How to manage the risk of your healthcare facility’s infrastructure.

A comprehensive HealthBuildings Risk Assessment protects your facility’s critical systems.

Make the most of your energy℠
How healthy is your hospital?

The average US hospital building today is 27 years old.

Most hospitals were built over many years with different systems added and varying levels of maintenance performed. This has created complex healthcare facilities that risk instability because each system typically operates disparately yet is critical to the infrastructure.

Your hospital infrastructure has thousands of pieces of equipment and system parts, ranging from massive boilers, switchgear, and uninterruptible power supplies (UPS), to sensors that go virtually unnoticed. So how can you ensure your hospital building is safe and has the ability to offer uninterrupted care for the long term? At Schneider Electric™, we believe this:

Creating the safest hospital is as much about having full visibility into your building’s overall state as it is about actual resources to fix problems.

Mitigate risk and determine the most fiscally sound road map to full facility health.

A HealthBuildings Risk Assessment identifies potential issues before they affect your hospital while allowing you to prioritize your CapEx and OpEx spending.

Critical equipment failure brings unexpected costs and the possible loss of revenue-generating services. It can significantly impact patient care/satisfaction and employee safety, while increasing exposure to litigation and negative public relations. Environment of Care standards require hospitals to maintain their buildings and understand the health of their utility systems.

Today, the safest, most profitable hospitals are run by those who have their finger on the pulse of their buildings’ equipment and systems, identifying problems before they negatively affect their hospital. You can use our HealthBuildings Risk Assessment report to accomplish this.

This assessment provides a detailed, documented road map of the risks associated with your facility’s critical infrastructure including electrical, mechanical, security technology, and data center power and cooling systems. Our services are available for any manufacturer’s brand of equipment.

This report rates your buildings’ risks based on multiple impact levels such as the effect on patients and the probability of occurrence. It then provides suggestions on the best ways to mitigate these issues along with the estimated costs. You determine the next steps to correct deficiencies based on your organization’s criteria and timelines.

The result will be a safer, more profitable hospital. With this easy-to-use risk assessment, you can develop a schedule of priorities and create a performance improvement plan to optimize future capital and operational expenditures. You will more fully protect people and assets while prolonging the life of your healthcare facility.
A complete mechanical, electrical, security technology, and data center checkup.

From identifying and prioritizing unseen issues to solving and documenting them, this risk assessment empowers your decision-making.

**Step 1: Evaluate — assess risks**
- Review condition of equipment, identify code compliance issues, and update documentation
- Conduct engineering studies to determine defects, deficiencies, and document results in detail
- Define and prioritize issues based on impact to patient care and other critical facility operations
- Assess probability of occurrence for each issue identified and outline appropriate corrective measures including estimated costs useful for capital planning

**Step 2: Plan — determine course of action**
- Outline written policies for infrastructure to address standards
- Provide step-by-step procedures and schedule for all infrastructure maintenance and testing activities including planned shutdowns
- Highlight areas to improve physical environment

**Step 3: Execute — mitigate risks**
- Perform maintenance and testing services on the facilities’ infrastructure at intervals dictated by your request
- Turnkey major retrofit, replacement, or other upgrade projects

**Step 4: Measure — review the results and findings**
- Walk through and analyze operational issues reported by facility personnel
- Review programs implemented (e.g., Maintenance Plan, Emergency Action Plan) and applicable changes in regulatory requirements
- Develop recommendations for improvement

**Make your hospital safer by reducing vulnerabilities.**

Now choose solutions based on actual risks and optimizing your limited funds.

The HealthBuildings Risk Assessment provides a complete inventory of facility equipment in your electrical systems, data center infrastructure, mechanical systems, and security technology. You’ll learn the condition of your equipment and systems, considering age and past maintenance practices, and discover your facility’s ability to recover if an emergency occurs.

You will also more easily meet regulatory requirements of OSHA and NFPA 70E®, while more fully evaluating compliance with key sections of NEC®, NFPA 99, ASHRAE, and The Joint Commission requirements.

Within each of the four risk focus areas, you will receive the following benefits:

**Electrical:** Identify issues including the condition of equipment, code violations, outdated workplace safety requirements, and environmental conditions that could cause future equipment malfunction and compromise power system reliability. Establish priorities for corrective actions and/or improvements.

**Data Center:** Identify excessive load conditions, ineffective backup power, and single points of failure that can compromise uptime. Review cooling distribution to ensure standards are met and potential hot spots are avoided. Provide best practice recommendations in achieving high availability, managing capacity, and maximizing energy efficiency.

**Mechanical:** Identify risks and associated criticality in mechanical systems/building automation controls and generate risk mitigation strategies. Assess the condition of equipment in terms of age, maintenance practices, and the overall suitability of the application.

**Security:** Improve safety. Evaluate the current security infrastructure and networking environment utilizing life cycle analysis and manufacturer recommendations to determine critical deficiencies when compared against industry standards, new technology, and/or societal changes.

**Proven results**

- **15** Operational Excellence Awards
- **8** Perfect Record Awards
- **1** Superior Record Award

Awarded to Schneider Electric Services by the National Safety Council
Now spend less time managing hospital building issues.

With an easy-to-use risk assessment at your fingertips, you’ll make the case for infrastructure improvements.

The following is a portion of the simple-to-use HealthBuildings Risk Assessment table. This overview allows for quick identification of deficiencies, along with the level of risk that they pose according to potential impact to patient care. Detailed information aligned to the table will be provided about the equipment and systems. The report can be used to address immediate risks that may negatively affect the hospital. For the long term, use this report to plan for necessary infrastructure improvements and prioritize those investments.

<table>
<thead>
<tr>
<th>Findings</th>
<th>Location</th>
<th>Equipment</th>
<th>Deficiency</th>
<th>Picture</th>
<th>Action</th>
<th>Patient Impact</th>
<th>Safety Hazard</th>
<th>Probability</th>
<th>Response Capability</th>
<th>Risk-Hazard Grade</th>
<th>Estimated Cost</th>
<th>Hospital Services Impacted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central Plant</td>
<td></td>
<td></td>
<td>Fire/explosion in switchgear room will cause loss of power for days</td>
<td>17</td>
<td>Portable generator with temporary wiring to emergency loads</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>0.640</td>
<td>$40,000</td>
<td>X X X X X X</td>
</tr>
<tr>
<td>Patient Garage</td>
<td></td>
<td>Transf T2</td>
<td>Transf near end of life</td>
<td>49</td>
<td>Replace Transf before failure</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>0.480</td>
<td>$60,000</td>
<td>X X X X X X</td>
</tr>
<tr>
<td>Patient Garage</td>
<td></td>
<td>Video Surveillance</td>
<td>Lack of video surveillance</td>
<td>201</td>
<td>Installation of video surveillance at garage entrances, emergency call stations, and stairwells</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>0.480</td>
<td>$45,000</td>
<td>X X X X X X</td>
</tr>
<tr>
<td>IDF Closets</td>
<td></td>
<td>Access Control</td>
<td>No access control on any IDF closet</td>
<td>208</td>
<td>Installation of access control equipment on all IT infrastructure IDF closets throughout the facility</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>0.409</td>
<td>$35,000</td>
<td>X X X X X X</td>
</tr>
<tr>
<td>Penthouse</td>
<td></td>
<td>MTS1</td>
<td>High dirt level (potential failure)</td>
<td>6</td>
<td>Clean basements, switches, and inspect</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>0.384</td>
<td>$1,500</td>
<td>X X X X X X</td>
</tr>
<tr>
<td>Data Center</td>
<td>CRAC Units 1 - 4</td>
<td></td>
<td>Current units barely able to meet load conditions</td>
<td>104</td>
<td>Add 2 additional 20-ton down-flow units to provide redundancy</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>0.280</td>
<td>$50,000</td>
<td>X X X X X X</td>
</tr>
<tr>
<td>Data Center</td>
<td>UPS</td>
<td></td>
<td>Single point of failure that is loaded at 84% with battery life at 12 minutes</td>
<td>99</td>
<td>Add second 100 kW UPS with battery backup of at least 15 minutes</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>0.230</td>
<td>$60,000</td>
<td>X X X X X X</td>
</tr>
<tr>
<td>BAS</td>
<td>Through</td>
<td>Standard power – no backup</td>
<td>UPS on server, critical control panels</td>
<td>44</td>
<td>UPS on server, critical control panels</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>0.154</td>
<td>$50,000</td>
<td>X X X X X X</td>
</tr>
<tr>
<td>BAS – Server Room</td>
<td>BAS Server</td>
<td>No automated database backup</td>
<td>Configuration, initiate, and test automatic backup and restore routine</td>
<td>73</td>
<td>Configuration, initiate, and test automatic backup and restore routine</td>
<td>4</td>
<td>1</td>
<td>4</td>
<td>5</td>
<td>0.128</td>
<td>$10,000</td>
<td>X X X X X X</td>
</tr>
<tr>
<td>Mechanical Room</td>
<td>Room 6</td>
<td>AHU-16</td>
<td>Beyond serviceable life</td>
<td>22</td>
<td>Replace</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>0.077</td>
<td>$60,000</td>
<td>X X X X X X</td>
</tr>
<tr>
<td>Roof</td>
<td>AHU-22</td>
<td>VFD fault</td>
<td>Repair and recommission</td>
<td>157</td>
<td>Repair and recommission</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>0.038</td>
<td>$3,000</td>
<td>X X X X X X</td>
</tr>
<tr>
<td>Chiller Plant/ Chiller Room</td>
<td>Chiller Water System</td>
<td>No N+1 pump</td>
<td>Add CHW pump</td>
<td>96</td>
<td>Add CHW pump</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>0.029</td>
<td>$25,000</td>
<td>X X X X X X</td>
</tr>
</tbody>
</table>

How to read this chart

Risk to the hospital is expressed as the Risk Hazard Grade: the overall grade of the finding which is used to assign priority to the finding. The Risk Hazard Grade is determined by the combination of four equally weighted factors:

1. The impact of the occurrence to patient care
2. The safety hazard to electrical works
3. The probability of an occurrence
4. The ability to respond quickly to correct the negative effects of the occurrence

The Risk Hazard Grade is calculated on a scale of 0 – 1 with 1 having the most serious impact, and are color coded from least to most urgent as green, blue, yellow, orange, and red:

Risk Hazard Grades:
- 0 – 0.018
- 0.019 – 0.079
- 0.080 – 0.216
- 0.217 – 0.512
- 0.513 – 1.0

Sample representation of a Hazard Vulnerability Analysis for a hospital
## Electrical Systems

Disruptions or fluctuations in the electrical system can have life or death implications.

Help ensure safe, reliable, and continuous power.

### HealthPower Infrastructure Program

The electrical distribution equipment used in hospitals must offer the highest possible levels of reliability and safety yet have the flexibility to meet the rapidly changing needs of the healthcare industry. The HealthPower Infrastructure Program identifies and mitigates risk factors associated with the safety, operation, maintenance, and regulatory compliance of your electrical system.

Performed by professional engineers, our risk assessment service identifies and prioritizes issues, including environmental conditions that could cause future equipment failure and compromise power system reliability. These assessments are performed to reduce risk to your hospital from reliability issues, code violations, or outdated workplace safety requirements.

Our systematic approach ensures the entire electrical system is covered, from surgery suites to patient rooms to ancillary areas. The scope of work includes the entire power distribution system from the utility service to the last branch-circuit panelboard. Our services are available for any manufacturer’s brand of equipment.

### Equipment evaluated

- Automatic transfer switches
- Drives
- Generators
- Isolated power systems
- Main switchgear
- Meters
- Motor control centers
- Panelboards
- Paralleling switchgear
- Power conditioners
- Power factor correction equipment
- Three-phase switchboards
- Transformers

### Experience ready for you

10,000+

The number of power system assessments, designs, and analyses completed by our power system engineers.

100+

Number of Schneider Electric engineers collectively registered in every state in the U.S.

### A full electrical risk assessment from policies to equipment to best practices.

Fully understand the hidden dangers in your electrical system and improve your ability to meet requirements.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walk-through assessment</td>
<td>Visual inspection of equipment to acquire knowledge of equipment condition, produce documentation and photographs.</td>
</tr>
<tr>
<td>System one-line evaluation</td>
<td>Review system one-line drawings and the topology of power distribution to evaluate opportunities for improving system reliability.</td>
</tr>
<tr>
<td>Equipment condition evaluation</td>
<td>Assess the condition of the equipment as to age, maintenance practices, and the overall suitability of the application.</td>
</tr>
<tr>
<td>Codes compliance evaluation</td>
<td>Evaluate the power distribution system against a checklist of key issues related to the NEC, NFPA 99, and The Joint Commission requirements.</td>
</tr>
<tr>
<td>Electrical safe work practices (ESWP) policy review</td>
<td>Review the facility’s ESWP policy for compliance to OSHA and NFPA 70E requirements.</td>
</tr>
<tr>
<td>Environmental conditions evaluation</td>
<td>Evaluate the environmental condition of your electrical distribution components and its suitability to proper equipment operation.</td>
</tr>
<tr>
<td>Maintenance cycle review</td>
<td>Review the current maintenance cycle against industry best practices for healthcare facilities.</td>
</tr>
<tr>
<td>Emergency Action Plan (EAP) review</td>
<td>Review the electrical section of the facility’s EAP to ensure that emergency response actions are planned in the event of the breakdown of a key electrical component.</td>
</tr>
<tr>
<td>Arc flash analysis (optional service)</td>
<td>Estimate incident energy levels, identify appropriate levels of personal protective equipment (PPE), and determine flash protection boundaries at specific points in an electrical distribution system.</td>
</tr>
<tr>
<td>Time-current coordination analysis</td>
<td>Evaluate an electrical system’s protective devices, including relays, fuses, and circuit breakers, and the equipment to which they are applied.</td>
</tr>
<tr>
<td>Short circuit analysis (optional service)</td>
<td>Calculate the fault current levels throughout the power system. The interrupting duties of the devices being analyzed are compared with the available fault currents.</td>
</tr>
</tbody>
</table>
**Protecting a growing need: electronic data.**

Ensure current and future data center capacity while avoiding failure.

**HealthIT Infrastructure Program**

The importance of data has grown for hospitals with the advent of electronic medical records and the increasing use of digital control methods for equipment, building features, and security. The HealthIT Infrastructure Program analyzes your hospital’s current and future capacity requirements for data in terms of power and cooling infrastructure, capacity needs, and operations. It also highlights any single points of failure in the data center and recommends ways to mitigate the associated risks.

The factors taken into consideration while evaluating the infrastructure include: current and future data needs, IT load growth, uptime requirements, and historical concerns with existing equipment. The scope of this work is focused on the data center infrastructure comprising UPS, power distribution, cooling, static transfer switch, and backup generation. Also included is an evaluation of current management and control capabilities to schedule equipment and track assets.

**Equipment evaluated**
- Automatic transfer switches
- Backup generation
- Cooling distribution
- Controls and automation
- Electrical one-line
- Layout and operations
- Network closets
- Power distribution
- Uninterruptible power supplies

**Assess heating, cooling, and reliability in your data center.**

Gain solutions to improve energy efficiency, reliability, and availability.

**Risk Assessment: Data Center Infrastructure**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walk-through assessment</td>
<td>Visual inspection of data center equipment, checking for damaged equipment, improper installation, and environmental conditions.</td>
</tr>
<tr>
<td>Equipment condition evaluation</td>
<td>Assess the condition of the equipment with regard to age, and evaluate current maintenance practices against industry standards and manufacturer recommendations.</td>
</tr>
<tr>
<td>Power assessment</td>
<td>Check all major components of the power distribution infrastructure. Evaluate risk based on age, condition, environment, and current maintenance schedule. Record input and output load measurements taken from UPS.</td>
</tr>
<tr>
<td>Load analysis</td>
<td>Record, interpret, and analyze measured load data from power distribution units and discuss future IT needs.</td>
</tr>
<tr>
<td>Document static transfer switch configuration</td>
<td>Identify and record preferred and alternate power sources, document load readings, identify load balances and load transfer capabilities.</td>
</tr>
<tr>
<td>Cooling analysis</td>
<td>Visual assessment and inspection of equipment. Check environmental and equipment condition. Evaluate air distribution topology effectiveness relative to the computer room heat load. Measure airflow and temperature of the raised floor air distribution system. Identify possible obstructions and restrictions.</td>
</tr>
<tr>
<td>Backup generator analysis</td>
<td>Evaluate condition of backup generator including age, maintenance history, engine, fuel condition, and batteries.</td>
</tr>
<tr>
<td>Review the Emergency Response Policy and Contingency Plan</td>
<td>Evaluate current emergency response procedures within the data center and make recommendations to improve response time while prioritizing around the criticality of each system. Develop contingency plans to preserve data and quickly get the data center back online.</td>
</tr>
</tbody>
</table>
Identify risks in your mechanical systems to improve building systems reliability.

Identifying deficiencies in the backbone of your hospital’s mechanical infrastructure increases mechanical reliability and decreases risk of patient impact.

Patient satisfaction and comfort are extremely important in a hospital where heating and cooling can directly affect healing. You also need proper ventilation to lessen the spread of any germs. Four areas greatly impact your hospital’s ability to meet these challenges: utility plant and systems (heating, cooling, refrigeration), air handling units (AHUs), distribution systems, and building automation systems (BAS).

**Health/Mechanical Infrastructure Program**

The Health/Mechanical Infrastructure Program includes a tour of the facility, inspection of mechanical system drawings and documentation, physical inspection of HVAC mechanical equipment, inspection of maintenance records, review of the alarm logs, and an in-depth inspection of the BAS system and its current condition.

**Equipment evaluated**

- AHUs and associated components
- BAS systems/equipment controls
- Boiler and steam systems in central plant
- Chilled water systems in central plant
- Chillers in central plant
- Compressors (pneumatic controls only)
- Cooling towers and cooling water systems
- Hot water systems in central plant
- Refrigeration equipment (excluding specialized medical equipment)

**Review of**

- Fan coil units/other terminal units
- Fire and smoke dampers
- Unit heaters

**A mechanical risk assessment from drawings and documentation to equipment.**

Look backward with event logs and forward to risk mitigation strategies to increase reliability of your building mechanical systems.

<table>
<thead>
<tr>
<th>Risk Assessment: Mechanical System</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walk-through assessment</td>
<td>Physical inspection of equipment to identify potential deficiencies.</td>
</tr>
<tr>
<td>BAS design and operational</td>
<td>Determine the condition of BAS by reviewing alarm and event logs, power interruption routines, system trend data, maintenance procedures, and backup/restore protocols, including physical inspection and design review.</td>
</tr>
<tr>
<td>inspection</td>
<td></td>
</tr>
<tr>
<td>Equipment condition evaluation</td>
<td>Assess the condition of the equipment as to age, maintenance practices, and the overall suitability of the application.</td>
</tr>
<tr>
<td>Maintenance cycle</td>
<td>Review the current maintenance cycle against industry best practices for healthcare facilities.</td>
</tr>
<tr>
<td>Code and safety review (optional</td>
<td>Review the mechanical section of the facility’s Emergency Response Policy to ensure that emergency response actions are planned in case of a breakdown of a key mechanical component. Record observations related to code and safety as found during the inspection.</td>
</tr>
<tr>
<td>service)</td>
<td></td>
</tr>
</tbody>
</table>
A new look at hospital safety.

What works today, plus new technology to increase operational efficiency.

A safe and secure environment is a fundamental requirement for patients, visitors, staff, healthcare professionals, and assets in today’s healthcare marketplace. Because hospitals must be open and welcoming, there is need for increased awareness and attention to public safety and security initiatives.

HealthSecurity Infrastructure Program

The HealthSecurity Infrastructure Program establishes a baseline on how your security department utilizes its existing technology and operations to support the service levels required by your hospital. This information helps determine functional and performance requirements and the best possible utilization of existing technology and systems. Additionally, the assessment recommends new technology and solutions to increase operational efficiency.

Equipment evaluated

- Access control
- CCTV and video surveillance
- Communication center/EOC (layout and technologies, not operations)
- Duress and panic alarms
- Entrances
- Human-machine interface (HMI)
- ID badges
- Intercom and duress stations
- Intrusion alarms
- Nurse call
- Parking control
- RTLS and Wi-Fi® solutions
- Technology
- Visitor management
- Wireless clock systems

Assess security technology and plans.

Ensure that equipment supports operations in any event.

Risk Assessment: Security

<table>
<thead>
<tr>
<th>Activity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walk-through assessment</td>
<td>Visual inspection of equipment to acquire knowledge of equipment condition and produce documentation, photographs, etc.</td>
</tr>
<tr>
<td>Security and IT Department interviews</td>
<td>Interview the current key Security and Information Technology Department personnel responsible for the technologically driven security infrastructure.</td>
</tr>
<tr>
<td>Equipment condition evaluation</td>
<td>Assess the condition of the equipment as to age, maintenance practices, and the overall suitability of the application.</td>
</tr>
<tr>
<td>Maintenance cycle</td>
<td>Review the current maintenance cycle against industry best practices for healthcare facilities.</td>
</tr>
<tr>
<td>Review the Emergency Response Policy and Contingency Plan (optional service)</td>
<td>Review the security section of the facility’s Emergency Response Policy to ensure that emergency response actions are planned in case of a breakdown of a key security component. Please note this is a function of equipment uptime, not a review of risk management.</td>
</tr>
</tbody>
</table>

Why choose Schneider Electric Services?

As the global specialist in energy management, you can count on Schneider Electric Services to help manage the life cycle of your hospital building.

We will be there to support you now and in the years to come, from start-up/commissioning to training to preventative maintenance and testing to upgrade and modernization solutions.

With a nationwide team of professional engineers and qualified field service representatives, we are committed to providing you with innovative solutions, best-in-class customer service, advanced technical support, and exceptional quality!

- Our professional engineers are strategically located throughout the U.S. and collectively registered in every state
- Our field service representatives are qualified, as defined by OSHA and NFPA 70E
- Our culture of safety helps mitigate your risks
- Our North American Operating Division is the only company to simultaneously hold the Robert W. Campbell Award (2009) and the Green Cross Award (2011)
Extend your hospital infrastructure’s efficiency and life cycle.

Protect your facility’s critical infrastructure with a HealthBuildings Risk Assessment.

With a detailed, documented road map of your hospital’s critical infrastructure risks and solutions, you will have your finger on the pulse of your hospital facility and can make the best use of your limited CapEx and OpEx spending. You’ll meet Environment of Care standards while better protecting patient care, employee safety, and reducing possible exposure to litigation and negative public relations. We can’t wait to show you what our HealthBuildings Risk Assessment can do for your hospital! Contact us today.

Visit us at www.schneider-electric.com/us or contact your Schneider Electric representative today!

Leveraging the power of our global brands

Pelco™ by Schneider Electric is a world leader in the design, development, and manufacturing of video security systems ideal for any industry. APC™ by Schneider Electric ensures high availability and reliability in security technology as a pioneer in data center infrastructure. Square D™ by Schneider Electric is one of the most trusted names in electrical distribution, power, and control — from residential to industrial construction. These brands are integral parts of the Schneider Electric portfolio.