PC-Based Simulators allow personnel to train on switchgear operation without ever interfering with the actual power control system... thus preventing disruption to your business!

Switchgear Simulators

- Highly sophisticated tools that are custom-built to replicate the on-site system automation and graphics
- Invaluable tools for training operators how to respond in a safe manner to various failure scenarios including; utility source, engine generator, and circuit breaker failures as well as other potentially damaging system events

“The Russelectric simulator is a complete game-changer. Within the first five minutes of using the simulator it became clear that it must become the basis for training as well as a mandatory step in the development of Methods of Procedure for taking any action at our critical facilities. The simulator revealed a potentially business-disrupting fault in our operations at a major data center before we even brought it home from Russelectric. It is our new standard.”

Project Engineer, Major Telecom

Operating Real Equipment vs. Training with a Simulator

Since site engineers seldom get the opportunity to operate equipment under live load, training typically consists of reviewing manuals. Russelectric Switchgear Simulators let engineers practice operating virtual equipment, giving them the confidence they need to operate real equipment properly when the time comes.

Develop / Validate Site Operating and Emergency Procedures

- Simulators allow engineers to pretest new Method of Procedure documents, and practice responding to failures
- By allowing personnel to run an almost limitless number of failure scenarios, Russelectric Training Simulators are also a powerful tool for developing and validating site operating and emergency procedures without interfering with the operation of the actual system

Facilitates Future Switchgear Upgrades by Validating Modified PLC Logic Offline

- Whenever the switchgear is upgraded, the simulator can be used to thoroughly test the modified PLC and operator interface panel (OIP) logic before downloading it to the online PLC system, dramatically reducing live system testing time
- Reduce wear on generators and circuit breakers
- Conserve diesel fuel and reduce pollution by limiting engine runtime

Training Simulator Capabilities

<table>
<thead>
<tr>
<th>Capability</th>
<th>Standard</th>
<th>Enhanced</th>
</tr>
</thead>
<tbody>
<tr>
<td>System tests (load test, no-load test, etc.)</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Set point changes</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Generator demand</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Manual and automatic load control</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Utility failure and restoration</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Disabling individual generators</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Rack-in/rack-out circuit breakers</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>External tripping of circuit breakers</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Generator alarm examples</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Disabling circuit breakers (failure to open/close)</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Circuit breaker over current/protective relay trip</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Pre-test system PLC/OIP changes with the simulation</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Simulated load kW specified by operator</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Dedicated PC and PLC simulation hardware</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Metering values for hardwired control door analog meters</td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>Hardwired manual switchgear operation (close interlocks, etc.)</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>Use as an aid in developing maintenance Method of Procedure</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>Front view elevation simulation windows</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>Simulated sounds (breakers, alarms, operating engines, etc.)</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>Number of screens</td>
<td>2</td>
<td>3*</td>
</tr>
</tbody>
</table>

* An optional ultra high-definition monitor can be provided in place of the three touchscreen monitors.
Why use a Simulator?

- Virtual tool that is always available for training on system operation with no risk of an unplanned power outage
- Assess the impact of changes to switchgear set points such as:
  - Adjusting time delay settings between upstream and downstream equipment
  - Changing the Prioritized Load Sequence
  - Adjusting expected kW load values as the seasons change
- Instills greater confidence in operator abilities by allowing them to practice their responses to specific events/scenarios such as:
  - Utility failures
  - Load changes
  - Engine failures
  - Bus faults
  - Breaker failures
  - Utility curtailment
  - Utility transformer replacement
  - UPS in bypass
- Allows site personnel unlimited opportunity to train on the use of virtual hardwired manual switchgear controls to respond to a total system PLC failure
- To familiarize site personnel with OIP operation such as:
  - Switchgear controls
  - Power monitoring capability
  - Event list/historical log data mining (filtering events by group or priority)

Who can use the Simulator?

- Site engineers
- Contractors and commissioning agents
- Authors of Methods of Procedure
- Russelectric field service engineers (to train site personnel or familiarize themselves with the system)

In the Safety and Comfort of an Office Environment

Russelectric Training Simulators allow personnel to train on the automatic (and manual) operation of Russelectric power control systems without interfering with the operation of the actual system...in the safety and comfort of an office environment.

Expand Training and Scenario Evaluation Opportunities Dramatically

- Designed and programmed to mimic the actual operation and performance of the customer’s Russelectric power control system/switchgear. Russelectric Simulators help personnel familiarize themselves with the system and its operation
- Accurately diagnose a wide range of utility, generator, and breaker problems

Watch our videos online: www.russelectric.com/simulators
Training Opportunities: Simulator vs. Live Equipment

<table>
<thead>
<tr>
<th>Available Training Hours (per year)</th>
<th>On Live Equipment</th>
<th>On Russelectric Training Simulator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineer</td>
<td>1-2 Load Tests and No-Load Tests</td>
<td>Unlimited Limitless Tests and Transfer Failure Scenarios</td>
</tr>
<tr>
<td>Senior Engineer</td>
<td>2-4 Load Tests, No-Load Tests, and Maintenance Transfers</td>
<td></td>
</tr>
</tbody>
</table>

Testimonials

“We use our Russelectric Switchgear Simulator in many ways. Every relevant MOP, SOP, EOP, and logic change is validated on the Simulator before being performed live in our data center. We assign Simulator training exercises every month. This has raised the team’s level and has led to some great discussions. The Simulator also allows us to confidently go off script during maintenance transfers and repair activities, with expected results.”

Data Center Engineer, Insurance Company

“The Russelectric simulators have provided valuable assistance in the startup, commissioning, live cutovers, and training in multiple projects. The design of the simulator allows for testing of the actual system logic without requiring changes to the logic prior to loading the logic in the system PLCs. This feature allows for greater trust of the results of testing the logic or operating the system, facilitates testing of modifications or corrections to the system, and provides an invaluable training aid to the facility operators. This feature is also different from many simulators that we have used which require the programmer to copy various modifications into the system logic in the correct location(s) prior to loading the upgrades modifications.”

Commissioning Agent

Field Service Locations

Markets Served
- Data Centers
- Healthcare
- Telecom
- Banking
- Insurance
- Utilities
- Airports
- Municipalities
- Higher Education
- Water/Wastewater
- Cogeneration
- Renewable Energy
- Microgrids

Products & Services
- Power Control Systems
- Custom SCADA
- Simulators
- Automatic Transfer Switches
- Bypass/Isolation Switches
- DTWG Web Server Communications
- Start-Up Commissioning
- Equipment Enhancement Solutions

Key Capabilities
- Complete In-House Manufacturing Solutions
- Custom Order Engineering
- R&D and Product Design
- Equipment Field Services and Engineering
- Nationwide Emergency Response Available 24/7/365

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