

KOHLER POWER
POWER SYSTEMS • RENTAL SERVICES

CASE STUDY

Application

EQUIPMENT UPGRADES, FULL PROTECTION

For the last 22 years, the Home Shopping Network Inc.'s backup power setup has served HSN very well, even during hurricane season. But as the equipment aged, HSN was spending significantly more time and money on repairs to their switchgear system, and the aging equipment was putting the organization in an increasingly vulnerable position.

Their technical service provider and a Kohler distributor, **Tampa Armature Works** (TAW), has serviced HSN's electrical equipment for several years. They are familiar with the ongoing maintenance needs and track down parts that are becoming more obsolete as time passes. While TAW knows what's necessary to keep the dated switchgear operational, they also understand HSN's operations and risk factors. TAW recommends that the new KOHLER PD-4000 switchgear be engineered to work with HSN's existing 22 year-old diesel gensets, yet be flexible enough to operate with any new electronically controlled generator sets installed in the future.

So HSN calls on Kohler and TAW for the job: replace the dated switchgear with new Kohler gear that will parallel with HSN's eight 1800kW industrial generators installed in the 1980s. While this two-month switchgear changeout takes place, HSN requires a temporary generator package to provide full protection from any utility power failures that could occur during this time. Six megawatts of backup power from four Kohler Rental Power Modules are brought to HSN's main campus to provide this protection during the switchgear changeout, allowing their show to go on, and customers placing and receiving their orders.

"We really needed to minimize our risk and maintenance requirements," said Alastair Odonnell, Facilities Manager at HSN. "At the same time, we needed to weigh a variety of options, and TAW and Kohler really helped us consider every possible scenario and solution."



Customer

HOME SHOPPING NETWORK, INC.

At the Home Shopping Network Inc.'s headquarters in St. Petersburg, Florida, hundreds of **HSNI** employees staff the phones 24 hours a day, seven days a week, collecting customer orders, arranging payments and coordinating shipments. At the same time, the HSN production studios are also live 24/7 with product demonstrations and information that millions of households tune into daily. If the local Florida utility fails, just a few seconds of power loss will cost HSN lost revenue and delayed customer support.

The HSN electrical facility is always standing ready to provide backup power to any and all of its several facilities covering the 67-acre campus. Supported by a room full of UPS, paralleling switchgear and more than 14 megawatts of generator power, and an all-hands-on-deck electrical and mechanical crew, HSN is well prepared to go on should their local utility fail for any reason.

Challenges and Solutions

Rental generator requirements. Before any work starts on the switchgear replacement, rental generators and switchgear are needed for backup power support, and needed to also fit within a tight space. Kohler Rental's **Technical Services and Design team** provides the best solution: KOHLER Power Modules, which packages a 1,500kW generator and KOHLER KRP-250 paralleling switchgear in a single, compact and quiet trailer. **Kohler Rental** rolls in four Power Modules to HSN, carefully crafting the cabling and trailer position so it does not interfere with the permanent installation project. The redundant power system involves KOHLER Power Modules that run in parallel at 480 volts, connected through a step-up

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Challenges and Solutions



transformer and fused disconnect to supply HSNI at the required 4160 volts through the internal distribution system. “While the new KOHLER switchgear installation is coordinated, the Kohler Rental generators were their lifeline over the transition of the project,” said Travis Goodman, Account Manager for Kohler Rental. “The Power Modules are a perfect fit for this application because of the fully integrated switchgear and generators in a single, containerized unit. They are also fully capable of paralleling with some simple communication cabling and standardized settings to control the variable power applications they can be used for.”

Single inter-tie breaker design.

HSNI’s older paralleling system had been designed to operate off just one inter-tie breaker. If that breaker ever blew for any reason at the same time utility power failed, none of the eight generators would be able to start, parallel or distribute power to the facility. “That single point of failure left HSNI too vulnerable, so we redesigned the new system to feature two tie breakers,” said



Stephen McGuire, TAW’s Technical Services Manager. “Should one breaker fail, the new design allows the other breaker to automatically transfer the electrical load to wherever needed on the campus.”

Lack of remote monitoring. During the many visits with HSNI, Kohler learns that the existing System Control and Data Acquisition (SCADA) system didn’t consistently provide reliable and useful information from the generators, and the transfer switch and switchboard operations weren’t always visible throughout the facility. “We discussed with HSNI how a more reliable and efficient SCADA system would serve them much better in the future,” said Dan Krueger, Sr. Field Applications Engineer for Kohler Power Systems. “Together, we designed a system that works with the new KOHLER switchgear. The new SCADA system not only

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THE JOB

- 4 Kohler Rental **Power Modules** (a 1500kW KOHLER generator and KOHLER switchgear in one trailerized unit), paralleled to each other
- 10 custom cabinets of KOHLER **PD-4000 Switchgear** (4160V)
- Kohler custom SCADA system for generators, facility transfer switches and switchboards
- 5250 KVA **transformer** 480V to 4160V
- Kohler and local distributor engineering and support 24/7

Challenges and Solutions

provides detailed and real-time information about their current generators, but also allows HSNI's facility engineers to monitor their eight switchboards and transfer switches, no matter where they are on the campus." Such information is consolidated into one place with the SCADA system, allowing HSNI to



be informed quickly of any problems throughout the facility, including a fault description and detailed location of where the fault is taking place. Added McGuire: "HSNI's maintenance crew is efficient in dispatching service personnel with the right tools. With the new paralleling switchgear and the new SCADA system, HSNI has not only benefitted from a significantly

more reliable and robust emergency backup system, but they are able to respond much quicker to any power system service issues throughout their entire campus."

Crunched for time and space. Taking out the old switchgear, installing the new, and conducting the testing and startup, is a time-consuming process. And the Kohler team had just two seasons to work between: holiday shopping and hurricanes. Any rental and new equipment also needs to fit within the existing space devoted to HSNI's emergency power system. The existing medium-voltage paralleling switchgear was installed within a tight footprint. Because standard design medium-voltage paralleling switchgear won't fit into this existing space, Kohler customizes a 10-cabinet switchgear lineup to fit within the current footprint and also utilizes the existing conduit and power cables.

RESULT

Over several months, the Kohler team works closely to engineer a solution that allows greater design and application flexibility with the new KOHLER switchgear to be installed, while improving system reliability and protection for HSNI. "We carefully scrutinized over every detail for the entire system changeout process. This included not only the custom equipment design, but also the process of quickly removing the old equipment and replacing it with the new," said Krueger.

Kohler Rental designs a redundant backup power system that protects HSNI throughout the entire changeout project, and, keeps HSNI's operations uninterrupted, no matter what happens with the Florida utility. Anytime there was a possible grid glitch that could occur, either due to an impending storm, or if the utility predicted any risk of an outage, HSNI would start the four Kohler Rental 1500 kW gensets onsite and have backup power ready at a moment's notice.

The greatest concern was to reduce — to an absolute minimum — HSNI's exposure to potential downtime during the transition from the existing backup system to the rental equipment, and then back again. With the entire HSNI campus backed up by the Kohler Rental equipment, the new KOHLER paralleling system is able to be completely tested with the existing eight generators prior to switching the campus back from the rental generators. In less than two hours, the changeout takes place, with no interruption to HSNI's operations.

"This process allowed for an extremely high level of confidence in the new system and assured minimal exposure to any issues with this transition," said Odonnell. "In the end, I really thought there might be more challenges with integrating our older generators with the new switchgear, but the strong engineering teams from Kohler and TAW, the intense pre-planning, and anticipating all scenarios really paid off. Even for such a technical challenge as this project was, it was a positive experience all around."