Critical Facilities Applications Using Transfer Switches

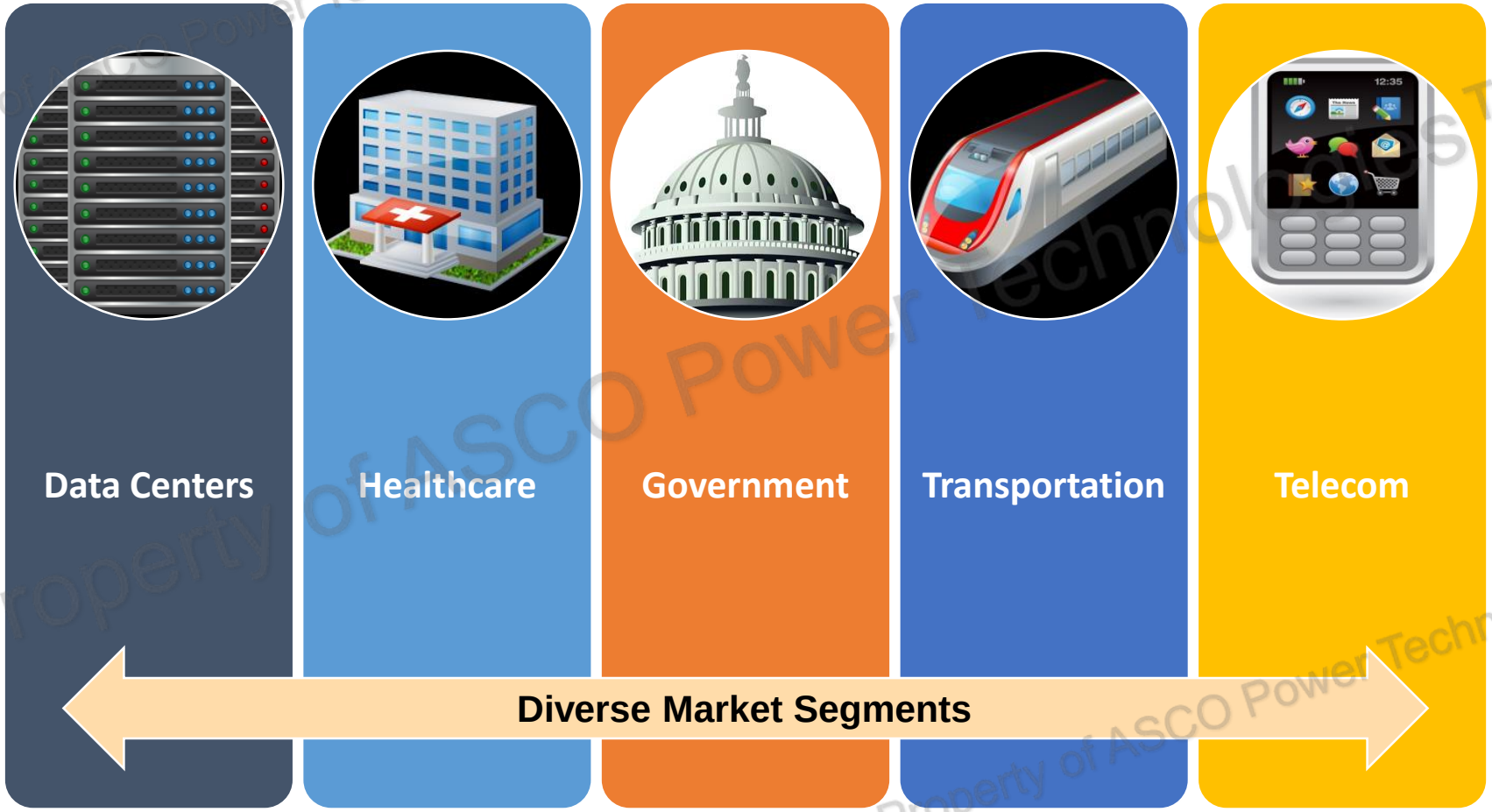
ASCO Power Technologies™

Presented by: Muzaffar Zaman – Midwest Area Sales Manager

Critical Power Product Overview Road Map

- **Critical Power Market Segments/Applications**
- 7000 SERIES Product Features
- 7000 SERIES Product Platforms
- Critical Power ATS Controller
- Withstand And Close On Ratings
- 7000 SERIES Optional Accessories
- Custom-Engineered Transfer Switches
- Review

Critical Power Market Segments /Applications



Critical Power Market Segments – ASCO Offerings

1. Automatic Transfer Switch
2. Power Control System
3. Load Bank
4. EcoStruxure Power (Critical Power Management Appliance)
5. Critical Power Services

ASCO Products Portfolio For Critical Facilities

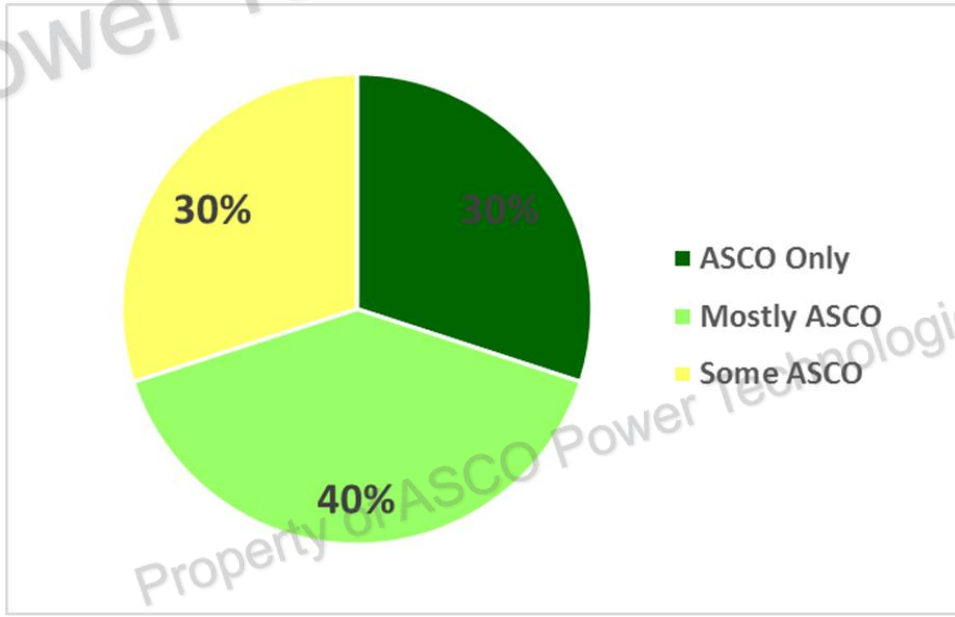
Critical Power Market Segments - Healthcare

BEST HOSPITALS U.S.News & WORLD REPORT RANKINGS

The Top US Hospitals Choose ASCO

100% Of Top Hospitals Have At Least Some ASCO
70% Of Top Hospitals Are Mostly or All ASCO
30% Of Top Hospitals Have Only ASCO

Rank	The 2018-2019 Honor Roll
1	Mayo Clinic (Rochester, MN)
2	Cleveland Clinic (Cleveland, OH)
3	Johns Hopkins Hospital (Baltimore, MD)
4	Massachusetts General Hospital (Boston, MA)
5	Michigan Medicine (Ann Arbor, MI)
6	UCSF Medical Center (San Francisco, CA)
7	UCLA Medical Center (Los Angeles, CA)
8	Cedars-Sinai Medical Center (Los Angeles, CA)
9	Stanford Health Care-Stanford Hospital (Stanford, CA)
10	New York-Presbyterian Hospital (New York, NY)
11	Barnes-Jewish Hospital (St. Louis, MO)
12	Mayo Clinic Hospital (Phoenix, AZ)
13	Northwestern Memorial Hospital (Chicago, IL)
14	Penn Presybterian Medical Center (Philadelphia, PA)
15	NYU Langone Hospital (New York, NY)
16	UPMC Presbyterian Shadyside (Pittsburgh, PA)
17	Vanderbilt University Medical Center (Nashville, TN)
18	The Mount Sinai Hospital (New York, NY)
19	Duke University Hospital (Durham, NC)
20	Brigham and Women's Hospital (Boston, MA)



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7000 SERIES Product Features

Conventional Two Position Transfer Configuration, Plus Closed And Delayed Transition. Also Available In Bypass Isolation And Service Entrance (SEATS) Configurations

- Automatic And Non – Automatic Open Transition Transfer Switches (7ATS,7MTS, & 7NTS)
- Closed Transition Transfer Switches (7ACTS, & 7NCTS)
- Delayed Transition Transfer Switches (7ADTS, & 7NDTS)
- Bypass Isolation Transfer Switches (7ATB, 7ACTB, & 7ADTB)
- Service Entrance Transfer Switches (SEATS) (7AUS, 7AUB,7ACUS,7ACUB,7ADUS, & 7ADUB)

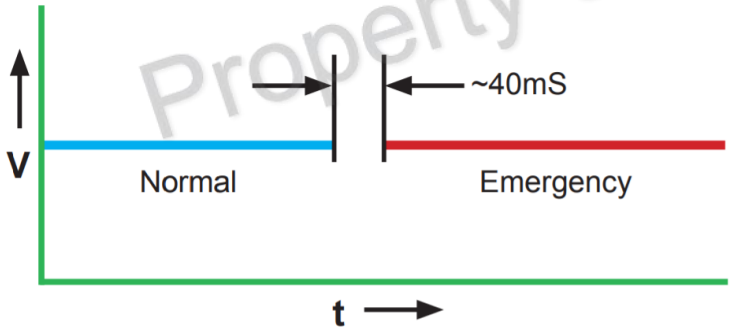


Figure 2: Open Transition Transfer

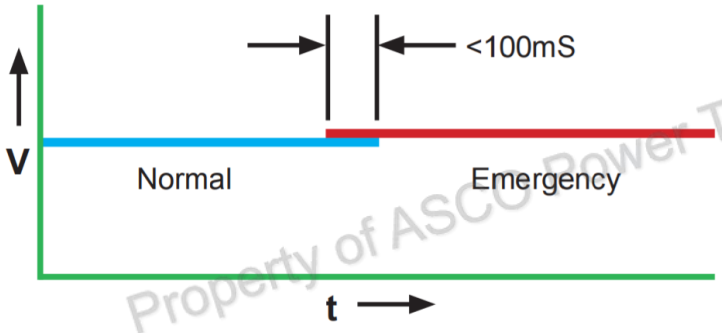
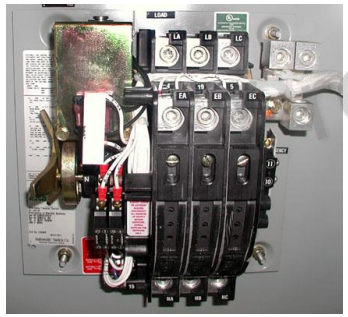


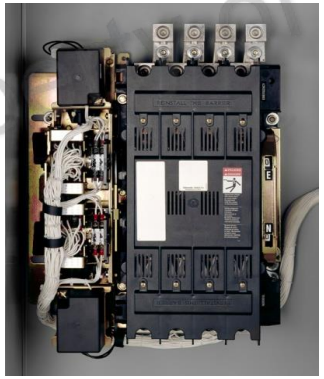
Figure 3: Closed Transition Transfer

7000 SERIES Product Features

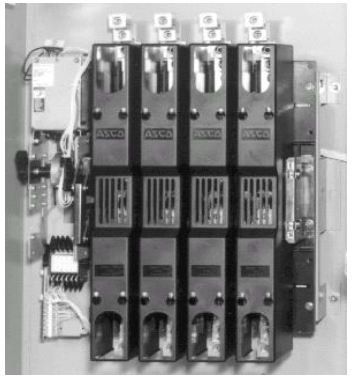
- UL Listed To 1008 Transfer Switch Equipment
- SEATS Also Listed To UL 891 (Switchboard Construction) For 250 – 4000 Amps
- CSA Certified To CSA 22.2 No 178 - 1978
- 2, 3, 4, (Switched Or Overlap Neutral) Pole Configurations
- Voltages to 600 V
- Group 5 Controller
- High Withstand And Close On Ratings Including New Short Time Ratings
- Optional Type 3R, 3RX, 4, 12, 4X Enclosures (Non – Secure And Secure)



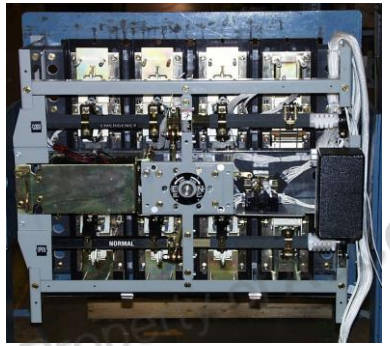
D Frame
30 – 230A



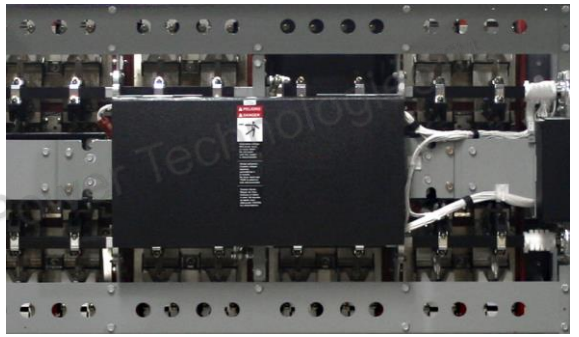
J Frame
150 – 600A



H Frame
600 – 1200A



G Frame
1600 – 3000A



G Frame 4000A

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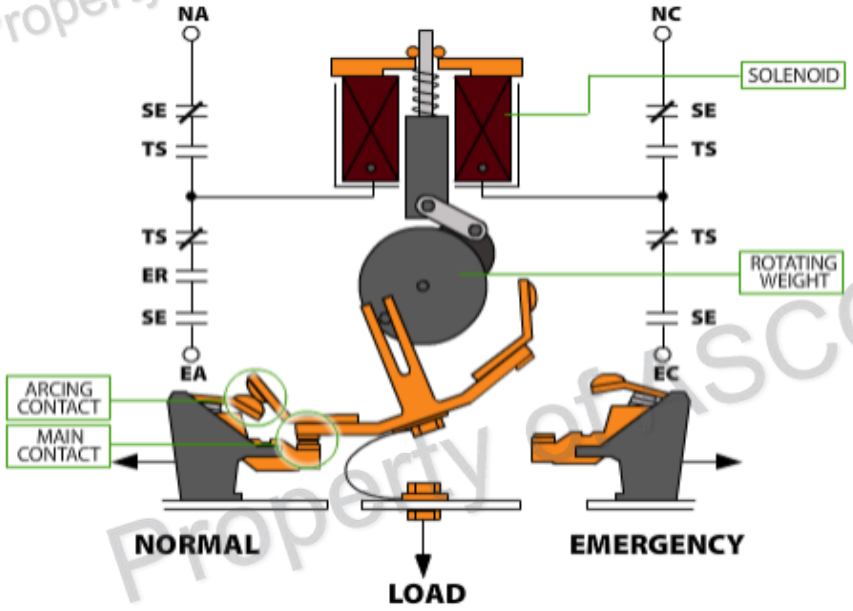
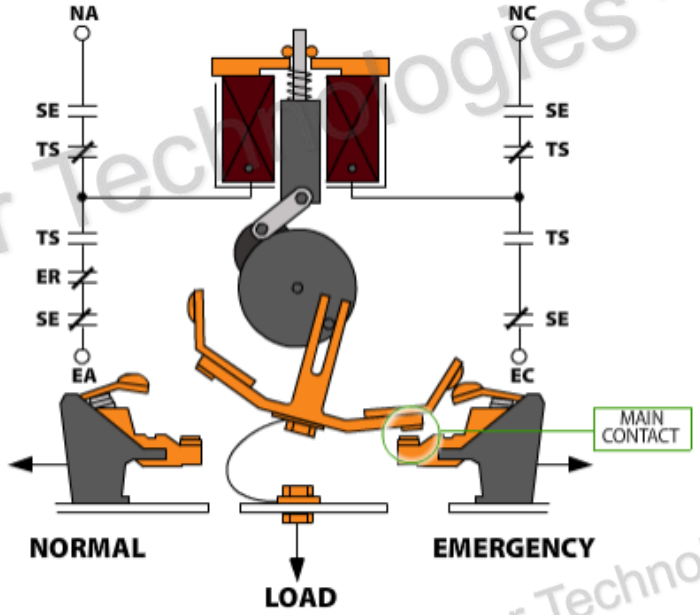
7000 SERIES Transfer Switch Product Platform

Electrically Operated



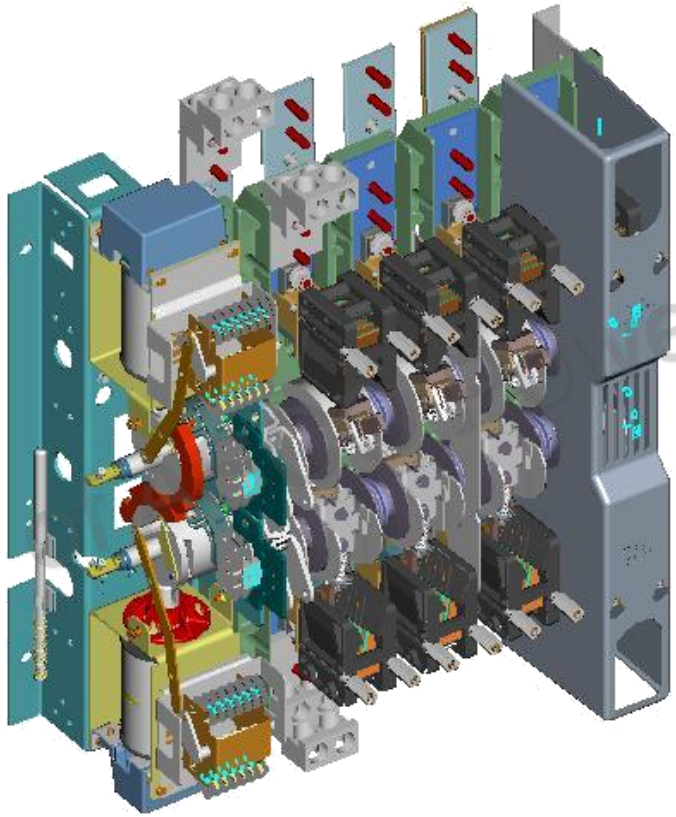
Mechanically Held



Fast **Simple** **Reliable** **Repeatable**

7000 SERIES Transfer Switch Product Platform

Dual Solenoid Assembly



Allows Dual Contactors to Operate Independently enabling:

- **Delayed Transition**
- **Load Shed to a Center Off Position**
- **Closed Transition (Limited Parallel)**
- **Soft Load (Extended Parallel)**

7000 SERIES Open Transition Transfer Switch 7ATS

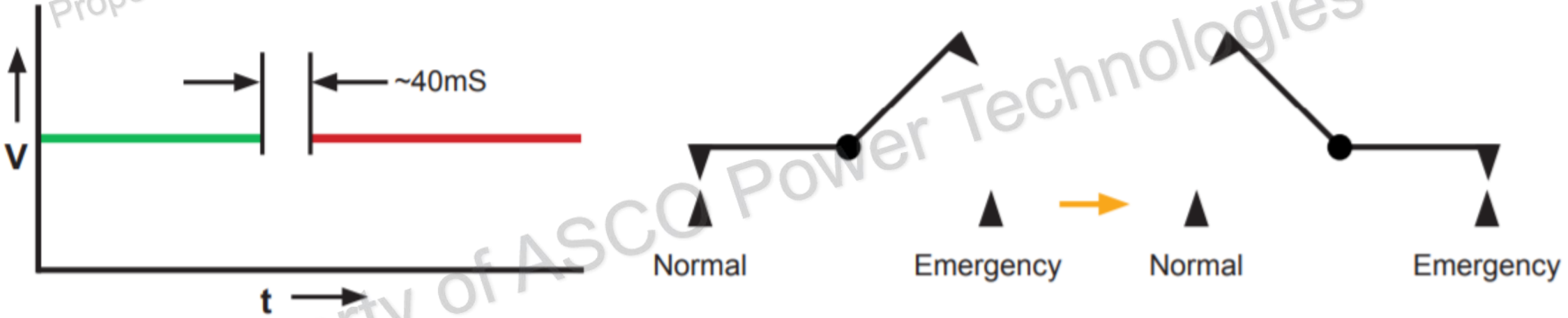


Figure 4: Open Transition Sequence

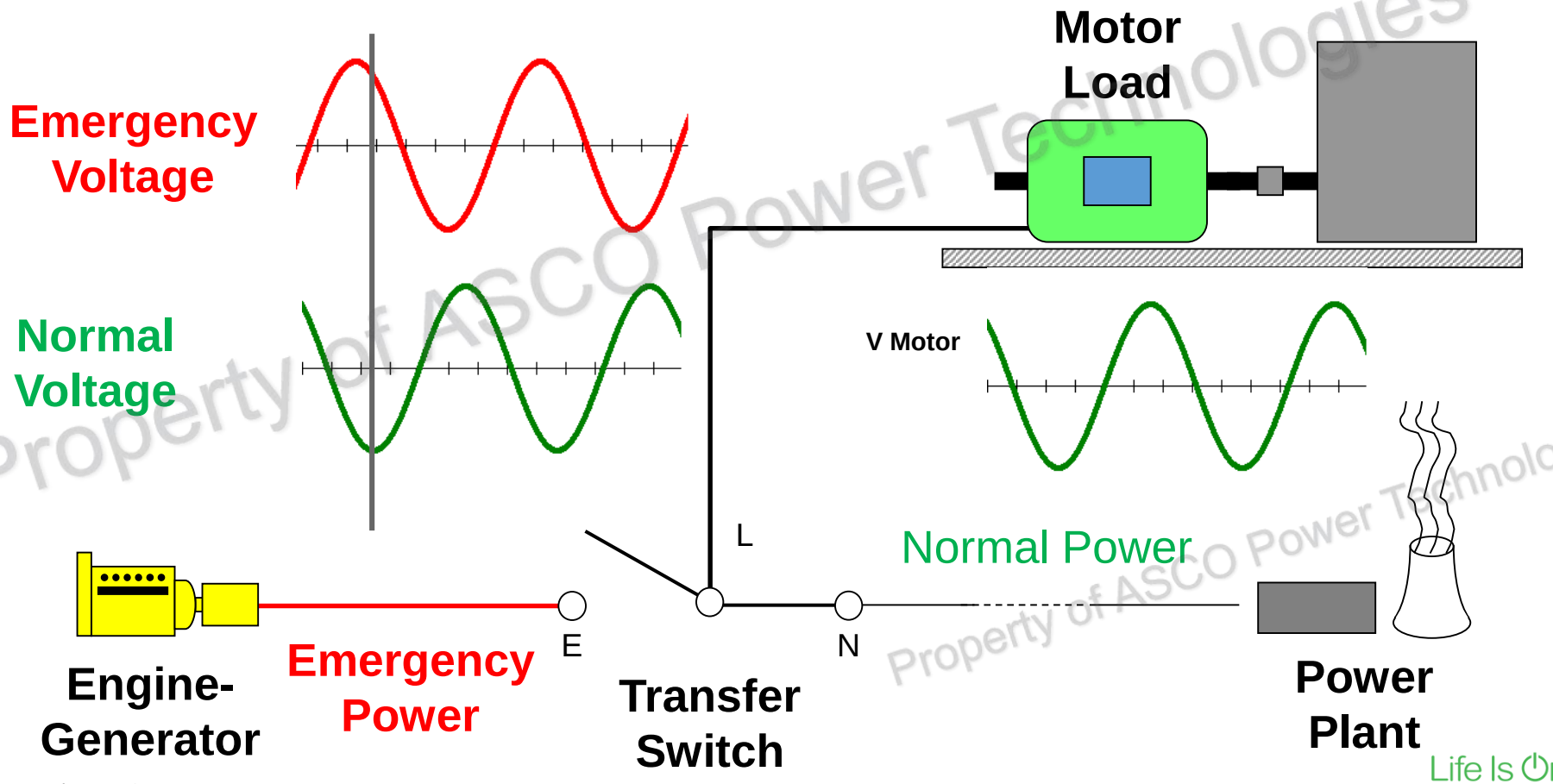
Break-before-Make

Available 30 – 4000 Amperes

7000 SERIES Open Transition Transfer Switch 7ATS

In-phase Transfer

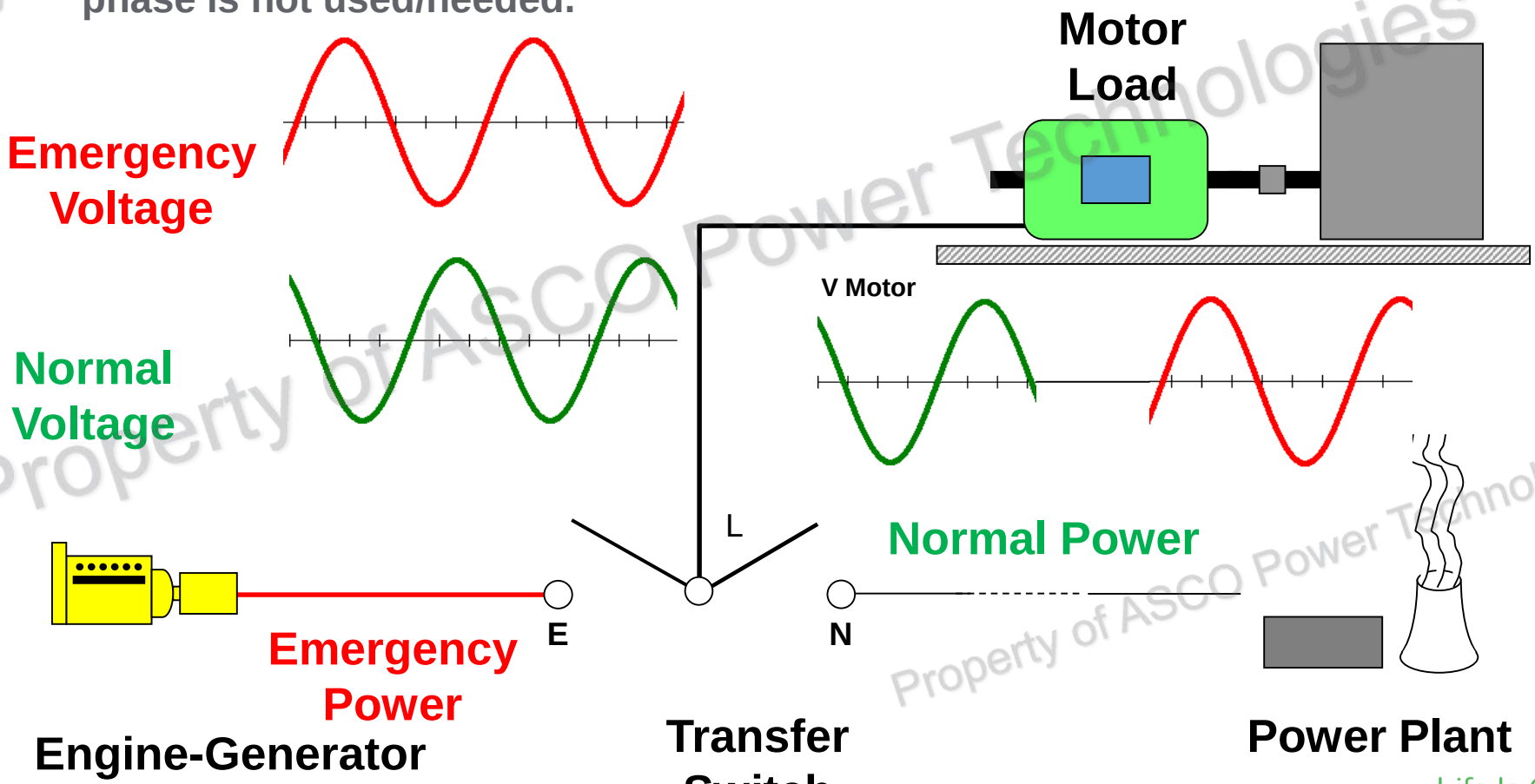
- **What could happen if the 2 sources are not in synch?**



7000 SERIES Open Transition Transfer Switch 7ATS

In-phase Transfer

- Normal-to-Emergency usually has an outage time for generator start, so in-phase is not used/needed.



7000 SERIES Open Transition Transfer Switch 7ATS

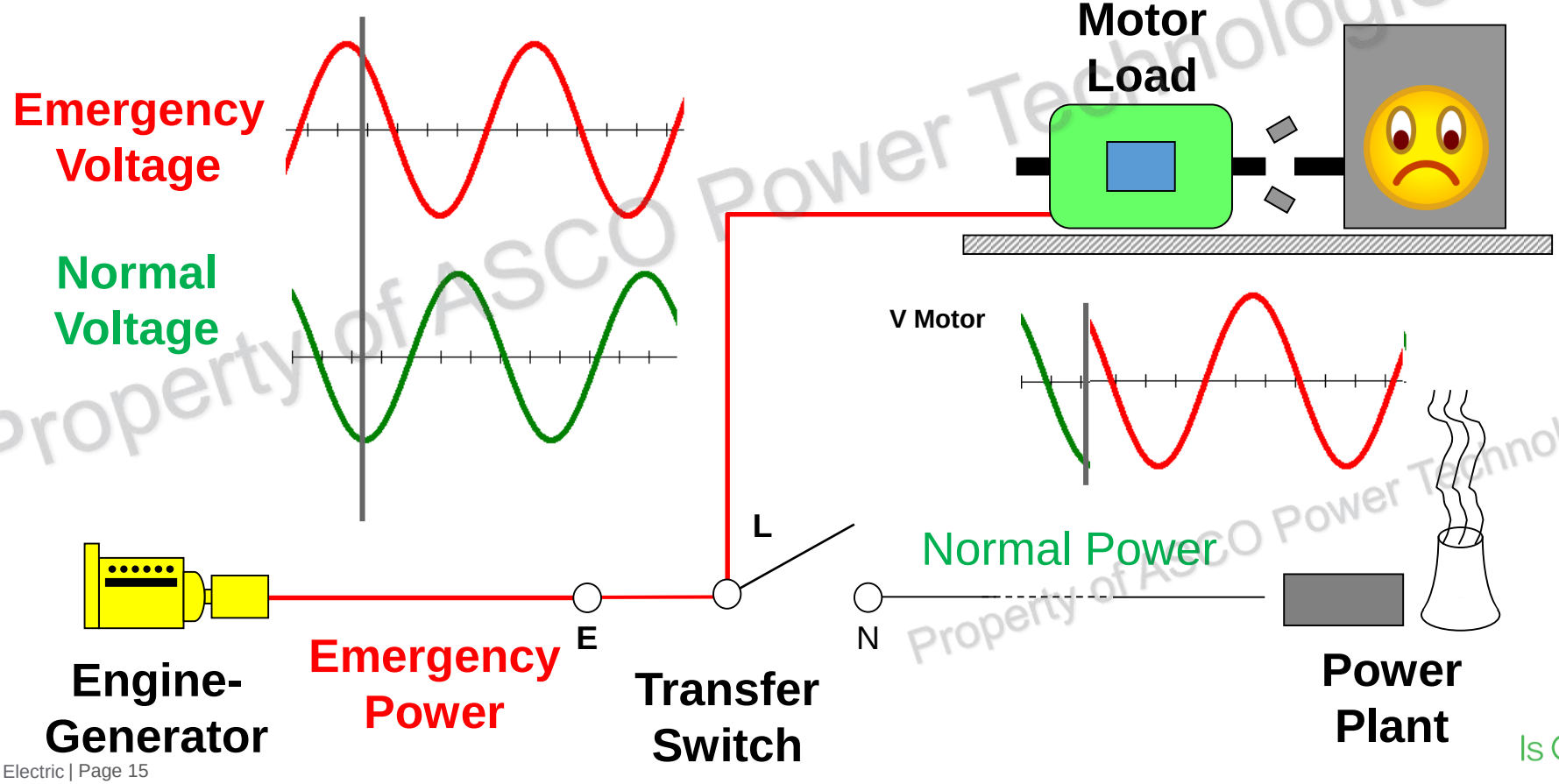
In-phase Transfer

- **Emergency-to-Normal may have very short time delay between the 2 sources with possible catastrophic consequences.**

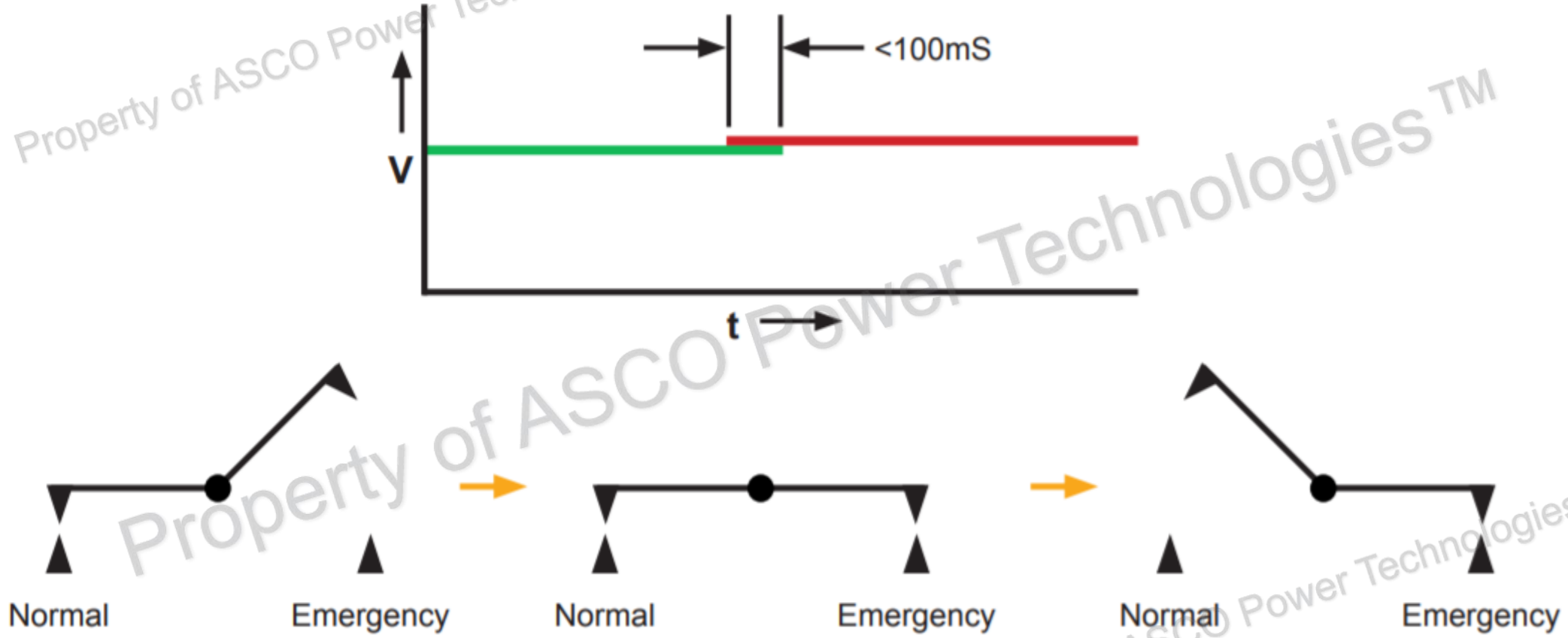
Controller Algorithm

Speed

Consistency



7000 SERIES Closed Transition Transfer Switch 7ACTS



Passive Synchronization

Figure 6: Closed Transition Sequence

Available 150 – 4000 Amperes

7000 SERIES Closed Transition Transfer Switch 7ACTS

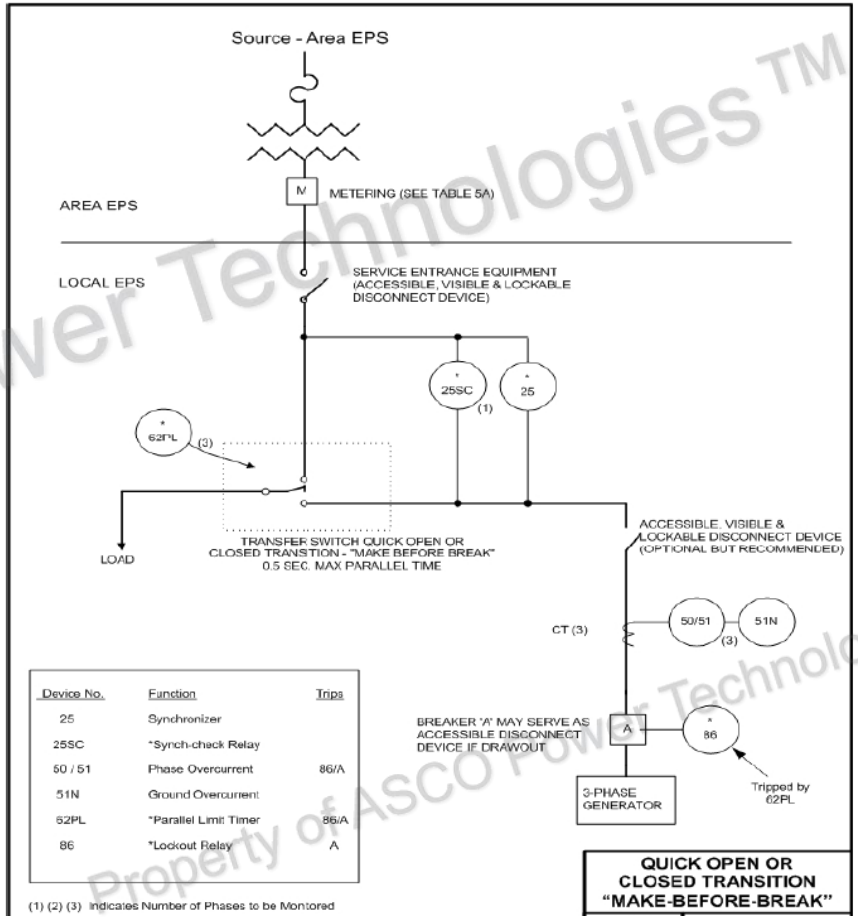
- **Both Sources Must Be Present**
- **Sources Must be in Synchronism**
- **Overlap Shall Not Exceed 100 msec.**
- **Isochronous Type Governor**

MINNESOTA ELECTRIC RATE BOOK - MPUC NO. 2

DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)

Section No. 10
Original Sheet No. 159.3

8. Testing Requirements (Continued)



7000 SERIES Delayed Transition Transfer Switch 7ADTS

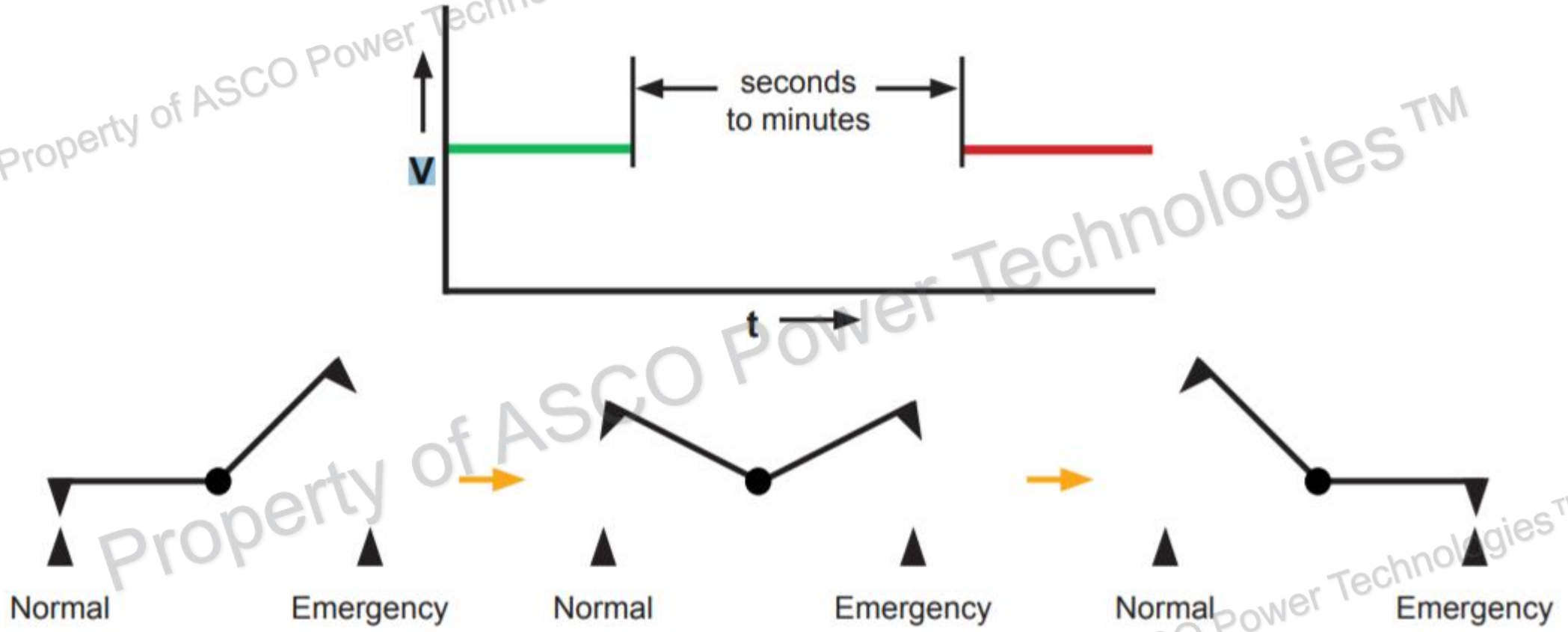


Figure 5: Delayed Transition Sequence

Available 150 – 4000 Amperes

7000 SERIES Delayed Transition Transfer Switch 7ADTS

- Time Delayed Neutral Position to Allow Motor Voltage to Decay
- Mechanical Interlock
- Configurable Time Delay via Control Panel Settings
  - Password Protected
  - Readily Adjustable Through Key Pad or Dip Switches

Specifying Bypass Isolation Transfer Switches

NEC 2020

Essential Electrical Systems (517, 700-702)

- Article 700.5(B) specifies the capability “to bypass and isolate the transfer equipment.”
- NFPA 99, 101 & 110

Critical Operations Power Systems (708.24 (D))

- Bypass Isolation ATS required where COPs loads are supplied by only one transfer switch
- Goal is to facilitate system maintenance 708.6(C)

Examples of Facilities that are Designated as Mission Critical Facilities are:

Data Processing Centers; 911 Call Centers; Hospitals; Transportation and Municipal Infrastructure; Police, Fire, and Civil Defense Stations; Telecommunications Centers; Cell Sites; Air Traffic Control Towers; Water Pumping Stations and Petrochemical Plants.

7000 SERIES Bypass Isolation Transfer Switches

Fig. 5: J-Frame
150-600 amps

Fig. 6: H-Frame
600-1200 amps

Fig. 7: G-Frame
1000-3000 amps

Fig. 8: G-Frame
4000 amps

Available 150 – 4000 Amperes

Specifying Bypass Isolation Transfer Switches

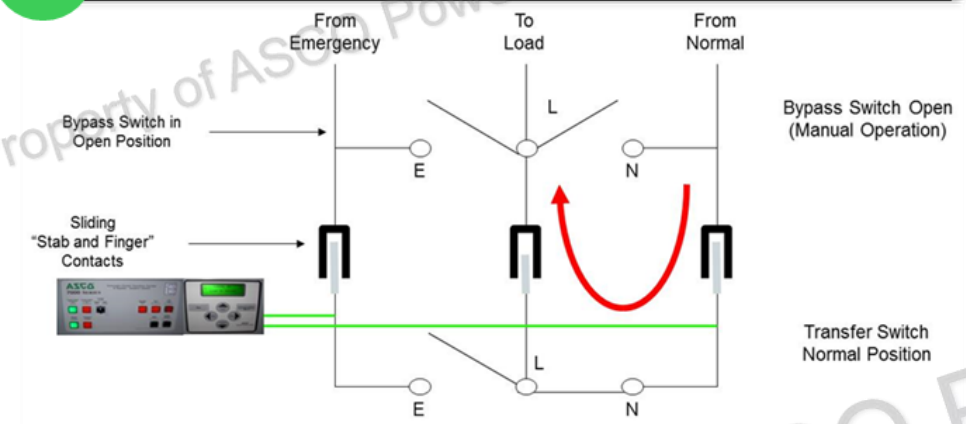
I do not specify it because, facility managers are not using it…

They might be intimidated by it?

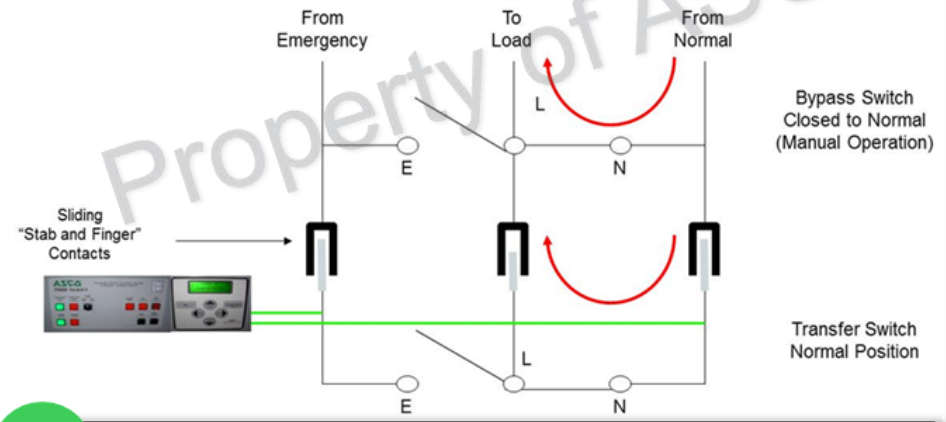
- **Fixed vs. Removable Handles**
- **Dead Front Design (Why open the door?)**
- **Load-break vs. No Load-break Design**

7000 SERIES – Maintenance Bypass Isolation Operation

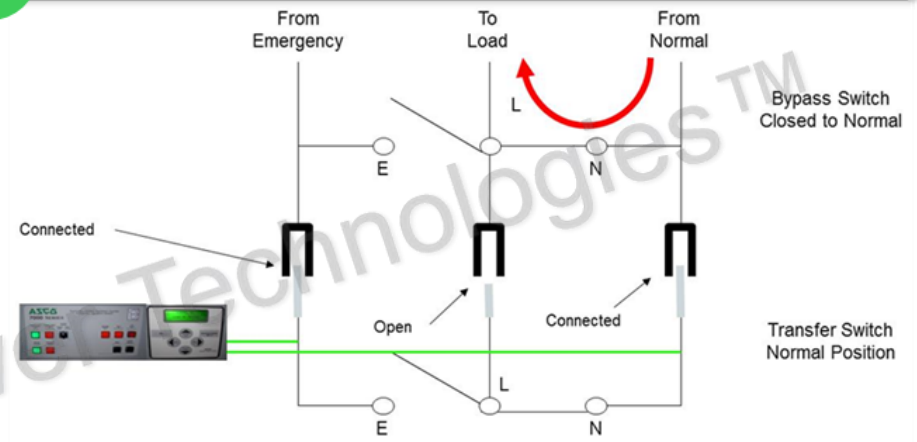
1 Normal State with ATS Connected to Normal Source



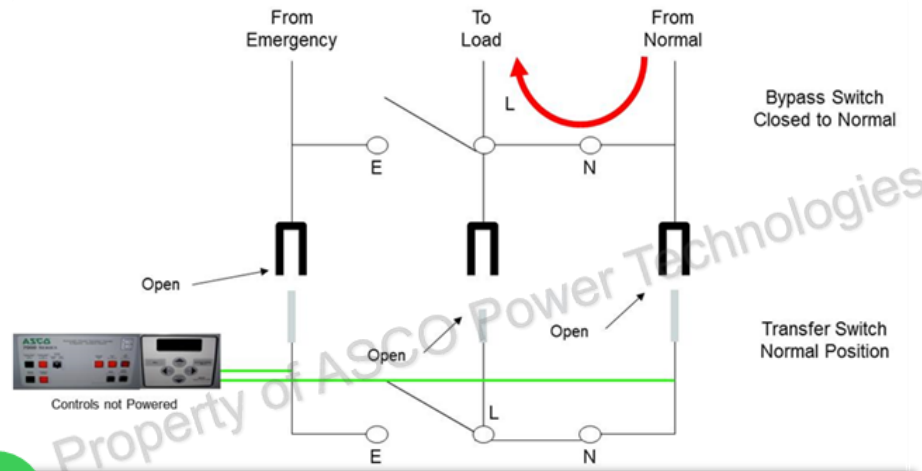
2 Bypass Switch Connected to Normal Source



3 ATS in Test Position with Control Contacts Connected



4 ATS Withdrawn and Available for Maintenance



7000 SERIES Service Entrance Transfer Switches 7AUS

- Available 100 – 4000 Amperes
- UL 1008 Listed, And UL 891 Listed (Switchboard Construction) 250 – 4000 Amps
- Meets NEC Requirements For Use As Service Entrance Equipment
- 100% Rated Breakers For 1000 Amps And Above; 80% below 1000 Amps With Optional 100% Rated Breaker
- Ground Fault Protection Provided On Sizes Of 1000 Amperes And Above
- Type 1, 3R, 4, 4X, 12 Secure Enclosures

Ground And Neutral Disconnect Links

Circuit Breaker Mounted In Separate Compartment For 250 – 4000 Amperes Can Be Operated Without Opening Enclosure Door

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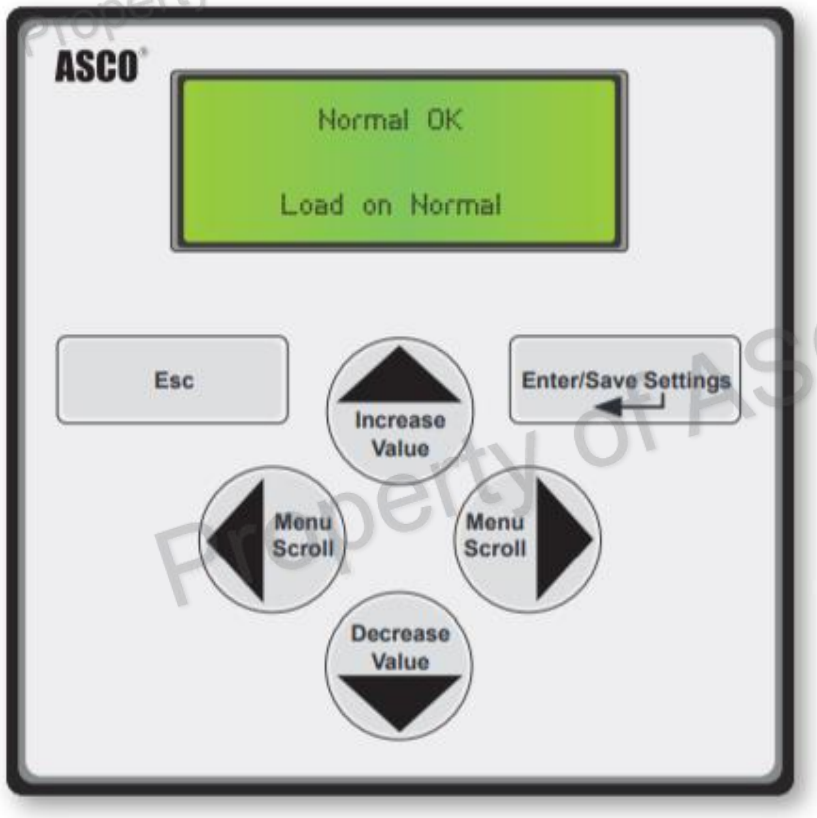
Critical Power ATS Controller

Group 5 Controller
Standard Display



Standard

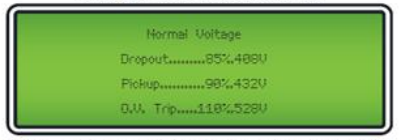
Advanced Touch Display Interface (TDI)
Accessory 150 Tech. Package (see page 16)

Expanded

- Open, Closed or Delayed Transition
- 3-phase Normal and Emergency Monitoring
- Operator Adjustable Time Delays
- Operator Adjustable Frequency and Voltage Pickup and Dropout Settings
- Standard Engine Exerciser

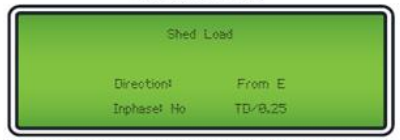
Easy-To-Read Display Indicates System State, Source Voltages, Active Time Delays and Event Log

Voltage and Frequency Settings



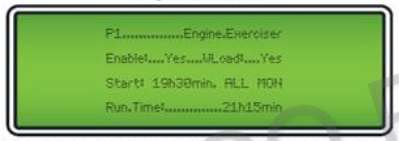
Provides voltage and frequency setting values for normal and emergency sources. Voltage pick-up, dropout and trip settings are set in percentage of nominal voltage and are also displayed in rms voltage values.

Feature Settings



Standard features can be activated with the keypad. As an example, when enabled, the "shed load" option causes the transfer switch to transfer the load off of the specified source. If desired, the load shed transfer can be made inphase.

Engine Exerciser



Seven independent programs, load/no load selection, flexible run times and daily, weekly, bi-weekly and monthly exercise routines.

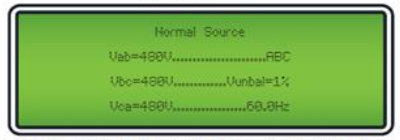
Time Delay Settings

Provides direct reading display for setting time delays.

System Status

Displays system status in clear, concise language. Message shown indicates normal source is acceptable and the load is connected to the normal source.

Source Status



Displays voltage for each phase, frequency, phase rotation and voltage unbalance for both normal and emergency sources.

Time Delay Status

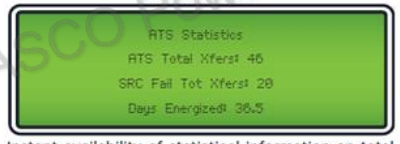
Active time delay status displays time remaining until next control event.

Inphase Transfer Status

Displays the relative phase angle between sources and frequency differential to indicate the controller is awaiting an inphase condition.

- Indication Lights for Connected Source
- Indication Lights for Source Acceptability
- Selector Switch for Transfer Test and Retransfer Time Delay Bypass

ATS Statistics



Instant availability of statistical information on total number of ATS transfers, number of transfers caused by power failures and total days controller has been energized, plus more.

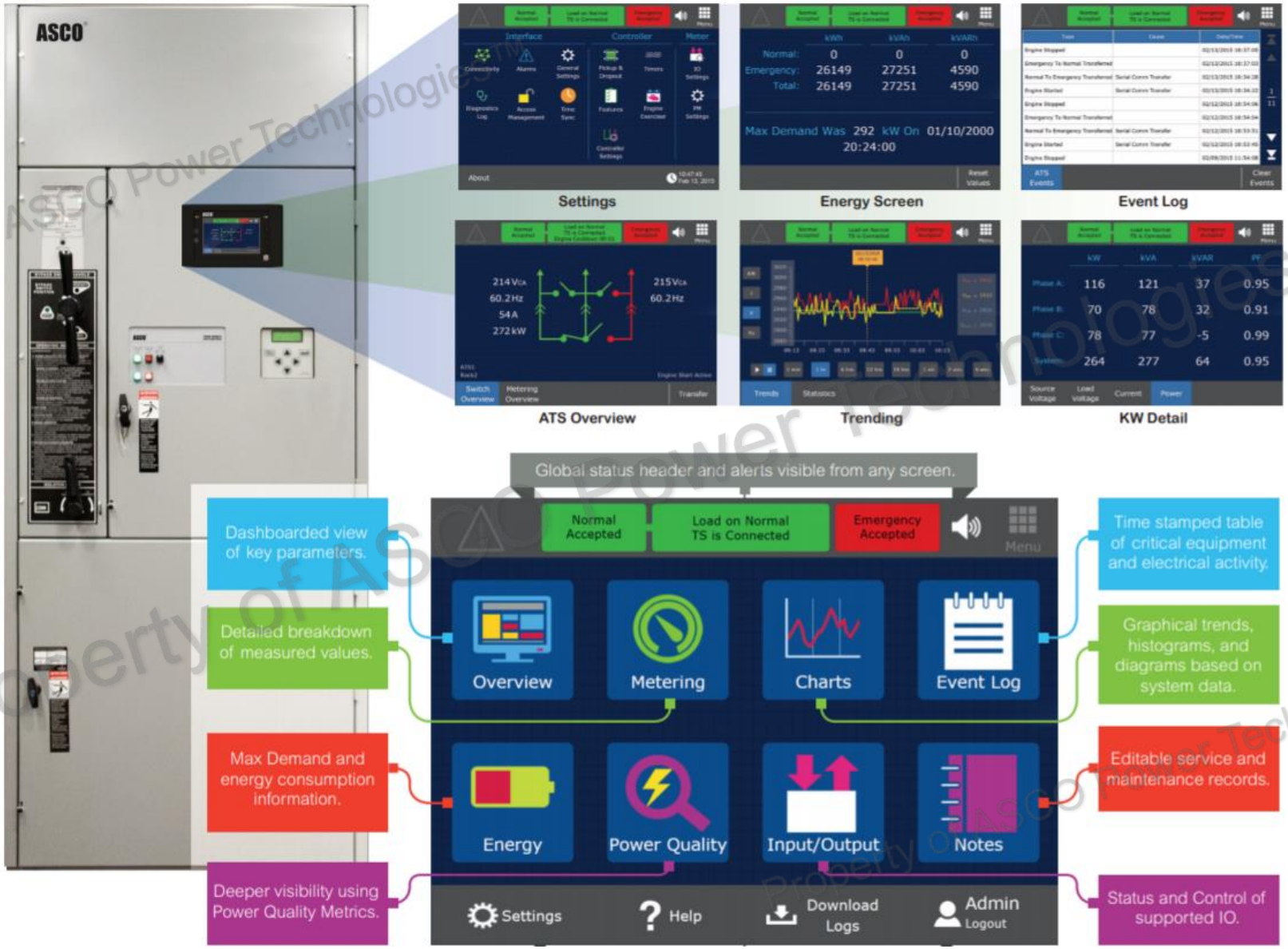
Historical Event Log

Displays detailed information for last 99 events, including time of occurrence, length of event, date and reason for event.

Group 5 Controller

Touch Display Interface

Controller Expanded Options



Hot-Swappable Screen

Premium User-Friendly Experience

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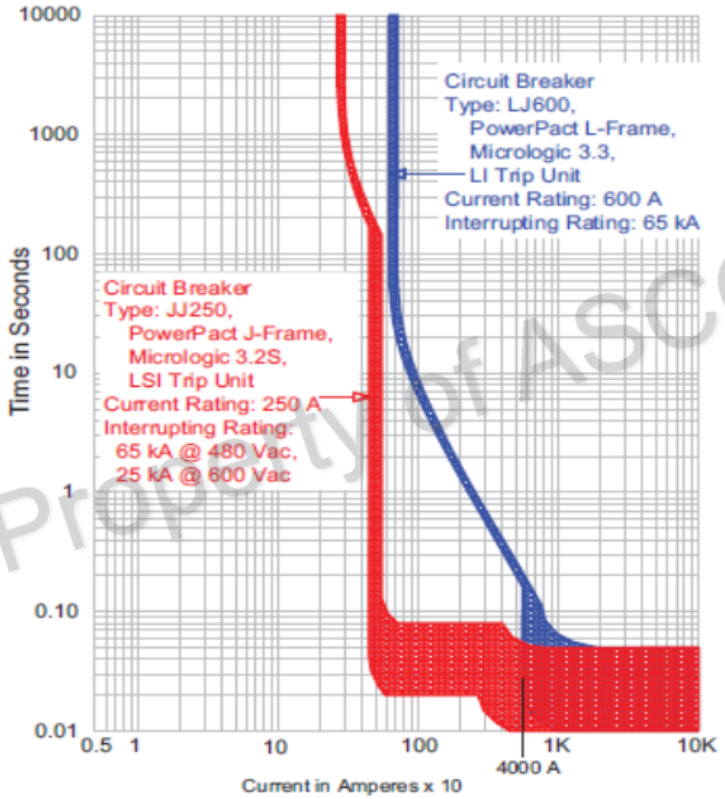
Circuit Breakers (AIC) vs. Transfer Switches (WCR)?

Ampere Interrupting Capacity (AIC) - Capability to **safely interrupt or break** short circuit currents and disconnect the power source from the load under overcurrent conditions.

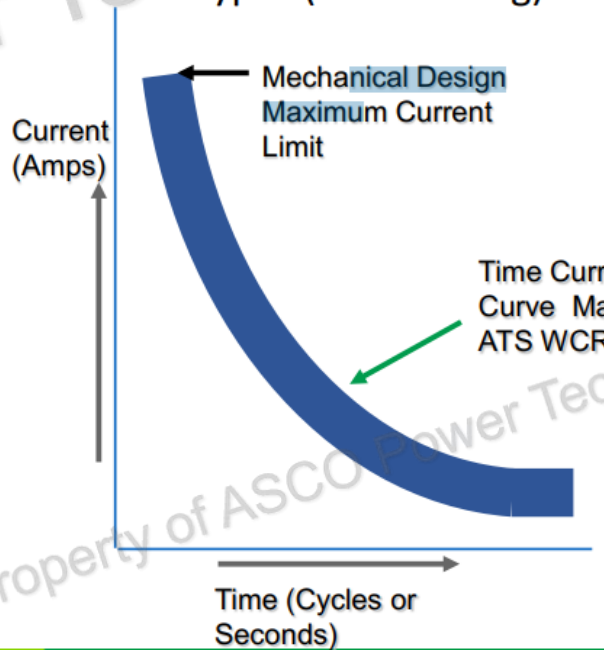
Interrupt Current



Withstand Closing Rating (WCR) - Capability to **safely endure and close-on** short circuit currents until overcurrent conditions are interrupted. These WCR ratings are based on either:

- Specific time durations (time based)
- Coordination with specific circuit breaker or fuse types (series rating)

Maintain Current



Qualifying Specific Breakers Post UL1008, 7th Edition

- Problem: Prior to 7th edition there was **no guarantee that all listed breakers would coordinate with the ATS WCR rating to clear the short circuit safely**
- **Method for listing specific breakers was not defined in the standard** and was based on a comparison of the **"*published*" instantaneous clearing time** between the tested breaker and non-tested circuit breakers.
- **If the non-tested circuit breaker's *published* clearing time was equal to or less than the tested circuit breaker's *published* clearing time, the non tested breaker could be listed.**
- Most switch manufacturers then documented a **formidable list of specific breaker manufacturers and types** on their WCR label at that time.
- the **most significant change in the 7th Edition** requires **comparing the publish trip time of the new breaker with actual breaker trip time from a previous short circuit test.**

New Label
Instantaneous Trip Response

SHORT-CIRCUIT WITHSTAND AND CLOSING RATINGS

WHEN PROTECTED BY A CIRCUIT BREAKER, THIS TRANSFER SWITCH IS SUITABLE FOR USE IN A CIRCUIT CAPABLE OF DELIVERING THE SHORT-CIRCUIT CURRENT FOR THE MAXIMUM TIME DURATION AND VOLTAGE MARKED BELOW.

THE CIRCUIT BREAKER MUST INCLUDE AN INSTANTANEOUS TRIP RESPONSE AND SHALL NOT INCLUDE A SHORT-TIME TRIP RESPONSE.

THE MAXIMUM CLEARING TIME OF THE INSTANTANEOUS TRIP RESPONSE MUST BE EQUAL TO OR LESS THAN THE TIME DURATION SHOWN FOR THE MARKED SHORT-CIRCUIT CURRENT.

SHORT-CIRCUIT CURRENT (RMS SYM AMPS x 1000)	VOLTAGE (VOLTS AC) MAX	TIME DURATION (SEC) MAX
65	240	0.050
42	480	0.050
35	600	0.050

New Label
Short-Time Trip Response

SHORT-CIRCUIT WITHSTAND/CLOSING AND SHORT-TIME CURRENT RATINGS

WHEN PROTECTED BY A CIRCUIT BREAKER, THIS TRANSFER SWITCH IS SUITABLE FOR USE IN A CIRCUIT CAPABLE OF DELIVERING THE SHORT-CIRCUIT CURRENT FOR THE MAXIMUM TIME DURATION AND VOLTAGE MARKED BELOW.

THE CIRCUIT BREAKER MUST INCLUDE AN INSTANTANEOUS TRIP RESPONSE UNLESS THE AVAILABLE SHORT-CIRCUIT CURRENT IS LESS THAN OR EQUAL TO THE SHORT-TIME RATING OF THE TRANSFER SWITCH AND THE CIRCUIT BREAKER INCLUDES A SHORT-TIME TRIP RESPONSE.

THE MAXIMUM CLEARING TIME OF THE INSTANTANEOUS TRIP RESPONSE MUST BE LESS THAN OR EQUAL TO THE TIME DURATION SHOWN FOR THE MARKED SHORT-CIRCUIT CURRENT.

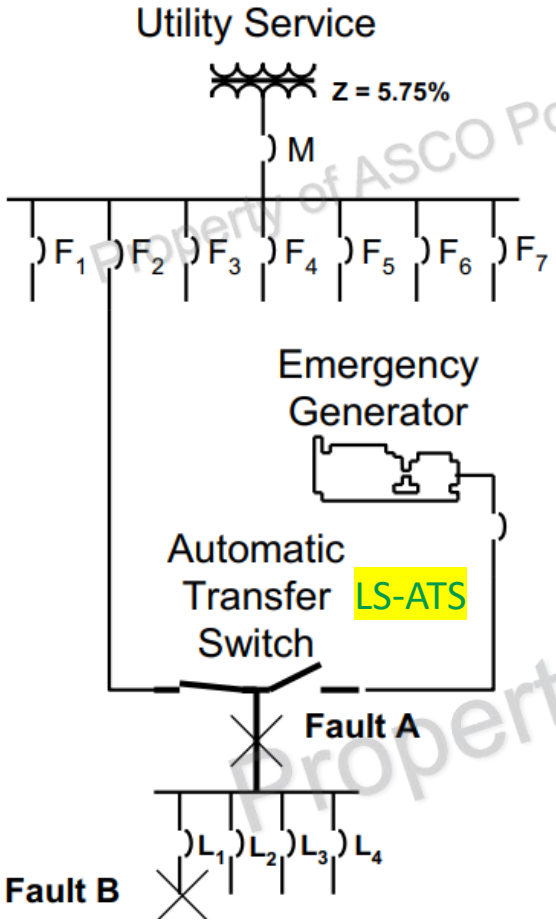
WHEN PROTECTED BY A CIRCUIT BREAKER WITH A SHORT-TIME TRIP RESPONSE, THE SHORT-TIME RESPONSE OF THE CIRCUIT BREAKER MUST BE COORDINATED WITH THE SHORT-TIME CURRENT RATING OF THE TRANSFER SWITCH AS MARKED BELOW.

SHORT-CIRCUIT CURRENT (RMS SYM AMPS x 1000)	VOLTAGE (VOLTS AC) MAX	TIME DURATION (SEC) MAX
50	600	0.050

SHORT-TIME CURRENT (RMS SYM AMPS x 1000)	VOLTAGE (VOLTS AC) MAX	TIME DURATION (SEC) MAX
36	600	0.3

UL 1008 7th Edition – New Label Requirements

7000 SERIES – Short Time Ratings (9-30 cycles WCR)



Critical loads

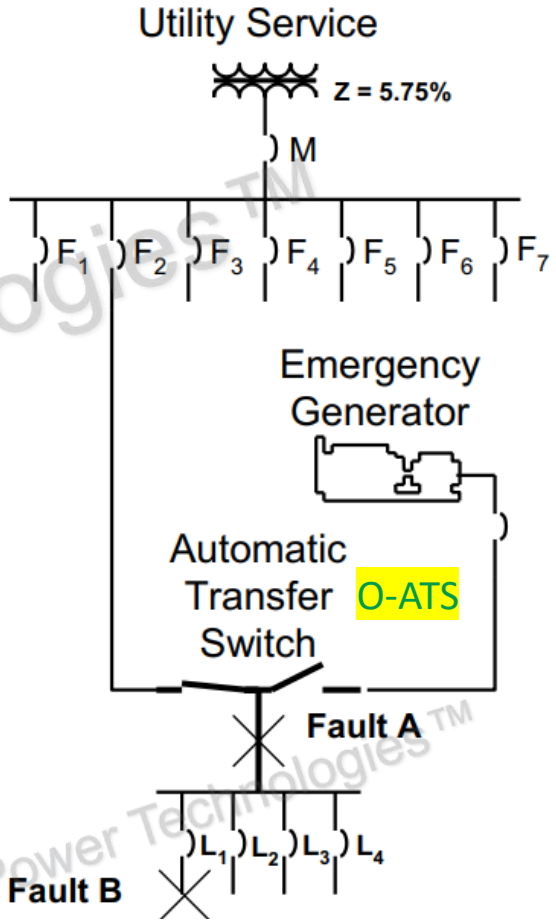
Figure 1. Line diagram of a typical emergency power system.

Critical Power Design/Strive for Excellence

What should happen when the following occurs:

- Fault A – Downstream of Optional ATS
- Fault **B** – Downstream of Optional ATS

Why Short Time Ratings? Selective Co-ordination!!! Localization of an overcurrent condition to restrict outages to the circuit or equipment affected



Optional loads

Figure 1. Line diagram of a typical emergency power system.

7000 SERIES - UL 1008 Withstand And Close - On Ratings

Frame	Switch rating (Amps)		Current Limiting Fuses				Specific Breaker			Time Based				Short Time Ratings[3] (sec)							
														480V Max.				600V Max.			
	Transfer Switches	Bypass Switches	480V Max.	600V Max.	Max Size, A	Class	240V Max.	480V Max.	600V Max.	Time (sec)	240V Max.	480V Max.	600V Max.	.13	.2	.3	.5	.1	.13	.3	.5
D	30	-	100kA	-	300	J	22kA	22kA	10kA	0.025	10kA	10kA	10kA	-				-			
			200kA	35kA	200	J															
			35kA	35kA	200	RK1															
D	70, 100	-	35kA	35kA	200	RK1	150kA	85kA	25kA	0.025	10kA	10kA	10kA	-				-			
			200kA	35kA	200	J															
D	150	-	35kA	35kA	200	RK1	150kA	85kA	25kA	0.025	10kA	10kA	10kA	-				-			
			200kA	35kA	200	J															
D	200	-	200kA	-	200	J	200kA	85kA	14kA	0.025	10kA	10kA	10kA	-				-			
D	230	-	100kA	-	300	J	200kA	85kA	14kA	0.025	10kA	10kA	-	-				-			
E	260, 400	-	100kA	-	600	J	65kA	42kA	35kA	0.05	35kA	35kA	22kA	-				-			
J	150, 200, 260	150, 200, 230, 260	200kA	200kA	600	J	200kA	200kA	42kA	0.05	65kA	42kA[5]	35kA	7.5kA		-		-			
					800	L															
J	400	400	200kA	200kA	600	J	65kA	50kA	42kA	0.05	65kA	42kA[5]	35kA	7.5kA		-		-			
					800	L															
J	600	600	200kA	200kA	800	L	65kA	50kA	42kA	0.05	65kA	42kA[5]	35kA	7.5kA[9]		-		-			
			200kA	200kA	600	J															
H[8]	600	600	200kA	200kA	1600	L	65kA	65kA	65kA	0.05	50kA	50kA	50kA	36kA		-		36kA		-	
P[8]	600	600	200kA	200kA	1600	L	65kA	65kA	65kA	0.05	50kA	50kA	50kA	36kA		30kA		36kA		-	
P[8]	800	800 - 1200	200kA	200kA	1600	L	65kA	65kA	65kA	0.05	50kA	50kA	50kA	36kA		30kA		36kA		-	
H	800 - 1200	800 - 1200	200kA	200kA	1600[4]	L	65kA	65kA	65kA	0.05	50kA	50kA	50kA	36kA		-		36kA		-	
Q[8]	600 - 1600	600 - 1600	200kA	200kA	2000	L	65kA	65kA	65kA	0.05	65kA	65kA	65kA	50kA				50kA			
S[8]	800 - 1200	800 - 1200	200kA	200kA	2500	L	100kA	100kA	65kA	0.05	100kA	100kA	65kA	65kA				65kA			

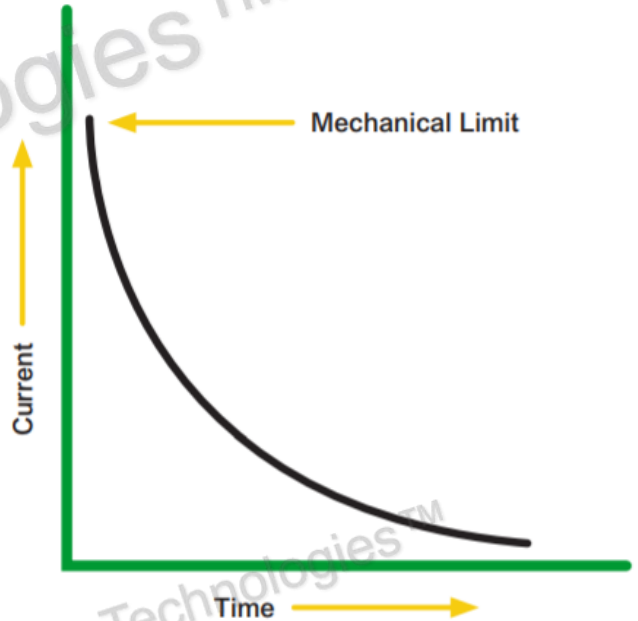


Figure 1: Inverse Relationship of Current and Time

Specifying Short Time Ratings – 26 36 00

2.04 TRANSFER-SWITCH TYPE ELECTRICAL CHARACTERISTICS AND OPTIONS

A. Manual, Automatic, Open-Transition, Closed-Transition, or Bypass/Isolation type as indicated on the Drawings.

2.05 GENERAL TRANSFER-SWITCH PRODUCT REQUIREMENTS

A. Indicated Current Ratings: Apply as defined in UL 1008 for continuous loading and total system transfer, including tungsten filament lamp loads not exceeding 30 percent of switch ampere rating, unless otherwise indicated.

B. Tested Fault-Current Closing and Withstand Ratings: Adequate for duty imposed by protective devices at installation locations in Project under the fault conditions indicated, based on testing according to UL 1008.

1. Where transfer switch includes internal fault-current protection, rating of switch and trip unit combination shall exceed indicated fault-current value at installation location.
2. Short-time withstand capability:

a. Three cycles, minimum for all equipment under 600 amperes.
b. 15 cycles, minimum for all equipment 600 amperes or greater.

2.02 GENERAL TRANSFER-SWITCH PRODUCT REQUIREMENTS

A. Indicated Current Ratings: Apply as defined in UL 1008 for continuous loading and total system transfer, including tungsten filament lamp loads not exceeding 30 percent of switch ampere rating, unless otherwise indicated.

B. Tested Fault-Current Closing and Withstand Ratings: Adequate for duty imposed by protective devices at installation locations in Project under the fault conditions indicated, based on testing according to UL 1008.

1. Where transfer switch includes internal fault-current protection, rating of switch and trip unit combination shall exceed indicated fault-current value at installation location.

2. Short-time withstand capability:
   a. 18 cycles, minimum for all equipment.

Critical Power Product Overview Road Map

- Critical Power Market Segments/Applications
- 7000 SERIES Product Features
- 7000 SERIES Product Platforms
- Critical Power ATS Controller
- Withstand And Close On Ratings
- **7000 SERIES Optional Accessories**
- Custom-Engineered Transfer Switches
- Review

7000 SERIES Optional Accessories

- **Indicators**
  - 14A/14B – Additional Aux Contacts To Indicate Switch Position
  - 18B, 18G – Form C 2P D/T Throw Contacts For Source Availability
- **Customer Control Circuits**
  - 17AL – Preferred Source Selector Switch (Peak Shave)
  - 30* – Load Shedding Circuit (Non-essential Loads)
  - 31Z – Selective Load Disconnect Control Contacts (Elevator)
  - 43R – Terminal Block for all Customer Control Connections
- **Surge Protection**
  - 73* – ASCO TVSS, rated 50kA to 100kA Per Mode – Can be Connected to Normal, Emergency, or Load Terminals
- **Strip Heater**
  - 44G – Strip Heater With Thermostat
- **Extension Harness**
  - 37B – Six Foot (6') Extension Harness to Increase Distance Between Transfer Switch and Control Panel
- **Bypass-Isolation Switch Options**
  - 14* - Aux Contact for various Positions
  - 82C – Automatic Shutters for Bus Isolation with Switch Withdrawn

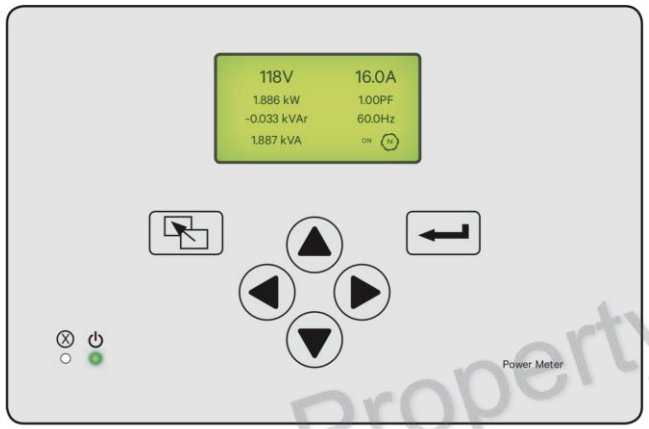
- **Time Delay**
  - 1G – External 24 VDC Input Signal To Controller To Maintain Power When Both Power Sources Are De-Energized
  - 1PS1- Provides Backup Power For Communications When Power Is Lost With Terminal Block For External 24 VDC
  - 2C – Extended Time Delay on Engine Start
- **Manual Controls For Automatic Transfer Switches**
  - 6C – Reset Switch For Manual Retransfer To Normal With Automatic Retransfer In The Event Of Emergency Source Failure
  - 6D – Selector Switch For Automatic/Manual Retransfer To Normal. Automatic Bypass If Emergency Fails
- **Special Applications**
  - 29A – Priority Source Selector Switch Between Two Utility Sources
  - 63 – Special Lug Configurations – Crimp Lugs, Bus Risers etc.
  - 111A – Controls For Gen to Gen for Standby Applications
  - 111B – Controls For Gen to Gen for Prime Power Applications
  - 125A – Seismic Certification – IBC
  - 131 – Certification Of Compliance With ARRA (Buy American)

7000 SERIES Optional Accessories - Metering

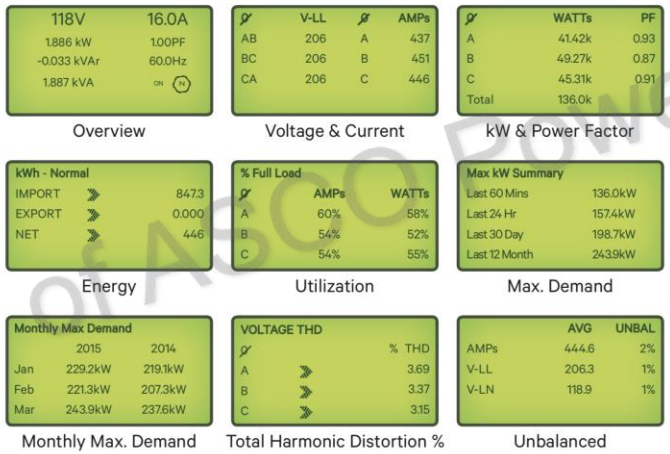
Real-Time Monitoring

Utilization & Load Planning

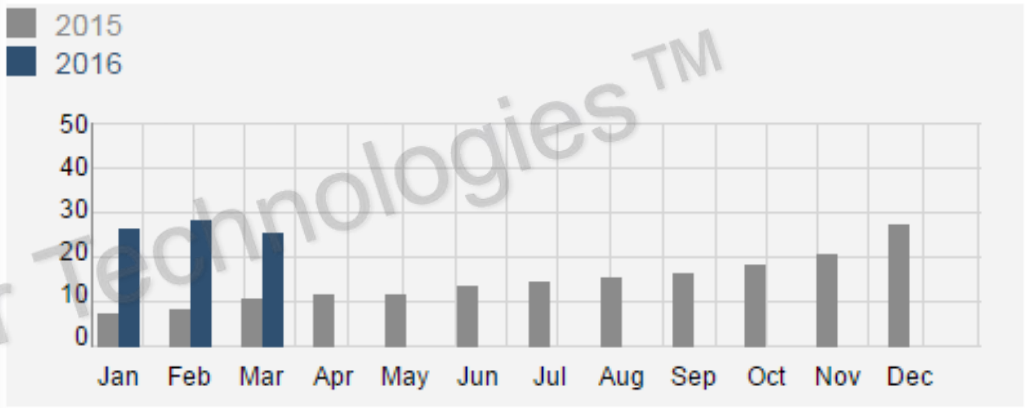
Energy Management



The DPM includes a backlit graphic LCD display and membrane control (keys). All monitoring and control functions can be done from the front of the unit for convenience and safety.



24-Month Peak Demand by Each Month

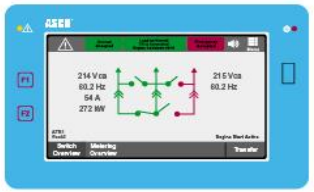


Optional Accessory – 135* (Load Metering)

7000 SERIES Optional Accessories – Tech Package

Graphical Color Touch Interface

Simplifies transfer switch and engine-generator operation and management



24-Months

of power load demand data

Logs 1000 Events

- Transfer Switch
- Bypass transfer switch
- Engine-generator

Download all logs to your USB drive

Mobile Web App

allows you to monitor your transfer switch and engine-generator on-the-go

Increase Efficiency

by increasing operational effectiveness and energy efficiency.

Sends Out Real-Time Alarms

through E-Mail and Text Messages

4 Weeks

of historical energy trending data with ability to zoon in to 1-second resolution.

Compatible

with building, monitoring, and IT monitoring systems using

OPEN MODBUS and SNMP PROTOCOLS

Enables Regulatory Reporting

for ASCO 5700 Series automated NFPA, Joint Commission, and CALEA compliance reporting tools.

Enhances Security

using NIST compliant AES 128-bit Encryption and Multi-level Authentication

25 Seconds

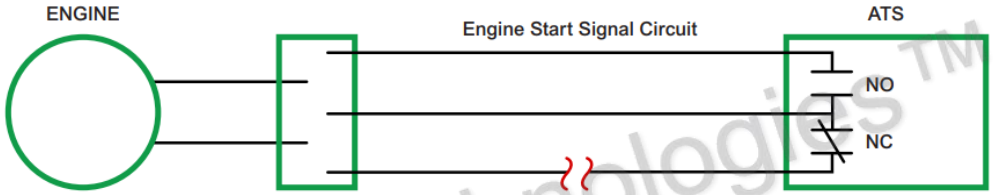
of power outage ride-through for ATS controller and communications.

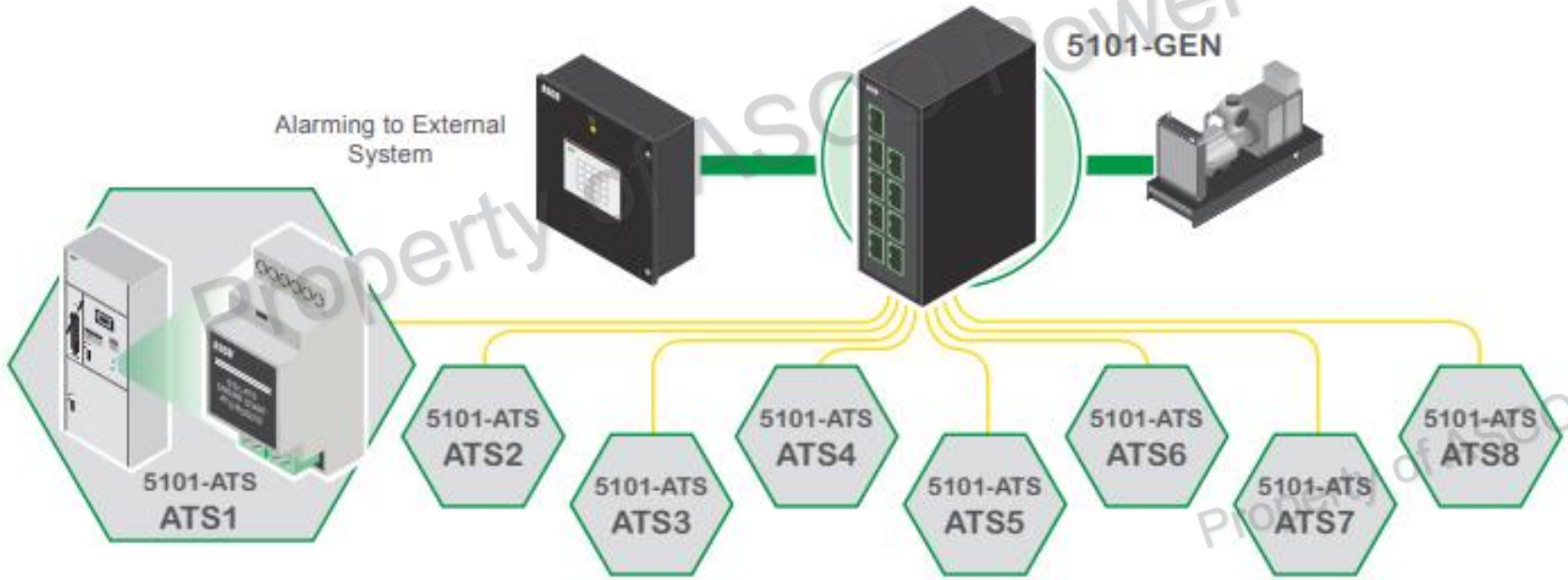
Optional Accessory – 150*

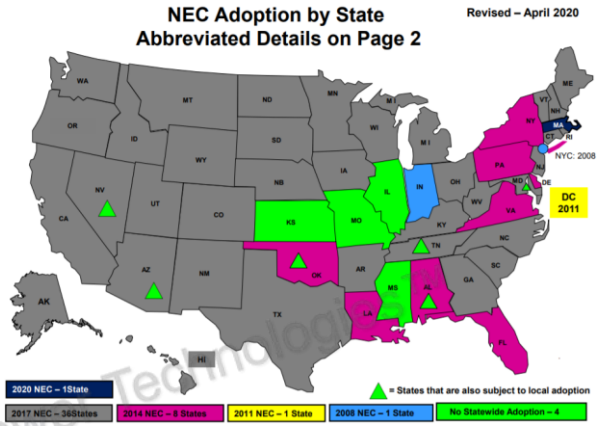
7000 SERIES Optional Accessories – 5101

Compliance with New Requirement requires:

1. Continuous Monitoring of Gen Signaling Circuits
2. Visual and Audible Annunciation of Changes in State
3. Automatic Transmission of an Engine Start Signal and Alarm when a Problem is Detected







Optional Accessory – 7ES

Monitoring of EPSS

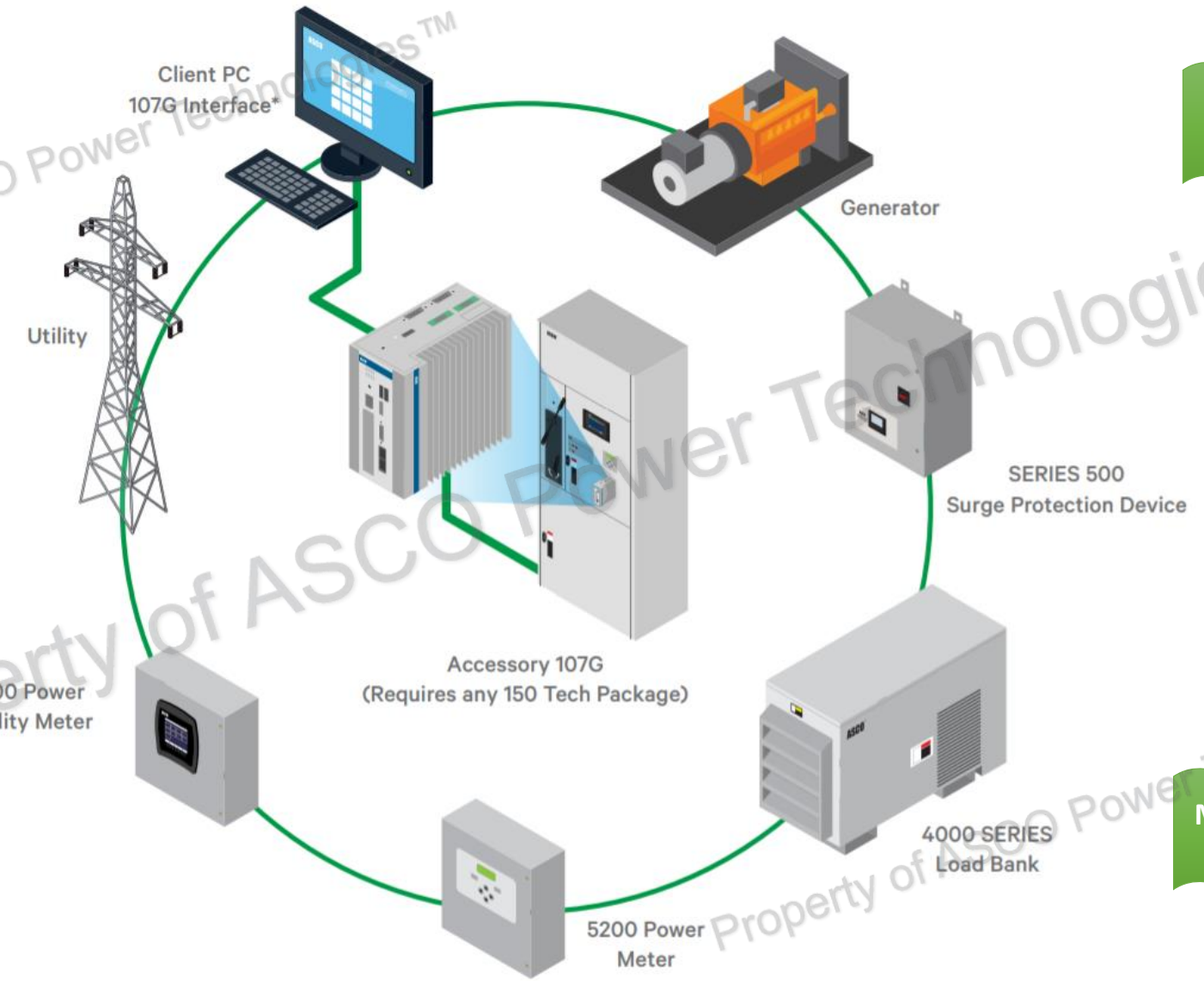
Simplify NFPA 110

Email and Text Alarms and Event Conditions

Simplify BMS Integration

Joint Commission Compliance

Modbus TCP/IP BACnet IP



Optional Accessory – 107G

7000 SERIES Optional Accessories - Annunciators

5350 8-ATS Annunciator

Cat. 5350

Cat. 5310

5705 8-Device Annunciator

Cat. 5705

Specifying Advanced Annunciator – 26 36 00

BMS Compatibility

NFPA 110 Compliant

b. Adjustable time-delay for transferring to "emergency" and to "normal."
c. Adjustable time-delay for engine cool down.
d. Manual bypass button to allow bypass of time-delay back to normal power.
e. Engine start adjustable time-delay.
f. AC metering for amperes, voltage, frequency, running time, KVA/PF loads on each side.
g. Programmable Microprocessor Controlled.

2.05 REMOTE ANNUNCIATOR AND CONTROL SYSTEM

B. Annunciator Panel: Graphical touch screen with the following capabilities.

1. Mounting: Flush, modular, steel cabinet, unless otherwise indicated.
2. Digital Communication Capability: Matched to that of transfer switches supervised.
3. Compatible with Building Monitoring Systems via open SNMP, Modbus TCP/IP and BACnet™ IP protocols.
4. ATS and Generator reporting with Settings, Energy, Testing and Outage reports.
5. NFPA 110 Generator Information.
6. Generator real-time performance dashboard, including, but not limited to, engine speed, oil pressure, coolant temperature, and fuel level.
7. Alarm reporting via email and text.
8. Web-based remote access capability and remote testing of power generators and transfer switches

Email & Text Alerts

EPSS Reporting

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Custom Transfer Switches – Full Capability

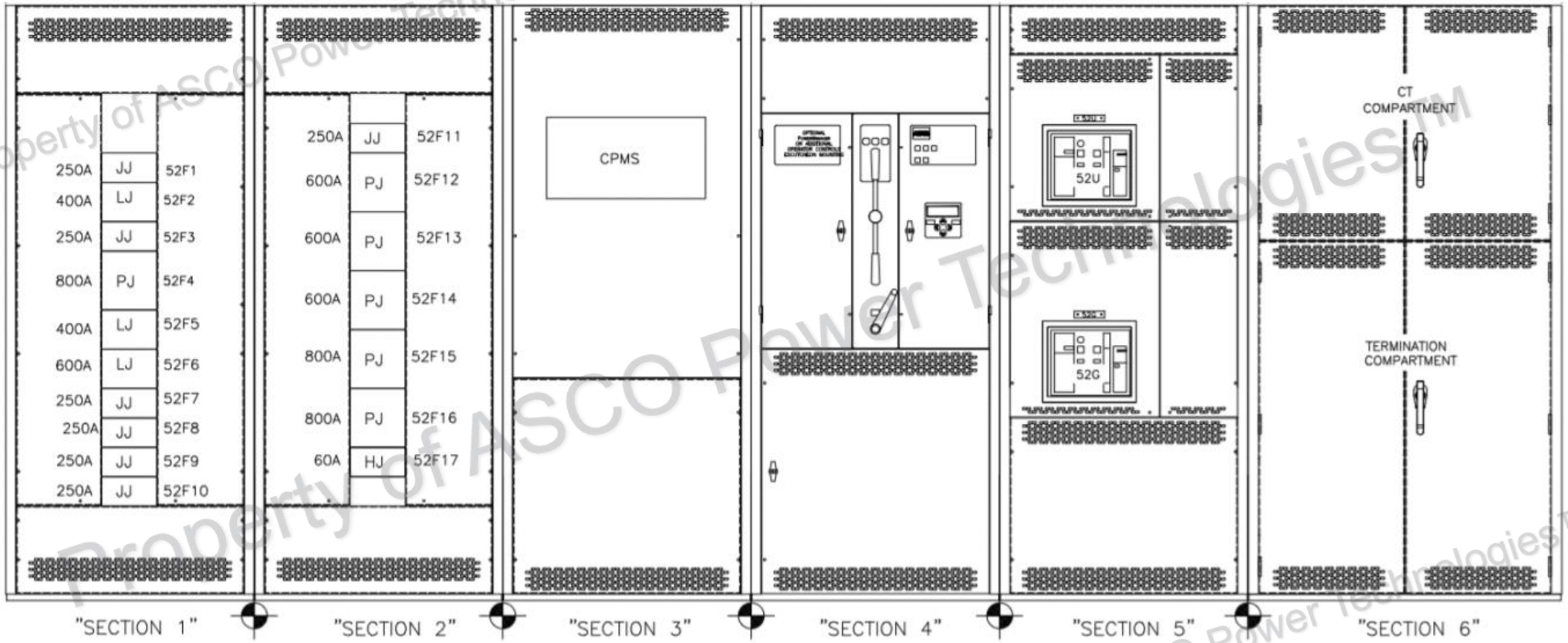


Figure 5: This ASCO 3,000 Amp 7000 SERIES Automatic Isolation-Bypass Switch lineup includes power distribution circuit breakers in Sections 1 & 2, a Continuous Power Monitoring System (Section 3), circuit breakers for the Normal and Emergency sources (Section 5), and current transformer and utility termination compartments in Section 6.

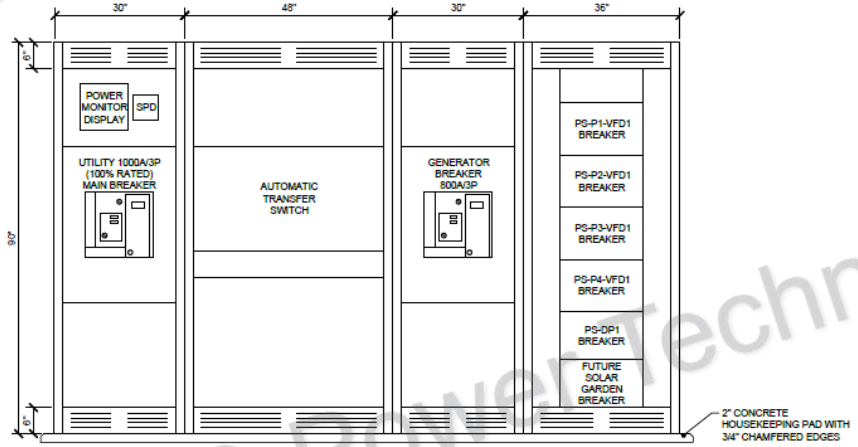
Benefits of Custom-Engineered Transfer Switches

- **Reduced Space**
  - Equipment provided by different vendors will typically be mounted in a separated location, often in a separate enclosure for each component
- **Reduced Lead and Construction Times**
  - Instead of purchasing through separate multiple channels, multiplying the effort required to procure
- **Reduced Installation Labor**
  - Simplified installation
- **Lower Overall Installed Cost**
  - Integrated solutions typically cost less than installing separate power devices
- **Enhanced Quality Control**
  - Factory-assembled, tested and provided as a single deliverable

Single Source – A Unified Solution from a Single Manufacturer Streamlines Equipment Design, Procurement, and Installation because all the Related Services can be Undertaken through a Single Source

Custom Transfer Switches – Case Study

WWTP
Southwest
Minnesota



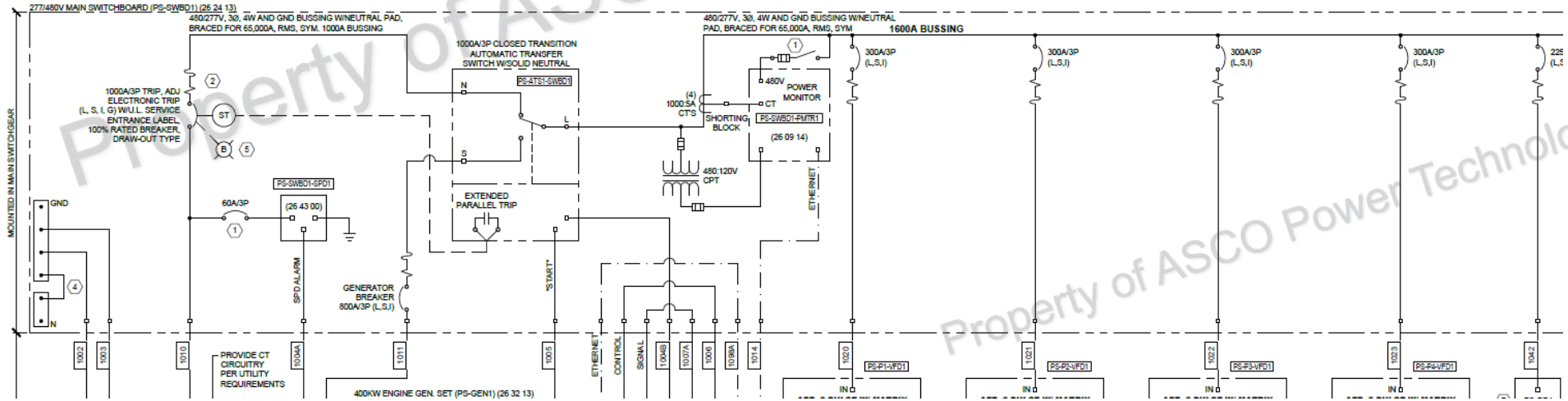
1 PS E601 **277/480V MAIN SWITCHBOARD ELEVATION**
SCALE:NONE (PS-SWBD1)

GENERAL NOTES

1. SEE SHEET GEN/E001 FOR GENERAL NOTES.

CONSTRUCTION NOTES

1. PROVIDE MANUFACTURER RECOMMENDED DISCONNECT.
2. PROVIDE MAIN BREAKER WITH SHUNT TRIP. BREAKER TO TRIP WHEN GENERATOR IS PARALLELED WITH UTILITY FOR OVER 6 CYCLES. PROVIDE AS A RACK OUT BREAKER THAT IS PAD LOCKABLE WHEN RACKED OUT.
3. GROUND FAULT IS NOT TO TRIP THE GENERATOR BREAKER RATHER IT SHALL BE MONITORED AND BROUGHT INTO THE GENERATOR CONTROLLER AND MONITORED OVER SCADA.
4. NEUTRAL TO GROUND SERVICE ENTRANCE BONDING STRAP.
5. INCLUDE UTILITY MAIN WITH ARC FLASH REDUCTION MAINTENANCE SWITCH.
6. BREAKER HAS TO BE SUITABLE FOR BACKFEEDING.
7. SEE PANEL SCHEDULE FOR DETAILS.



Custom Applications – Smart Power Transfer Board

ASCO 5700 Power Management Gateway
Continuously monitors, aggregates and enables consolidated local & remote management wirelessly.

Touchscreen HMI
Centralized consolidated 10inch capacitive touchscreen interface.

Easergy TH110 & CL110 Wireless Thermal Sensors
Continuously thermal and humidity monitoring of sources and load connections.

ASCO 5401 Multi-circuit Monitoring with IO
Monitors status, energy-usage, power quality and demand of distribution circuit breakers.

PowerLogic PM8000 with ION Technology
Analyze power quality of utility, generator and loads.

ASCO 5112 Ethernet IO Module
Enables bypass transfer switch monitoring.

ASCO 146G Generator Communications Card
Communications interface for modern generators from all major manufacturers.

From Reactive to Proactive

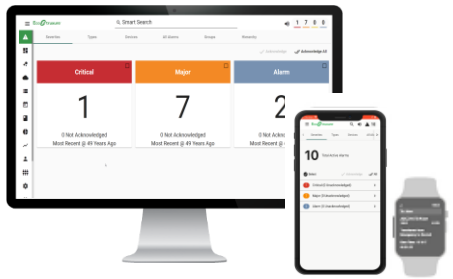
ASCO 7000 SERIES Automatic Transfer Switch
Automatic power source transfer & retransfer.

ASCO 7000 SERIES Manual Bypass Transfer Switch
Manual redundant & back up power switching.

SquareD MasterPact MTZ Circuit Breaker
Service entrance circuit breaker protection, coil monitoring & ERMS.

SquareD PowerPact Circuit Breakers
Distribution circuit breakers.

ASCO SERIES 400 Surge Protection w/ Active Surge Monitoring
All-in-one surge protection device & active surge monitoring.



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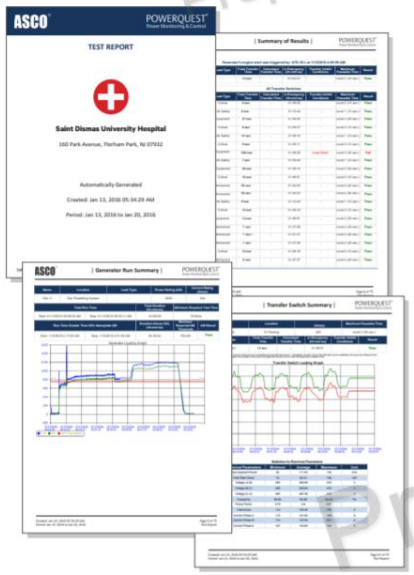
- Concurrent Maintainability
- Maximize Uptime
- Fault Tolerance

ALERTS & NOTIFICATIONS

CRITICAL FACILITIES

CPMS USER INTERFACE



GENERATOR

POWER
CONTROL SYSTEMS

TRANSFER SWITCH

SWITCHBOARDS
& PANEL BOARDS

LOAD BANKS

UTILITY

POWER
DISTRIBUTION UNITS

SURGE
MONITORING SYSTEM

POWER METERS

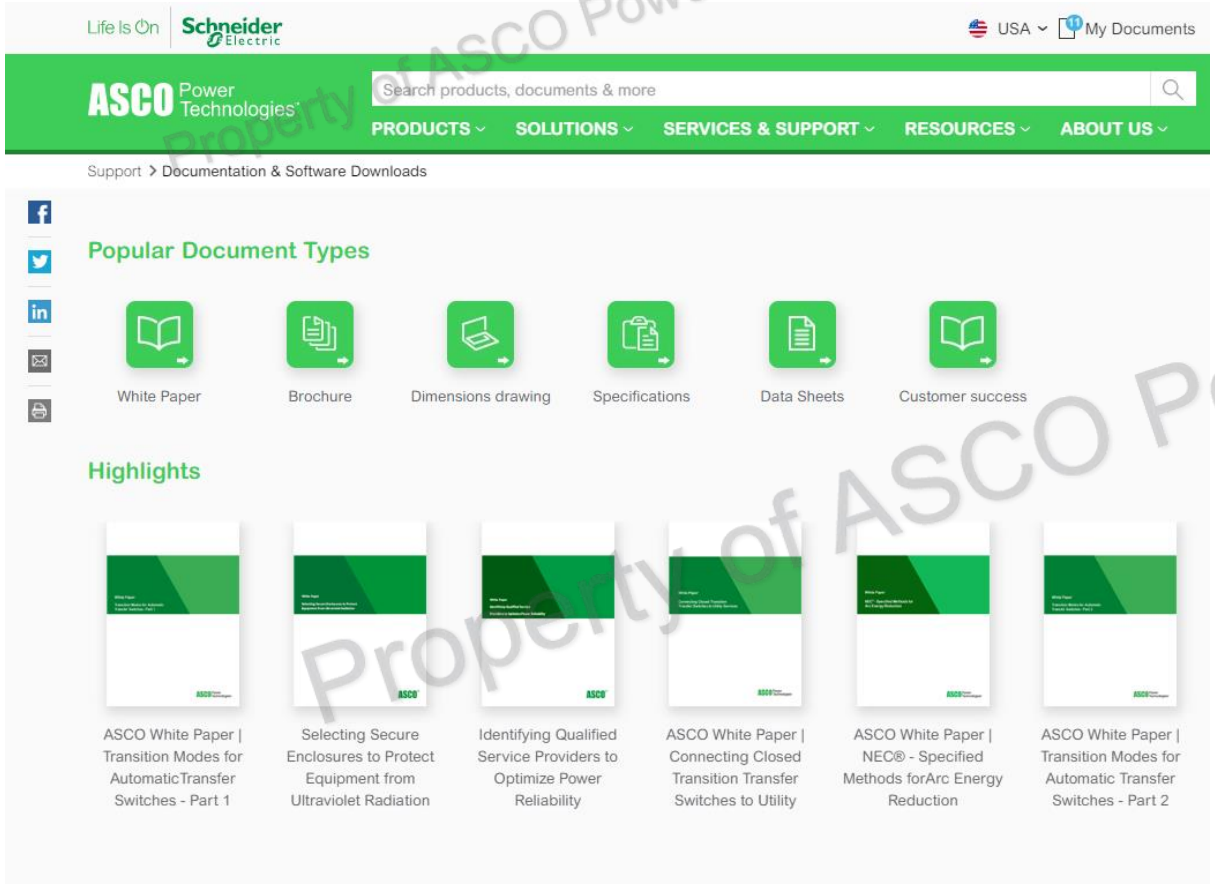
COMPUTER ROOM
AIR CONDITIONERS

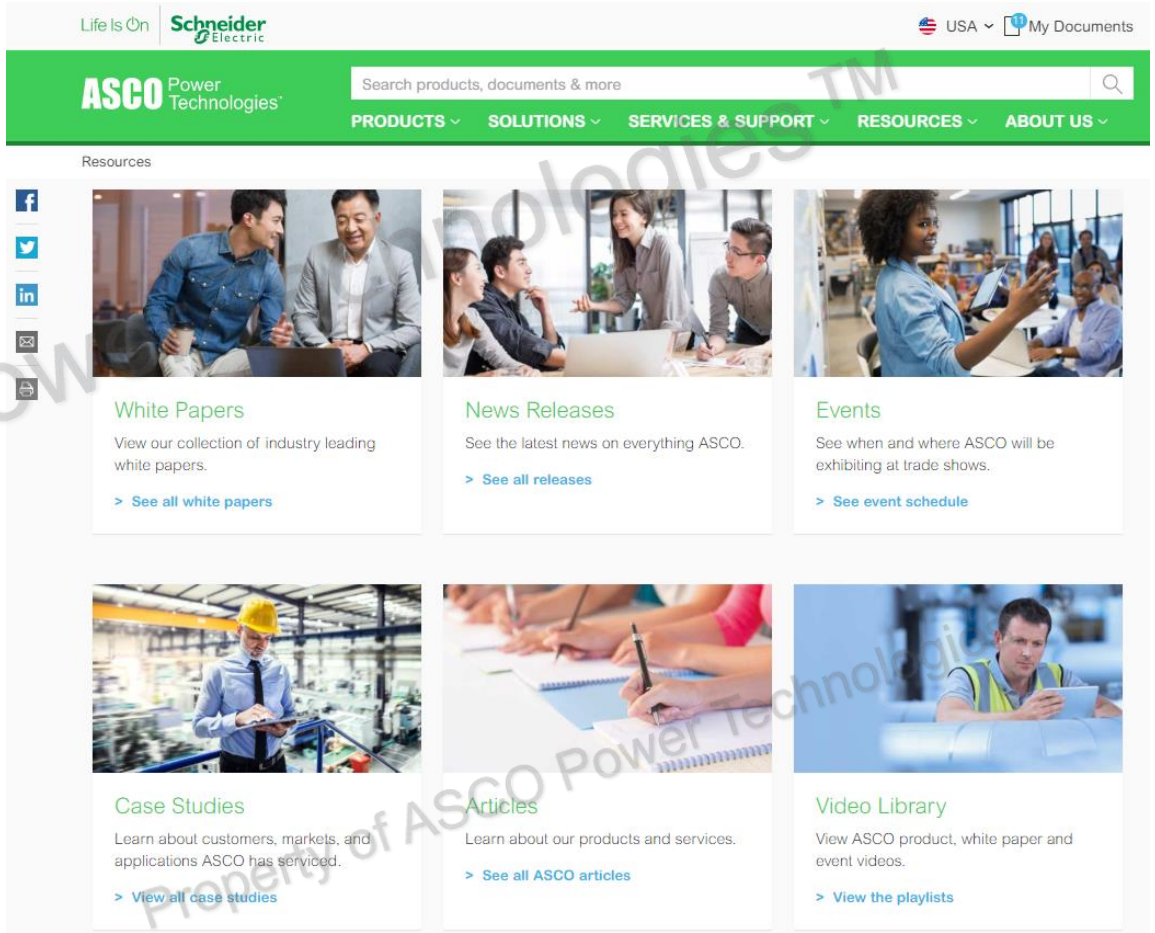
UPS

EPSS

Documentation

www.ascopower.com





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