Schneider Electric is an authorized source for quality electrical products, services and energy conservation solutions.

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Energy and Power
Management Systems
Description

- PowerLogic® Energy and Power Management Systems help facility managers improve system reliability, better utilize equipment and manpower, and reduce energy costs.
- Emergency Power Supply System (EPSS) test reporting: Generators, automatic transfer switches and other emergency power supply system equipment can be monitored to capture testing data through automatic retrieval and reporting to expedite routine maintenance.

Benefits

- Highly accurate metering measures and stores real time energy data, power quality and event data necessary to manage energy consumption, minimize equipment damage and reduce power disruptions
- Analytical software provides an integrated approach to monitoring and managing energy use to identify inefficiencies, allocate costs, verify utility bills, reduce demand and much more
- Real-time visualization of entire power system to monitor power sources and breaker status
- Secure access to information through web browser from anywhere on the agency or facility intranet
- Measure min/max of electrical circuits to balance loads and utilize capacity
- Compare historical energy consumption patterns to actual power usage to detect discrepancies
- Measure and verify the success of energy conservation measures
- Allocate costs across multiple tenants in a facility or site

What to look for

- Facilities that have not met Section 103 (metering mandate) of EPAct 2005
- Facilities required to improve energy efficiency 3% per year (part of EPAct 2005 and Executive Order 13423)
- Facilities with existing metering and the need to expand energy and power management systems
- Customer needs to allocate and distribute costs to various tenants in the building or campus
- Customer is adding/upgrading automatic transfer switches or generator
- Customer expresses problems with overloads, voltage sags and/or utility bill discrepancies

Who to talk to

- Facility managers, directors or engineers
- Energy and utility managers and directors
- Electricians and maintenance personnel
- Electrical safety managers
Questions to ask

1. Are you responsible for compliance with the energy efficiency and metering mandates of EPAct 2005? If not, who is?
2. What steps have you taken so far to meet the mandates?
3. Do you have a system to collect and manage data from your meters?
4. Do you receive complaints about the following:
   - Power quality?
   - Outages?
   - Nuisance tripping?
   - Overheating?
   - Limited capacity?
5. Do you have multiple tenants at your facility and need to allocate consumption to these tenants by cost centers?
6. Have you had any unexplained equipment failures? Do you think it might be related to transients or voltage sags?
7. Would you like to have a Square D representative contact you to discuss solutions to better manage your energy and power?
Things to know

- Federal buildings are striving to achieve compliance with the annual energy reduction goal of 3% per year through 2015 (total of 30% reduction vs. 2003 consumption).
- By October 1, 2012, all federal buildings must use advanced meters to measure and monitor electricity use.
- All agencies must procure ENERGY STAR® or FEMP designated products when available and cost effective.
- Older facilities are expanding and upgrading their existing power systems and infrastructure.
- All new buildings must be designed for a 30% reduction to ASHRAE 90.1 standards.
- Federal facilities must measure and verify savings from Energy Saving Performance Contracts (ESPC).
- Square D® has the largest installed base of power monitoring and control systems in the industry.
- A tightly integrated network of software and meters can span a single facility or an entire multi-site enterprise.
- PowerLogic systems monitor key points and equipment, 24 hours a day, from generators and substations to service entrances, mains, feeders and loads; delivering timely, relevant information to anyone that needs it, anywhere they are.
- Advanced analytic tools enable effective decisions, while coordinated control capabilities help act on them. Together, this represents fast and quantifiable return on investment, often within a few months.
- Schneider Electric can design, integrate, install and commission a system for optimal performance as well as provide on site training.
- Square D® Power System Automatic Controls are a total solution approach that includes control design, programmable controller logic and supervisory software functions tailored to provide user interaction, digital alarming for extremely fast response and graphical animation. Examples include automatic throwover schemes, load shedding schemes, load preservation and breaker sequencing schemes to
For more information call 866.233.2394

manage demand penalties.

Description

- Square D® Clipsal® and Powerlink® lighting control systems provide comprehensive lighting control solutions for today’s commercial buildings.
- Lighting controls reduce energy consumption and demand while also helping customers meet the energy efficiency mandates of EPAct 2005 and Executive order 13423.
- Lighting controls are required by most new building energy codes (such as ASHRAE 90.1-2004) and are a required prerequisite for achieving any LEED® certification.

Benefits

- Energy consumption can typically be reduced by 25% or more by automatically shutting-off lights when rooms are not occupied
- Lighting control can also be effectively used to reduce electrical demand by shedding non-critical lighting loads (effective load reductions in excess of 15% are often readily achieved)
- Square D lighting controls integrate easily with other facility operations, such as HVAC, security and fire, so customers can monitor and control each building function with a single system
- Access to Square D lighting control from any computer with a web browser allows for optimum control throughout the building
- Distinctive keypads, touchscreens and remotes provide occupants with intuitive means for individually controlling their lights

What to look for

- Customer has many of their lights on in buildings when they are not occupied
- Safety requirements prohibit occupants from switching breakers in panelboards to switch lights (no wall switches to control lights)
- Customer has many old fixtures that will need to be replaced (ideal to incorporate controls with lighting retrofits)
- Customer has many windows in entryways, hallways, offices and/or meeting rooms that could provide daylighting

Who to talk to

- Facilities managers, directors and engineers
- Energy and utilities managers and directors
- Electricians and maintenance personnel
- Procurement officers
Questions to ask

1. Are you responsible for compliance with energy efficiency and metering mandates of EPAct 2005? If not, who is?
2. What steps have you taken so far to meet the mandates?
3. Are you trying to meet ASHRAE requirements or gain LEED certification?
4. Are lighting controls currently being used?
5. Are you familiar with lighting controls and their potential energy savings?
6. Are you looking to reduce demand cost, shed loads or participate in an automated demand response program?
7. Are you concerned with ease of installation, minimal downtime/disruption of work?
8. Do you wish to integrate lighting control into an existing building automation system?
9. Are aesthetics of keypads and touch screens important?
10. Are you looking for lighting control for a single room, building or entire campus, including walkways and parking areas?
11. Are you looking at attaining a LEED certification?
Things to know

- Whether a customer needs an entire campus wide networked system or a single conference room with multiple lighting scenes and shade control – Square D has a solution.
- Square D can provide design, installation, commissioning and life cycle support.
- Options available include:

  **Schedule based control:** PowerLink lighting control panelboards
  - Four different systems are offered and can be custom tailored for specific applications based on the level of networking desired
  - Square D teamed up with other controls manufacturers to ensure full compatibility and communication between systems – typical building system interfaces that are compatible: Allen Bradley, Danfoss, Honeywell, Johnson Controls, Novar, Modicon, Siemens, Trane, TAC and many more
  - PowerLink lighting control systems are housed in the lighting panelboard. No extra boxes to mount. No relays to wire. No complex panel schedules to decipher. Installation takes no more time than mounting a standard lighting panelboard. A small footprint eliminates the need to work around space constraints
  - Transparent Ready® Systems allow you to monitor operations and make configuration changes from virtually anywhere using a standard web browser so there’s no need for expensive client based software
  - Customizable web pages allow users to pick and choose only the information they need to see
  - Lighting zones can be overridden easily during normally “off” scheduled periods
  - Lighting periods extended easily for extra “shift” time
  - “Global” scheduling minimizes complexity by eliminating the need to reprogram individual panels
  - Convenient access to schedules for holidays and one-time events

  **Occupancy Based Controls:** Passive Infrared (PIR), Ultrasonic (US), Dual Technology (DT)
  - Wall switches are easy to install for private offices, conference rooms, break rooms and private restrooms (PIR technology)
  - Ceiling sensors provide effective coverage for private offices, utility closets, warehouses and hallways where major motion detection is important (PIR, US and DT)

  **Daylighting and Dimming Controls:** (keypads, touch screens and dimmers)
  - Clipsal products bring a sophisticated, contemporary look to work environments
  - With its unique C-Bus™ network, Clipsal products can connect directly to a network using a Cat 5 cable, reducing the cost of running conduits and wire typically associated with traditional control systems
  - Available types of dimmers include: DIN rail mounted for incandescent and low voltage lamps, Pro Dimmers for higher power requirements, fluorescent lamp dimmers, DALI ballast compatibility
  - Relays are also available to provide flexible control over individual spaces
Variable Speed Drives
Description

- Variable speed drives are used to reduce speed of electric motors.
- Starters and contactors operate motors at full speed.
- Variable speed drives are used as electronic controls to adjust the speed of electric motors. By decreasing the motor speed, drives can reduce electrical energy usage and control building comfort.

Benefits

- Variable speed drives save money
- Increase comfort in buildings
- Reduce equipment maintenance costs and downtime

What to look for

- Is the customer currently using variable speed drives to operate pump and fan motors with their HVAC equipment? HVAC equipment includes air handling units, supply and return air fans, cooling tower pumps and fans, boiler and chiller pumps to heat and cool the building
- Is the customer considering in kind or like for like replacement of electro-mechanical starters?

Who to talk to

- Facility managers, directors or engineers
- Energy and utilities managers and directors
- Electricians and maintenance personnel
- Electrical safety managers
- Procurement officers
Questions to ask

1. Are drives currently being used with pump and fan motors?
2. Are you considering replacing electromechanical starters?
3. Are you familiar with Square D electrical products? Emphasize that Square D enclosed drives are designed for thermal management inside the enclosure. Drives generate heat internally. How the drive enclosure dissipates heat build-up is important to the life of the electronics in the drive.
4. What is the building voltage level (208, 230 or 460 volt)?
5. What is the horsepower rating of the motors intended to be used with the drive (1-500 horsepower)?
6. What is the full load amperage (FLA) of the motors intended to be used with the drive?
7. Do you have a building automation network system that you would like to communicate with (LonWorks®, BACnet, Metasys® N2, Apogee® P1, Modbus®, Ethernet TCP/IP)?
8. Would you like the ability to operate the motor at full voltage and bypass the drive entirely?
9. Where do you intend to mount the drive? Is there enough wall space to the mount the drive inside an existing mechanical room next to the equipment (Type 1 indoor or Type 12 indoor enclosures)?
10. Do you need to mount the drive on the roof or outside near a cooling tower and require an outdoor enclosure (Type 3R outdoor enclosure)?
Things to know

- Variable speed drives are a great way to increase energy savings. They pay for themselves in a relatively short period of time, typically less than two years through savings on electrical bills.
- Variable speed drives provide a soft start for motors eliminating full voltage peak inrush conditions, resulting in HVAC equipment and systems that:
  - Last longer
  - Reduce mechanical stress
  - Require less maintenance
  - Cause fewer instances of unscheduled equipment downtime
  - Lower inrush current and peak power demand
- Provide network connectivity with the building automation system, which allows for real time control to increase comfort inside the building.
- Installation of variable speed drives can increase bottom line net profit through utility and state and local government energy efficiency tax incentives and rebates.
- Enclosed variable speed drives are offered in four product families:
  - **S-Flex™ enclosed drives**
    - Offer Square D quality at a cost-effective price
    - Are a basic variable torque drive for HVAC pump and fan applications
    - Available in 1-40 horsepower at 208 volt and 230 volt, 1-100 horsepower at 460 volt and is stocked and ready for delivery within 5-10 working days
    - Offer communications capability with building management system standards such as BACnet, LonWorks, Apogee P1, Metasys N2, and Modbus
  - **E-Flex enclosed drives**
    - Are a full-featured enclosed drive offering with many options
    - Offer more options than the S-Flex
    - Are available from 1-50 horsepower at 208 volt and 240 volt and 1-100 horsepower at 460 volt
    - Offer communications capability with building management system standards such as BACnet, LonWorks, Apogee P1, Metasys N2, Modbus and Ethernet TCP/IP
    - Made to order because of its available options, and leadtime is 10-15 working days
  - **M-Flex enclosed drives**
    - Are a heavy duty, industrial-rated drive for variable and constant torque applications
    - Has higher horsepower ratings, up to 500 horsepower at 460 volt and is available in barriered bypass for increased safety
    - Engineered to order because of options (leadtime is 4-8 weeks)
  - **PowerGard™ 18 pulse drives**
    - Range up to 500 horsepower at 460 volt and are for applications where line current distortion should be kept at a minimum for sensitive electronic equipment
    - Engineered to order item because of options and configurations (leadtime is 10-12 weeks)
Arc Flash Studies for NFPA 70E® Compliance

Description

- Square D Services have professional engineers who can perform arc flash analysis to define equipment-specific arc flash energy levels. These levels determine the required PPE when personnel are exposed to live parts.
- Our results and recommendations will be aligned with the 2008 edition of NFPA.

Benefits

- Equipment specific labels indicating flash hazard boundaries and required PPE
- Short circuit and device coordination with arc flash analysis
- Update or develop single line diagrams
- Arc flash training for workers required by NFPA 70E and OSHA
- Insulated voltage rated tool requirements

What to look for

- Is the customer’s safety personnel or facility managers and directors working on becoming compliant with NFPA?
- Keep your ears open for customers inquiring about arc flash analysis or training
- If their short circuit and coordination study is old, then they are due to update and should include arc flash analysis
- Have they had issues with breakers not operating? Maintenance may be required per NFPA 70B.
- Has the utility upgraded their system over the years?
- Is the customer interested in updating their safety program and adding AF training?

Who to talk to

- Facility managers, directors or engineers
- Energy and utilities managers and directors
- Electricians and maintenance personnel
- Facility safety managers and directors (electrical safety)
Questions to ask

1. Are you familiar with NFPA 70E requirements?
2. Does your facility meet these requirements?
3. Have you had any recent electrical accidents where OSHA or agency safety leaders visited the site to investigate?
4. Were fines levied due to noncompliance with NFPA 70E?
5. Have you had other facilities that had an incident?
6. Are you proactively working to become compliant with NFPA 70E requirements?
7. Is the safety manager involved in meeting these requirements? Who are the contacts?
8. Has someone within your organization attended an awareness seminar on the compliance issues? If not, are you interested in having Square D Services perform a one-hour session?
9. Does your facility or agency have any deadlines imposed for compliance?
10. When is the last time the facility had their short circuit and coordination study updated? Is there a copy of this document?
11. Are the single line diagrams up-to-date? If not, could these be modified with penciled changes/additions?
12. Have there been any major facility expansions or reductions since the last study was performed?
13. Do you have any nuisance tripping on circuits?
14. Have there been instances where a breaker did not operate to clear a fault?
Things to know

- The NFPA 70E standard is not a federal regulation. However, OSHA may issue citations or levy a fine for non-compliance with NFPA 70E. The cost of becoming compliant is ultimately much less expensive than the OSHA fine.

- Short circuit studies identify potential hazards related to undersized electrical equipment for withstand current ratings versus available fault current within the system.

- Coordination studies will determine the optimal breaker/fuse/relay/overload ratings for the protective device against the respective damage curves of critical electrical distribution system components. These curves are plotted with recommended setting changes.

- Arc flash analysis studies will provide critical system evaluations to determine available incident energy levels; the flash hazard boundary along with the personal protective equipment requirements. Often equipment changes/additions shall be recommended to lower incident energy levels.

- Incident energy levels are dependent on protective settings of equipment and clearing time is a key factor in reducing potential incident energy levels.

- Data collection is a critical component of performing the scope of work. If the customer has a previous arc flash study this can be utilized for much of the system data. If not, Square D Services can offer this service.

- Square D Services can provide a sample specification document, which allow the customer to begin to develop a RFQ. Often a copy of the customers single line diagram can get the process started. Ask if you can have a copy to provide a quotation.

- Square D Services can provide a sample arc flash analysis report for a customer to review.

- Square D can provide engineered solutions to meet NFPA standards for arc flash compliance.

- Our personnel are trained to perform work at a customer site.

- Offer to return to the customer site with a Square D Services salesperson to begin mapping out a plan to become compliant.

- The arc flash study can lead to additional work at the customer site which could include:
  - Preventive maintenance
  - Training services
  - Equipment upgrades/modernization
  - New equipment opportunities
  - Additional system studies (i.e., power factor correction, power quality, load flow, etc.)
LV Replacement Circuit Breakers

Description

- Square D Services can modernize and extend the life of existing switchgear by replacing old low voltage circuit breakers with custom-engineered, low voltage Masterpact® circuit breakers.
- Retrofit: 12-14 hour outage, new bus extensions, mount new cradle and circuit breaker assembly, new door.
- Direct replacement: 15-30 minutes swap out of feeder breakers, new door.
- Candidate breakers or fused switches are major manufacturers’ obsolete equipment including Allis-Chalmers, Federal Pacific, GE, ITE/ABB and Westinghouse.

Benefits

- Significant installation savings and less downtime than replacing switchgear; modern breaker technology; new trip units; new circuit breakers can limit arc flash levels
- New trip units with advanced metering can help meet the EPAct 2005 Section 103 metering mandate.
- Improved safety features with the upgraded installation
- Reduced maintenance/operating costs with improved reliability

What to look for

- Older equipment (i.e., 25-40+ years) with draw-out or fixed-mounted circuit breakers
- Customer is considering replacement of older switchgear
- Customer is having problems with their breakers
- Customer has not performed maintenance consistently per manufacturer recommendations
- Customer has many spare breakers of different manufacturers
- Customer is concerned about safety of equipment operation

Who to talk to

- Facility managers, directors or engineers
- Energy and utilities managers and directors
- Electricians and maintenance personnel
- Electrical safety managers
- Procurement officers
Questions to ask

1. How old are your substations or switchgear lineups? Do you have plans to upgrade with new switchgear? Are there budget constraints? Are there outage issues?

2. Do you have any nuisance tripping on circuits?

3. Have there been instances where a breaker did not operate to clear a fault?

4. Do you have maintenance performed on these breakers routinely? If so, what frequency (i.e., how many years between servicing)?

5. What work is performed – inspect, clean and electrically test?

6. Have these breakers been upgraded with solid state trip units? If so, when?

7. Has the switchgear structure been affected by rust or other environmental conditions?

8. Do you have a power monitoring system in place?

9. Do you presently have ground fault detection? Do you have ground fault protection?

10. Do your feeder breakers have instantaneous settings?

11. Does the plant maintain many spares of various types within the plant?

12. Are spare parts or replacement circuit breakers available from the original equipment manufacturer?

13. Are you concerned about safety issues related to NFPA 70E?

14. Is the budget for performing facility maintenance decreasing?
Things to know

- In cases where there are high incident energy levels, the Masterpact® L1F Circuit Breaker could be utilized to improve clearing times.
- NFPA 70E assumes equipment to be in proper working condition (i.e., properly maintained).
- Square D Services can provide a sample specification document to allow the customer to begin to develop a request for a quote.
- The Masterpact circuit breaker upgrades enhance safety with a shutter mechanism within the cell; a new door with through-door racking; through-door trip unit display.
- Masterpact replacements can be used to modernize and replace bolted pressure switches, lowering the potential hazard for an arc flash incident.
- For high incident energy levels, the Masterpact L1F circuit breaker can improve clearing times.
- Ground fault protection can be added to meet current code requirements where applicable.
- Communications via the PowerLogic system can provide monitoring for improved energy management or proper cost allocation, and can help facilities and agencies comply with the EPAct 2005.
- Masterpact Circuit Breakers offer reduced maintenance requirements due to the state-of-the-art resin case, insulated and isolated poles and enclosed case.
- Circuit breakers will become interchangeable between gear (i.e., GE and FPE and/or new Power-Zone 4 Switchgear). Reduction of inventory and spares!
- Costs to upgrade can be 60-70% the cost of replacement with less downtime. Feeder cables are not disturbed.
- Equipment upgrades requires an initial brief outage for dimensional verification and scope review prior to manufacturing.
- Offer to return with a Square D Services salesperson to begin mapping out a plan to upgrade the equipment.
- The Masterpact Circuit Breaker upgrades can lead to additional work at the customer site which could include:
  - Preventive maintenance on associated equipment
  - Training services for operations/maintenance procedures
  - Equipment upgrades/modernization for other equipment (i.e., MV, relays, etc.)
  - New equipment opportunities standardized on Masterpact Circuit Breakers
  - Additional system studies (i.e., power factor correction, power quality, load flow, etc.)
- Upcoming changes in 2008 to NFPA 70E will explicitly require proper commissioning of electrical equipment to establish performance baselines, and routine scheduled maintenance to keep equipment in proper working condition.
- Square D Services can supply the recommended maintenance on any electrical equipment to ensure compliance with NFPA 70E and 70B, and provide training on proper maintenance procedures for on-site personnel.
Power System Studies

Description

- Square D Services professional engineers can perform a variety of power system studies to ensure the system reliability and safe operation of the electrical distribution system.

Benefits

- Identify overdutied equipment to prevent catastrophic failures
- Device evaluation and proper coordination for protective devices – people safety and equipment safety!
- Update or develop single line diagrams – know how power is distributed within the facility
- Identify cost savings

What to look for

- Customer knows that their short circuit and coordination studies are old and that they are due to update
- Customer has had issues with breakers not operating to clear a fault
- Utility upgraded their system over the years
- Customer is interested in adding on-site back-up power sources
- Customer has poor power factor and is being penalized
- Customer has fuses failing, capacitors failing, etc.

Who to talk to

- Facility managers, directors or engineers
- Energy and utilities managers and directors
- Electricians and maintenance personnel
- Electrical safety managers
- Procurement officers
Questions to ask

1. When is the last time the facility has had their short circuit and coordination study updated? Is there a copy of this document?

2. Are the single line diagrams up-to-date? If not, could these be modified with penciled changes/additions?

3. Have there been any major facility expansions or reductions since the last study was performed?

4. Do you have any nuisance tripping on circuits?

5. Have there been instances where a breaker did not operate to clear a fault?

6. Have you had any recent electrical accidents where OSHA or agency safety leaders visited the site to investigate? Was a failure mode investigation performed?

7. Are you proactively working to become compliant with NFPA 70E requirements?

8. Have you ever had an electrical system assessment performed to inspect for code compliance; proper grounding; ATS installation verification; maintenance frequency?

9. Do you have any unusual power issues that are causing problems (i.e., high neutral currents, light flicker, fuses failing, transformers failing, etc.)

10. Do you receive a penalty from the utility for poor power factor?
Things to know

- Short circuit studies identify potential hazards related to undersized electrical equipment for withstand current ratings versus available fault current within the system. The system can be modeled for various operating scenarios.

- Coordination studies will determine the optimal breaker/fuse/relay/overload ratings for the protective device against the respective damage curves of critical EDS components. These curves are plotted with recommended setting changes.

- Arc flash analysis studies will provide critical system evaluations to determine available incident energy levels; the flash hazard boundary along with the personal protective equipment requirements.

- Review of utility bills can help determine whether capacitor installations can save the customer money. Capacitor additions can also free up system capacity.

- Load flow studies should be performed if the customer is either expanding or downsizing.

- Power quality and/or harmonic analysis can uncover problems that go beyond the standard short circuit and coordination study, and the base requirement for any additional system analysis. An in-depth analysis of the system can determine causes of unusual situations and Square D Engineering Services can offer recommendations.

- Square D Services can provide a sample specification document to allow the customer to begin to develop a request for a quote.

- Often a copy of the customer's single line can get the process started – ask if you can have a copy to provide a quote.

- Offer to return to the customer site with a Square D Services salesperson to begin mapping out a plan to determine which studies are required.

- The system study can lead to additional work at the customer site, which could include:
  - Preventive maintenance
  - Training services
  - Equipment upgrades/modernization
  - New equipment opportunities
  - Additional system studies (i.e., power factor correction, power quality, load flow, etc.)