

ASCO Case Studies in Excellence : Six Hospitals Share Their Experiences



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Network Power

Armand Visioli
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ASCO Power Technologies



Consider It Solved

The nationwide trend of healthcare facility expansions, upgrades, new construction and more intense crisis preparedness is stretching the engineering resources of many hospitals, trauma centers and clinics.

Decision makers are expected to understand and evaluate new technologies for a facility's growing operations.

That's on top of ongoing responsibilities such as satisfying reporting requirements. Protecting life safety and critical operations. Keeping power on for

important revenue producing services. And managing energy demand and staff.

We know many of the challenges confronting you because our personnel work every day with technicians, maintenance staff and engineers at healthcare facilities. Whether our customers are with hospitals, clinics or other facilities, they enjoy ASCO's full corporate commitment to support their emergency power needs. It's a commitment that comes from the highest levels of the business—including my office—to devote the resources necessary to anticipate and respond to

your evolving needs. That includes quality products and 24/7 service.

You can depend on long-term and reliable relationships that we build with trust and cooperation. And you can benefit from our ongoing innovations in power transfer technology. ASCO's technological leadership produces the most reliable transfer switches for protecting life safety, critical and equipment loads.

Let us show you how we can help. E-mail us at healthcare@asco.com.

Armand Visioli, PE



When the stakes are high, healthcare decision makers turn to ASCO Power Technologies.

ASCO Power Transfer
Switches and
Power Control Systems

Specifying Peace of Mind

Hospitals Want Quality Products, Expert Service, Reliable Relationships and Long-Term Commitment

Peace of mind is why hospitals, trauma centers and clinics in North America and around the world specify ASCO Power Transfer Switches and Power Control Systems for their emergency power supply systems.

In fact, a majority of healthcare facilities in the United States have ASCO Power Transfer Switches.

Nearly 100,000 ASCO Power Transfer Switches installed in those facilities help keep power on whenever the utility source fails.

Healthcare management and their consul-

ants know that selecting ASCO is a decision they can depend on for 20 years or more. That's why they prefer and depend on ASCO Power Technologies.

They rely on ASCO's comprehensive product portfolio, deep expertise built on more than a century of innovation, real time communications capabilities and responsive 24/7 service.

They're secure with the deep resources that ASCO can provide them as part of the global Emerson Network Power business.

So when they want to resolve the issue of emer-

gency and standby power systems, they solve it with ASCO because ASCO is the solution.

From practically every continent on earth, hospital decision makers and their consultants are choosing ASCO. And when they do, those facilities get properly tested, commissioned and maintained power transfer switches and engine generator paralleling systems. Plus, they know ASCO provides field product upgrades with the latest technology.

Six decision makers share their experience with ASCO Power technologies on the following pages. They are Kevin Deitsch of St. Joseph Hospital in Denver, Colorado, Yiorgos Andritsakis of UCSF/Mt. Zion Medical Center in San Francisco, California, Roger Friesen of Methodist Hospital in Minneapolis, Minnesota, Bill Pitts of Madigan Army Medical Center in Ft. Lewis, Washington, Jim DeStefano of Altoona Hospital in Altoona, Pennsylvania, and Bill Harris of Saint Clare's Hospital in Denville, New Jersey.

CHALLENGE Centralize and update the hospital's emergency power and control system to improve power reliability for critical and noncritical loads, and to accommodate steady growth.

SOLUTION Install three, 1500 kW engine generators and arrange for supplemental portable generation. Transfer power and control the overall system with nine ASCO 7000 Series Closed Transition Bypass-Isolation Transfer Switches, an ASCO SYNCHROPOWER® Control System and PowerQuest® monitoring.

Saint Joseph Creates Premier



St. Joseph Hospital in Denver, Colorado created a premier emergency power system that can power the entire hospital for extended periods.

“We wanted to centralize operations in a single plant and be able to power the entire campus for extended periods with no utility feed, if necessary.”

Kevin Deitsch, electrician



Kevin Deitsch, electrician at St. Joseph's, monitors performance of the hospital's emergency power systems via ASCO PowerQuest®.

Emergency Power System

The 350-bed hospital in Denver, Colorado had expanded and so did its emergency power and control system. The system had become decentralized—multiple pieces of independently operated equipment.

The hospital formed a project team that included its electrical department, the consulting engineering firm of Cator, Ruma & Associates and ASCO's sales representative, Power Control Products.

The team created one of the premier emergency power control systems in the Rocky Mountain region. The new system comprises three, 1500 kW gen-sets and arrangements for portable generation. Together with utility power, the hospital now has four power sources. That means all power sources would need to fail simultaneously—an unlikely event—for the hospital's most important loads to be without power.

To transfer power and control the overall system, the hospital chose ASCO because of its innovative power transfer technology, automated control capabilities, ASCO Services 24-hour on-call service, parts availability and multiple installations in metropolitan Denver.

The hospital selected nine ASCO 7000 Series Closed Transition Bypass-Isolation Transfer Switches and an ASCO SYNCHRO-POWER® System to coordinate the gen-sets and transfer switches.

When at least two power sources are available, the transfer switches seamlessly transfer power and provide additional control redundancy because their loads can be manually transferred to either utility or on site power as needed.

Synchropower satisfies the hospital's criteria for a control system that includes load demand, bus optimization, DC to DC converters for control power and a sophisticated SCADA system.

The hospital married its SCADA system—ASCO PowerQuest®—with the automatic transfer switches, engine-generators and its building automation system to monitor alarm points in real time. When set points aren't met, the system sends an alert to a facility computer and pages engineers.

The system also provides the information required for the JCAHO inspector to review as required by code.



The University of California at San Francisco Mt. Zion Medical Center enjoys a reliable emergency power system that will perform reliably for the next two decades. The center is one of the nation's top 10 cancer research centers.

CHALLENGE

Modernize the medical center's emergency power system to enhance its reliability and flexibility.

SOLUTION

Upgrade the emergency power system's power control system with superior technology that helps staff ensure continuous power to priority loads.

"The upgraded system is superior to what we had before."

Yiorgos Andritsakis, assistant chief engineer



Yiorgos Andritsakis, assistant chief engineer at UCSF Mt. Zion Medical Center, said the upgraded power control system allows them to shed load in stages.

UCSF/Mt. Zion Boosts Controls

The Mt. Zion Medical Center at the University of California at San Francisco operates its emergency power system more frequently and with much greater control since it upgraded its power control system.

Besides the control system, the emergency power system comprises 11 bypass-isolation transfer switches and three engine-generators.

The transfer switches can be inspected, tested and maintained without interrupting power to protected loads.

Of the three engine-generators, one is rated at 350 kW, and the other two are 260 kW rated units.

“We now can prioritize loads within our three priority load levels,” said Yiorgos Andritsakis, assistant chief engineer at the campus of more than 20 buildings.

For example, rather than transferring all loads within priority three as a single block, they can be transferred in stages.

ASCO Services designed, installed and tested the upgrade, which performed flawlessly when power failed unexpectedly.

“Last year, when the main breaker tripped, the generators started and all protected loads transferred over,” Andritsakis said. Good performance derives from a reliable emergency power system and stringent testing.

The engineering staff puts the system through its paces weekly, rather than monthly. Every Tuesday morning the staff starts the engine-generators then signals for the transfer of all

priority loads. The engine-generators run under full load for 30 minutes, then the units come off line one by one, cool down and then shutdown after a brief verification check. The entire test lasts 45 minutes.

The transfer switches and power control system are serviced yearly by ASCO Services, which also responds in case of emergency.

“Upgrading the power control system has been one of the more successful projects here,” Andritsakis said. “We have a lot of confidence that the emergency power system will perform reliably for the next 20 years. We’re 100 percent satisfied.”

Madigan Eliminates

CHALLENGE

Conduct mandated emergency power system tests without getting “nasty phone calls” from medical personnel because of power interruptions.

SOLUTION

The hospital converted open transition transfer switches that protected critical loads to closed transition, which connects with one power source before breaking with another.



Engineering staff at Madigan Army Medical Center at Ft. Lewis, Washington now can

test the entire emergency power supply system and not create a power interruption

during testing or retransfers to the utility source.

Momentary Power Interruptions

Conducting NFPA 110-mandated monthly tests of its emergency power system caused momentary power interruptions at the 414-bed Madigan

Army Medical Center at Fort Lewis near Tacoma, Washington. Sensitive electronic equipment often would need to be rebooted.

During controlled transfers from the live utility source to the hospital's five, 850 kW engine-generators and back, the hospital's 29 open transition transfer switches would break one connection before making the other.

The ASCO switches performed according to spec from the beginning. However, facility engineers frequently received complaints about the interruptions, so the hospital decided to convert eight of the transfer switches that protected the most critical loads to closed transition. The closed transition type automatically eliminates

momentary power interruptions by connecting with one power source before breaking with another when both sources are available. When utility power fails, the transfer switch controller automatically provides an open transition load transfer.

ASCO Services, coordinating with the company's sales representative, S.F. Griggs of Redmond, Washington, managed the conversion and assumed all responsibility for a turnkey project, including installation, start-up testing and user training. Madigan's engineers were so pleased with the results that they contracted ASCO Services to convert the remaining transfer switches to closed transition type.

Now, all 29 transfer switches, 16 of which also include bypass-isolation capability, are the make-before-break type. Testing is conducted during peak hours with no transfer-induced power interruptions during testing or retransfers to the utility source. ASCO paralleling switchgear controls the engine-generators.

Electrical Branch Chief Bill Pitts reports that his people now test the entire emergency power supply system with confidence. "The tests are transparent to our medical personnel," he says, "we no longer get those nasty phone calls when we test."

The converted ASCO switches have performed so satisfactorily that 14 ASCO closed transition transfer switches have been installed in Elmendorf Army Medical Center in Anchorage, Alaska. They also have been selected for the Basset Army Hospital near Fairbanks, Alaska. And when a previous Madigan engineer began working at Valley Medical Center in Renton, Washington, he installed 10 ASCO closed transition transfer switches for a new wing.

Altoona Curtails Load



Jim De Stefano, assistant director and project coordinator of Maintenance at Altoona Hospital, has high confidence in the ability of the hospital's emergency power system to help reduce utility bills through a load curtailment program.

“The investment the hospital made by upgrading the system has paid off immensely.”
Jim De Stefano, assistant director

CHALLENGE
Take advantage of a utility load curtailment program to reduce utility bills.

SOLUTION
Use the hospital's upgraded emergency power system to shed load from the utility source during periods of peak summer demand.

An upgraded emergency power system protects Altoona Hospital in Altoona, Pennsylvania against power outages typically caused by storms and traffic accidents.



System upgrade reduces utility bills and provides for full-load testing.

Altoona Hospital in Altoona, Pennsylvania wanted to reduce its energy bill so after upgrading its emergency power system it agreed to participate in its utility's load curtailment program.

The utility can and does call on the 346-bed hospital during summer peak load demand to shed load from the utility grid. Altoona gets two hours' notice to reduce its demand by a certain kW amount and it meets that requirement by shedding its chillers from the utility source. Staff starts the

generators and transfers the load seamlessly using its ASCO Closed Transition Transfer Switches.

"There's no break in power," said Jim De Stefano, assistant director and project coordinator of maintenance. "People don't even see it." The transfers are 'invisible' because closed transition transfer switches eliminate momentary power interruptions by connecting with one power source before breaking with another.

They also don't see transfers conducted during the hospital's monthly testing procedures. Rather than running the emergency power system tests at night for 30 minutes, the maintenance staff operates the system during the day for a full eight hours and transfers

the hospital's entire load to the on site engine-generators.

"We load them up and let them run during the peak of the day because we believe that maximizes engine life," explained De Stefano.

It's obvious that the maintenance staff has a lot of confidence in its emergency power system.

"We're very secure that whether utility power is interrupted intentionally or not the system is going to perform," he said.

That confidence is a result of Altoona Hospital upgrading its emergency power system. It refurbished its two engine-generators and installed two new ones. All four are rated at 900 kW capacity. Three satisfy the

hospital's entire load, including chillers, and the fourth serves as back up.

The upgrade also included adding ASCO power transfer switches and power control systems to manage the doubling of on site generator capacity.

ASCO, its area sales representative Continental Sales and the engine-generator manufacturer teamed up as a single source supplier.

The upgraded system comprises the engine-generators and 28 ASCO low voltage and medium voltage power transfer switches and a power control system. ASCO Services helps maintain and monitor them.



Methodist Monitors 'Plug In' Loads During Real Outages

The 450-bed Methodist Hospital in Minneapolis, Minnesota uses ASCO Power Transfer Switches, a power control system and Power-Quest® monitor to get critical load management information.

CHALLENGE

One of the nation's top 100 hospitals wanted to precisely track priority loads to ensure that its emergency power system could handle the extra demands of a power outage and expanding load priorities.

SOLUTION

Upgrading its 26 automatic transfer switches with an ASCO 7000 Series Controller and Power Managers provide the hospital with real time load management information to engine-generators and power transfer switches. The hospital knows exactly how much load is on each engine-generator and transfer switch every second.

“There’s a big difference between conducting monthly PM testing and a real power outage,” said Roger Friesen of Methodist Hospital in Minneapolis, Minnesota.

“During a real outage, people plug into emergency circuits,” he explained. And with 400-500 of those outlets in the 450-bed hospital, there was no way to calculate how much load that added, so Methodist oversized everything in its emergency power design criteria.

“The last thing we wanted was a transfer switch on overload,” Friesen said.

To better manage the situation, the hospital upgraded its 26 ASCO automatic transfer switches, most of which have bypass-

isolation capability. ASCO Services installed the ASCO 7000 Series Controller and Power Managers on the transfer switches to provide precise information on the four priority loads that are assigned to the hospital’s three, 600 kW and one, 450 kW engine-generator. The upgrade went smoothly, with zero down time.

“Now we get a history on outages and know how much additional load is plugged into emergency circuits,” Friesen said. “We can tell whether it’s unloaded or loaded and if it’s loaded, we know the exact amount of load.”

Another benefit is that as the hospital steadily expands, it monitors the amount of load assigned

to each engine-generator, which guards against overloading. When load approaches a predetermined level, they know to add a transfer switch.

Staff no longer needs to visit six transfer switch locations to gather information. It’s readily accessible from the hospital’s PowerQuest® monitor and SYNCHROPOWER® Power Control system. A digital display provides real time data on amperage, voltage and phases and can alert staff when conditions are not within preset limits.

“Step-by-step, user-friendly instructions on the display are a big help,” Friesen said.

Friesen summed up what he likes best about the hospital’s transfer switch and power control system in one word: “Reliability.”



Roger Friesen of Methodist Hospital in Minneapolis, Minnesota led a team that evaluated automatic transfer switches for the hospital. “We selected ASCO because its technology is farther along and because of its factory and personnel.

“A big reason we upgraded the transfer switches is to monitor loads remotely.”

Roger Friesen, assistant director of Engineering

Saint Clare's Cures



CHALLENGE Replace a failed transfer switch that served life safety and critical loads STAT, while continuing to protect the loads.

SOLUTION A team of hospital staff, an electrical contractor and ASCO isolated the switch to protect its loads, then removed and replaced it with an ASCO 7000 Series Power Transfer Bypass-Isolation Switch over a weekend.

Transfer Switch Fever

Competitor's switch starts smoking, then goes cold turkey.

"On Thursday afternoon, we saw smoke emanating from the existing transfer switch," said William Harris, senior engineer at Saint Clare's Hospital in Denville, N.J.

An infrared scan showed the switch suffered a 'fever'...an internal connection on the bus bar had overheated and melted dielectric material. The 480V, 800 amp automatic transfer switch had been provided by another company and had served such loads as operating rooms, radiology and a significant part of the hospital's MIS data center.

After Harris and Maintenance Manager Brian Vivo saw the scans they knew there was no saving this 'patient.' Its bout with hot-bus fever proved fatal because the switch wasn't repairable. They would have to replace it and soon. To buy time, they started isolating the switch to protect its loads.

"We essentially created our own external bypass around the switch with a lock-out tag-out system," Harris explained. "One breaker fed the normal side of the transfer switch and one breaker fed the emergency side. We padlocked it to prevent inadvertent operation."

The hospital's electrical

contractor, Linear Electric, suggested Harris contact ASCO because they were nearby and because their transfer switches had a reputation for reliability.

"We really lucked out," Harris recounted. "ASCO had what we needed on the manufacturing floor."

While the company prepped and shipped the transfer switch—an ASCO 7000 Series Power Transfer Bypass-Isolation Switch—Harris, Vivo, Cliff Blewett and the contractor began removing the failed switch.

The new transfer switch arrived promptly on Saturday evening and the team installed it by first thing the next morning. Work continued through the day and night and by Monday morning, the transfer switch was ready for commissioning.

"ASCO personnel were here from the beginning to help install the new transfer switch and stayed until we terminated the last wire," Harris said.

If the bypass-isolation feature had been included on the original switch, hospital staff could have manually bypassed power to the load just by rotating a handle and without cabling breakers.

"It's nice to have a saint in front of the hospital to watch over us," he said.



Cliff Blewett, electrician at Saint Clare's Hospital, was part of a brain trust of hospital engineering staff, an electrical contractor and ASCO that quickly replaced a competitor's failed power transfer switch. He is standing next to an ASCO Bypass-Isolation Power Transfer Switch.

Codes, Testing And Automated Recording

The real world of complying with emergency power standards and passing audits too often means that personnel spend many hours operating systems and recording data manually.

Weekly inspection sheets for an emergency power system, for example, can include 55 or more data points and require writing comments in long hand. Monthly testing logs can have nearly 40 or more data points. A third form, a generator load report, builds the pile of necessary paperwork.

It's no wonder that errors can and do occur. And errors can potentially affect a healthcare facility's JCAHO accreditation and create liabilities.

A solution to testing emergency power systems more efficiently is to automate the testing procedure and data recording. Automating the process facilitates compliance, substantiates insurance claims and defends against litigation arising from potentially life-threatening events. It also helps manage the facility's energy consumption more effectively.

An automated Web-based communications system—PowerQuest®—integrates the operation of monitors, controls, multiple engine-generator paralleling systems and automatic power transfer switches.

PowerQuest® remotely exercises engine-generator systems and automatically logs data on the exercise.

It also conducts transfer tests that simulate a power failure, start the gen-set, transfer power to the alternate power source and run the generator under load for the period specified in the standards.

It then retransfers back to normal power and runs the generator through cool down. The system monitors the engine-generators continuously through the test and automatically records mandated readings.

Automated testing and recording capabilities also include the ability to select from seven automatic test schedules. Code references for NFPA 99 emergency power systems testing are included.

A controller stores up to 99 events with time and date stamping and an optional printer interface produces hard-copy documentation.

An ASCO Power Manager measures single and three phase power systems in real time. The bottom line is an integrated emergency power system that better equips healthcare facilities operations and engineering staffs to meet the requirements of JCAHO, NFPA 110 and NFPA 99.



What healthcare facilities want most from automated testing and recording

- Accurate test run data in tailorable formats.
- Storage of historical data to use for satisfying JCAHO documentation requirements
- Logging and time stamping of power system anomalies so the cause and origin (utility source or on site generation) can be determined
- Hands-free operation of testing procedures
- Scalability to grow—or change—according to the facility's needs
- Web-enabled, password-protected access for true remote monitoring

Expert, Tailorable, 24/7 Service

The most common cause of transfer switch failure is lack of regular maintenance.

Because power failures can be life-threatening and costly, there is no room for error when it comes to maintaining a transfer switch.

Trained ASCO Services technicians properly maintain and test transfer switches and power control systems for hospitals coast to coast. They are available around the clock in most areas and parts can be on site in a matter of a few hours.

Two levels of maintenance programs can be customized to meet the needs of one facility or many networked facilities across the country.

Level One includes annual scheduled maintenance during or after busi-

ness hours, a discount on parts and a reduced hourly rate for additional labor that might be required.

Level Two includes Level One service, plus all parts, labor, expenses and emergency service calls. Emergency service is dispatched 7/24/365.

ASCO Services services a range of transfer switches from a variety of manufacturers. Technicians resolve problems created by corrosion, evidence of overheating, contact erosion and other causes.

Besides maintaining equipment, ASCO Services can design, install and upgrade power transfer switches and power control systems.

Maintenance Check List

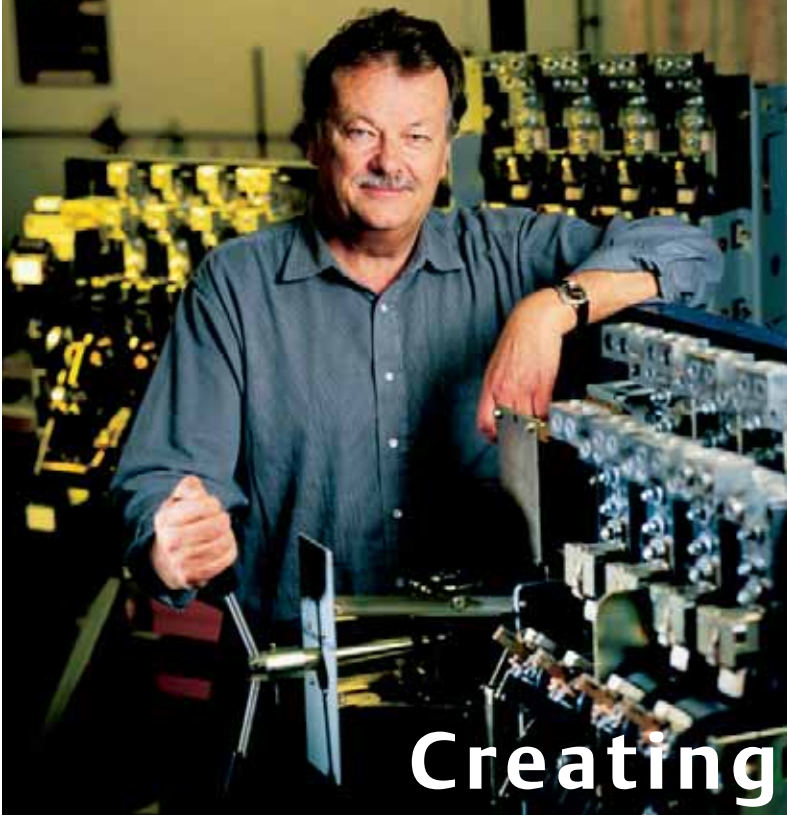
- De-energize the switchgear and engine start signal
- Secure and lockout normal emergency disconnects
- Remove the arc chutes and pole covers
- Test and recalibrate all sensing and time delays
- Vacuum clean accumulated dust
- Inspect for moisture or signs of wetness or dripping
- Remove grime
- Clean and lubricate transfer switch coil and operator linkage
- Inspect all insulating parts for cracks and discoloration
- Inspect all main arcing contacts for excessive corrosion
- Inspect current-carrying contacts for pitting, discoloration
- Inspect all control relay contacts for excessive erosion and discoloration
- Inspect and clean all accessory panels
- Manually operate the main transfer movement
- Check all cable and control wire connections
- Electrically test all power sensing and time delays
- Reconnect engine start
- Re-energize the switchgear and test it by simulating a normal source failure
- Submit computer-generated report



An ASCO Services technician checks operation of a multiple engine-generator paralleling system with a laptop computer. The computer tests multiple components quickly and accurately and can send maintenance results to a printer for hard-copy documentation. Upgrading power control systems without requiring system shutdowns is another ASCO service.



Fully stocked vans support ASCO Services technicians during on-site visits, often eliminating the need to order parts.



Creating Innovation

Roland Josenhans, manager of Product Engineering, worked on the team that developed an advanced power transfer switch design.

Ron Schroeder, product manager, Power Switching and Controls, helped expand the functionality of the power transfer switch controller.

Satisfying the needs of hospital decision makers is one reason why ASCO Power Technologies is the number one manufacturer of power transfer switches on the planet.

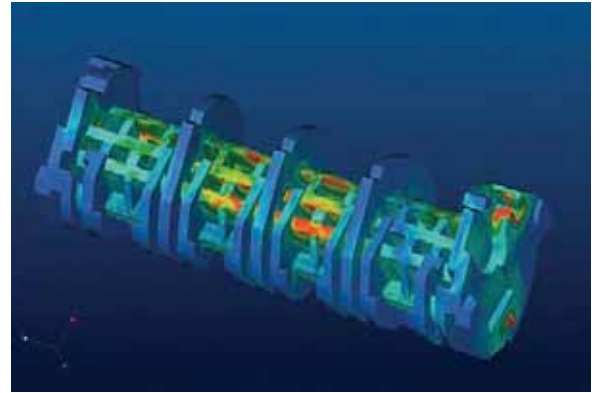
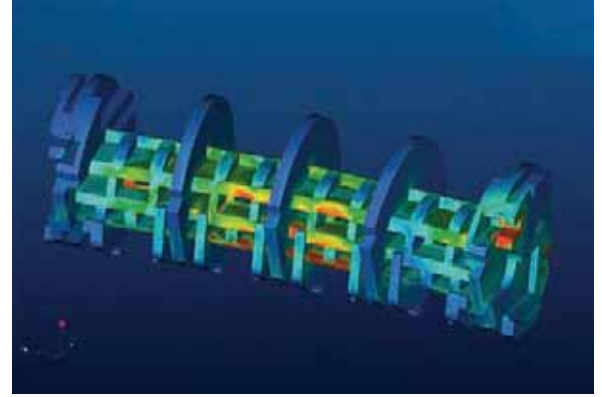
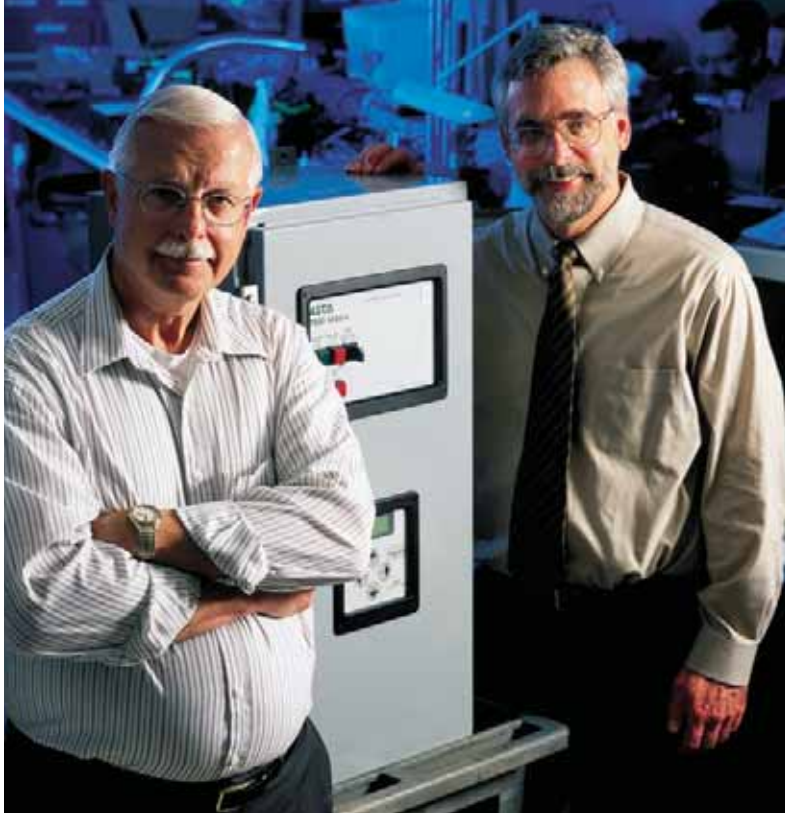
Reliability is what healthcare engineering departments and facilities directors want most in automatic transfer switches. Reliability means the difference between a night spent resolving problems or sleeping soundly.

Reliability is a product of innovative and proven design, configuration flexibility, quality, ease of operation and serviceability. ASCO Power Transfer Switches deliver it all.

For more than a century, every major advance in power transfer switching and control design and development has come from ASCO. ASCO pioneered the world's:

- First automatic transfer switch in 1920
- First solenoid operated transfer switch
- First 1200 ampere transfer switch

- First solid state automatic power transfer switch control panel
- First microprocessor automatic power transfer switch controller
- First 1600 and 2000 ampere transfer switches
- First overlapping switched neutral
- First inphase monitor and first advanced, self-regulating inphase power technology
- First 3000 and 4000 ampere transfer switches
- First power transfer and bypass-isolation switch
- First two-way bypass-isolation transfer switch
- First automatic bypass-isolation transfer switch with draw-out design for serviceability
- First closed transition transfer switch
- First high-speed power transfer switch
- First three cycle "any breaker" withstand and close-on current rating capability
- First closed transition soft load power transfer switch qualified and listed to UL 1008
- First 18- and 30-cycle withstand current rating for transfer switches
- First power manager with embedded I/O and kW command and control
- First communications and data-logging capability for transfer switches
- First Ethernet/Web enabled connectivity for transfer switches
- First U.L. approved, CEmarked, IEC 60947-6-1 compliant and third-party Kema Keur marked automatic transfer switch
- First true service entrance transfer switch that



Walter Przywozny, manager of Switch Controls Engineering, (left) helped make the controller more user friendly. Daniel Scheffer, vice president of Engineering and Technology, oversaw the engineering effort to design innovative power transfer technology.

Finite element analysis (FEA) images of a preliminary contact shaft design show how materials and geometries react to a simulated short circuit. FEA ensures efficient designs with reliable performance and added value to the customer.

integrates the switch and service disconnect

- First load shed optimization for power control systems
- First 10KA UL main bus rating for engine paralleling systems.

ASCO also pioneered the world's most advanced automatic transfer switch—the 7000 Series. The company developed the 7000 Series using a powerful array of human and technological resources.

Today, experienced engineers with decades of accomplishments and advanced degrees in design theory and analysis employ cutting-edge value engineering to design, test and qualify innovative transfer switch technology.

Technological tools such as 3-D computer-aided modeling facilitate the design process. Finite element

analysis helps engineering teams design components that manage magnetic and mechanical stresses dependably.

Teams evaluate prototypes with fused deposition modeling and a power lab that verifies the performance under real conditions and qualifies designs to listing agency standards. High-speed video photography enables engineers to analyze how designs react to stress over time frames spanning a few milliseconds.

The result is a continuing stream of innovations in power transfer technology that meets the evolving needs of healthcare facilities...and assures that ASCO remains the worldwide industry leader.

In terms of configuration flexibility, the 7000 Series Transfer Switch family is based on a four-pole architecture and a single or dual

solenoid. Also, one controller is utilized for all amperages, voltages, frequencies and transfer switch configurations (open transition, delayed transition and soft load).

Quality is assured with the ISO 9001:2000 certification that ASCO has earned for its production facilities.

ASCO Power Transfer Switches are easy to operate because information-rich, menu-driven and multi-language displays are intuitive, requiring no operating manuals.

One reason the switches are easy to service is that arcing and main contacts can be replaced from the front of the enclosure, without removing the power conductors.

Besides world-class transfer switches, healthcare engineering depart-

ments also want the security of a dependable company large enough to satisfy their evolving need for application support, project management and around-the-clock field service. Standing behind each 7000 Series Automatic Transfer Switch is ASCO, a company that manufactures, services, modifies and upgrades more transfer switches than any other company in the world.

ASCO continues to develop advanced power transfer solutions for demanding applications, so whatever the challenge, ASCO can help healthcare engineering departments keep their power on.

ASCO Power Technologies®

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