the earth."

Jim Skogsbergh,

President and CEO Advocate Health Care

Hospitals & Electricity

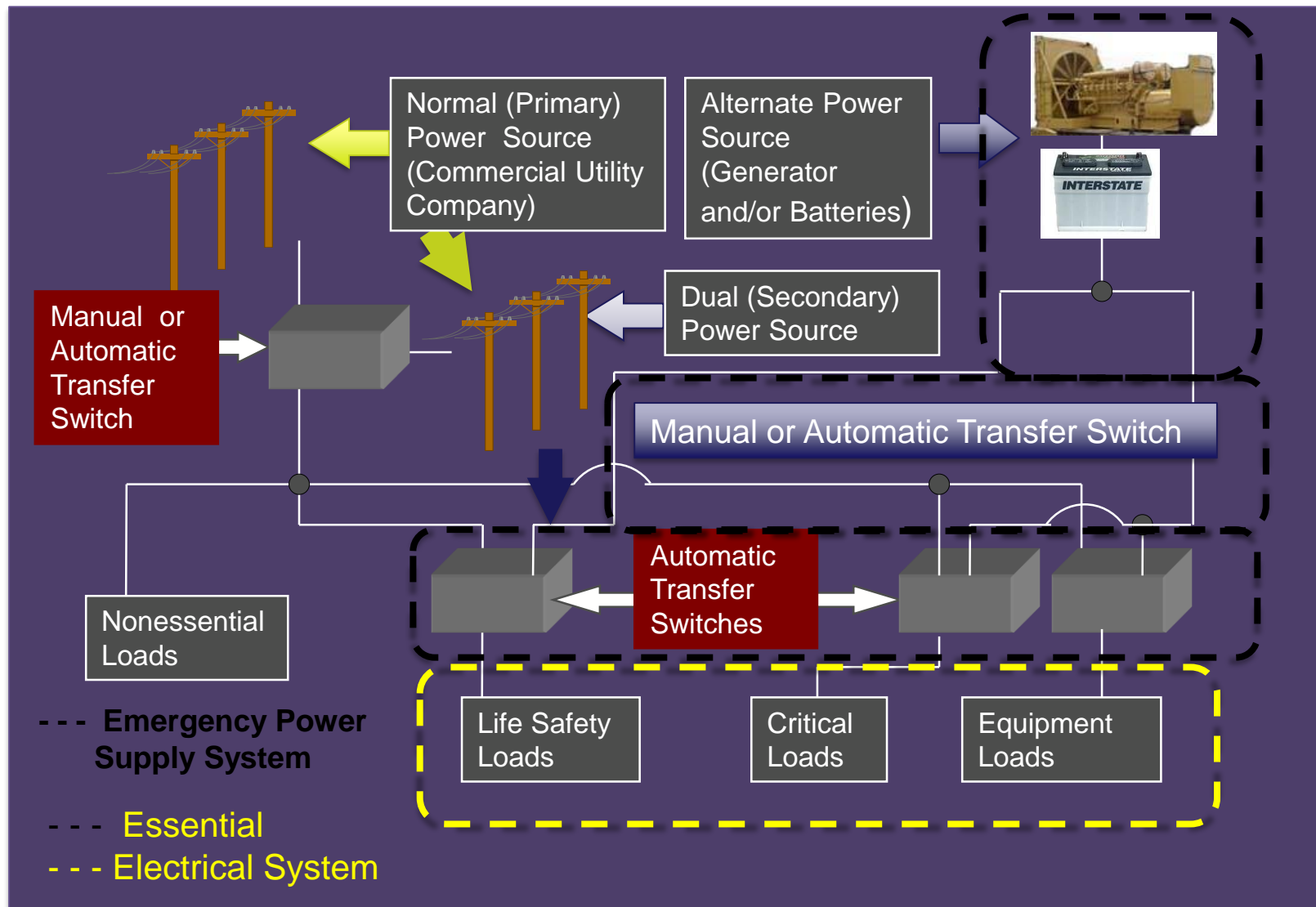
- Hospitals use 2.7 times more energy than a commercial office building
 - Average U. S. hospital consumes about 260,000 btu's per square foot*
 - Average European hospital consumes about 150,000 btu's per square foot
- Hospitals are not in the power generation business – that is not our core function
 - A few have ventured into alternative and renewable energy sources

* US Dept. of Energy

Electrical Reliability

- Number 1 concern for Healthcare Facility Managers is the lost of electricity!
- Technology has advanced so much over the past decades in medicine and a majority of them are equipment related
 - Robotic surgeries
 - Remote diagnostics
 - Remote monitoring of patient vitals
 - Care of neonates
 - Heart/lung bypass machines

Electrical Systems

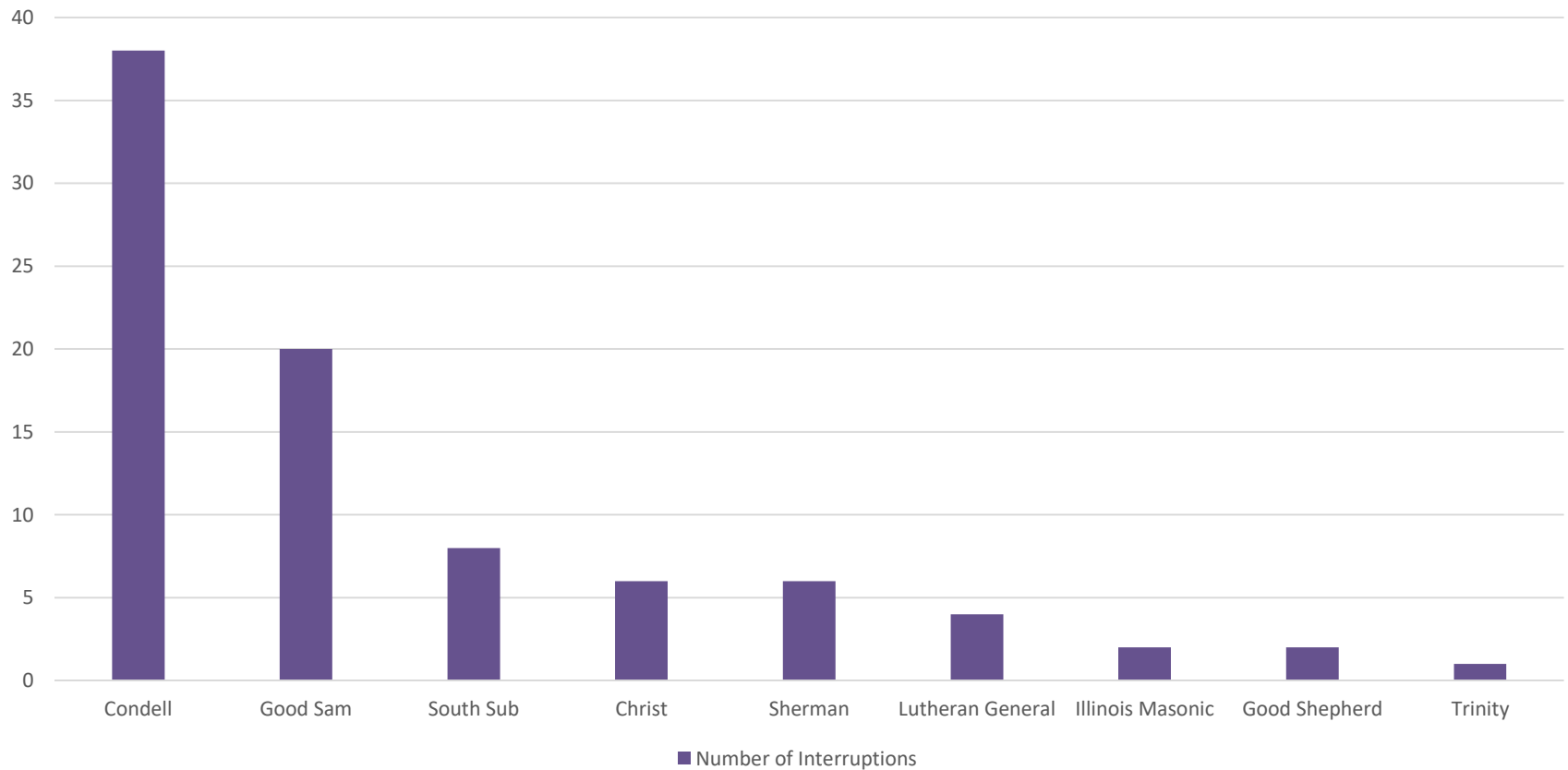


Electrical Reliability

- High tech equipment are very susceptible to power bumps, spikes and voltage fluctuations
- A lot of equipment go into a self check mode, delaying restart for a period of time, thus jeopardizing life support
- Building support equipment shut down and negatively impact environmental functions
 - Room pressurization relationships
 - Room temperature and humidity parameters

System Power Outages Jan 2016 – Feb 2017

ComEd Interruptions by Hospital



Clinical Outcomes

- Maintaining the “Environment of Care” is crucial to successful clinical outcomes
 - Air pressure differentials
 - Temperature/Humidity parameters
 - Air exchanges
- Clinical outcomes impact how hospitals are paid
- Patient satisfaction also impact financial reimbursements

HOSPITAL ACQUIRED INFECTIONS

- Every year, 1.7 Million people contract Hospital Acquired Infections* (HAI's)
- 74,000 People died a year from HAI's – 2014 data*
 - Doing better - 99,000 deaths in 2010*
- What is at stake?
 - Patients that acquire Hospital Acquire Infections stay an extra 6.5 days
 - An additional \$35 Billion in healthcare costs
 - Five times more likely to be readmitted with complications
 - Twice as likely to **DIE**

* Center for Disease Control

HOSPITAL ACQUIRED INFECTIONS

- Number of deaths equivalent of two 747's crashing every week!
 - The aviation industry doesn't tolerate it!
 - Why should healthcare?



The Physical Environment and HAI's

- Air pressure relationships
 - Air shall always migrates from clean to “less clean”
 - Surgery (positive)
 - Protective Environment (positive)
 - Critical and Intensive Care (positive)
 - Airborne Infectious Isolation (negative)
 - Soiled Utility (negative)

The Physical Environment and HAI's

- Temperature/Humidity Parameters
- Patient Room Temperatures directly impact patient satisfaction
 - Impacts patient satisfaction which affects reimbursements
- Operating Rooms
 - Peri-surgical patients body temperatures have an impact on surgical site infection rates

Summary

Regardless of how a hospital is supplied electrically, whether from a micro grid or a traditional grid, the most important factor is the reliability and quality of the electrical feed!