Case Study: Preventing a Data Center Shutdown

How a nationwide bank restored critical cooling without infrastructure changes

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CASE STUDY: PREVENTING A DATA CENTER SHUTDOWN

How a nationwide bank restored critical cooling without infrastructure changes

A nationwide bank's headquarters in Australia supports critical IT infrastructure for banking operations across the continent. Keeping this data center equipment at a functioning temperature contributed to the bank's rising energy costs.

In 2022, a building-wide HVAC refit removed a central chiller to improve the facility's energy efficiency. In its place, individual cooling systems were installed on each floor to regulate temperature independently.

But what no one realized at the time was that the original chiller also cooled the bank's backup generator.

Routine testing gave the bank confidence that its backup generator was storm-ready—until late 2023, when a major storm hit. Power failures forced the generator to run for extended periods, but without the chilled water from the old system, it overheated and shut down, putting the entire banking network at risk.

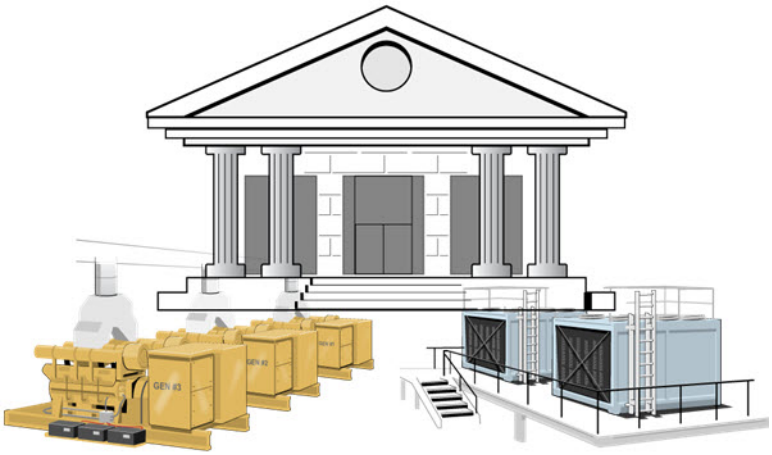
CRITICAL COOLING—BUT NO INFRASTRUCTURE MODIFICATIONS

Fixing the cooling issue wasn't as simple as installing a new system with new sensors and controls.

Strict building regulations prohibited drilling into walls, floors, or ceilings, meaning no new conduit runs between floors. The solution had to work with the building as it was, using only existing cable pathways.

To restore cooling, the bank installed a radiator on the building's roof and repurposed existing copper piping to circulate coolant. A three-phase fan pulled air across the radiator, dissipating heat before the coolant returned to the generator, creating a closed-loop cooling system.

But the bank wanted better monitoring and control than ever before. Restoring cooling wasn't enough—the new system had to provide real-time diagnostics, alerts, and automation to make sure the problem never happened again.



The rooftop radiator of the bank's headquarters

BRINGING THE RIGHT PARTNERS TOGETHER

For over 20 years, ProSwitched™ has provided electrical and process control expertise for the nationwide bank. When the bank's on-site electricians needed a smarter monitoring and automation solution to keep their generator online, they relied on their long-time partner for support.

To enhance industrial automation and IIoT capabilities, ProSwitched turned to Binford Tech™, an Australian industrial controls distributor, to supply the necessary hardware and technical expertise.

To keep the generator online they needed to develop an automated solution that integrated seamlessly with existing infrastructure—requiring no structural modifications and using existing cable pathways.

SMART SENSORS NEED SMART CONTROL

Early on, Binford Tech and ProSwitched identified IO-Link® as a way to simplify installation and enhance diagnostics without adding new wiring. They selected SICK® IO-Link sensors to provide real-time monitoring of key parameters:

- FTS-I100F14B thermal flow/temperature sensors to monitor coolant flow and temperature.
- PBS2-RB010SG1SSDNMA0Z pressure sensors to track system pressure and detect anomalies.

These sensors digitally transmit their data over a single cable, making installation easier within the existing infrastructure. To manage the IO-Link devices, the IFM® AL1122 and AL1120 IO-Link masters were deployed, enabling seamless Ethernet/IP communication to the control system.

But sensors and IO-Link masters weren't enough—the system needed a controller that could integrate everything

***groov* EPIC handles central control from the generator room.**

***groov* RIO EMU tracks power conditions to ensure stable generator operation.**

over Ethernet, providing real-time data processing and automation to keep the generator running reliably.

That's where the Opto 22 *groov* EPIC® came in. More than just a PLC, the *groov* EPIC (**E**dge **P**rogrammable **I**ndustrial **C**ontroller) combines real-time control with built-in networking, data processing, and secure access. It also includes *groov* View® for built-in, web-based, and local visualization that allows operators to monitor and adjust the system from any connected device.

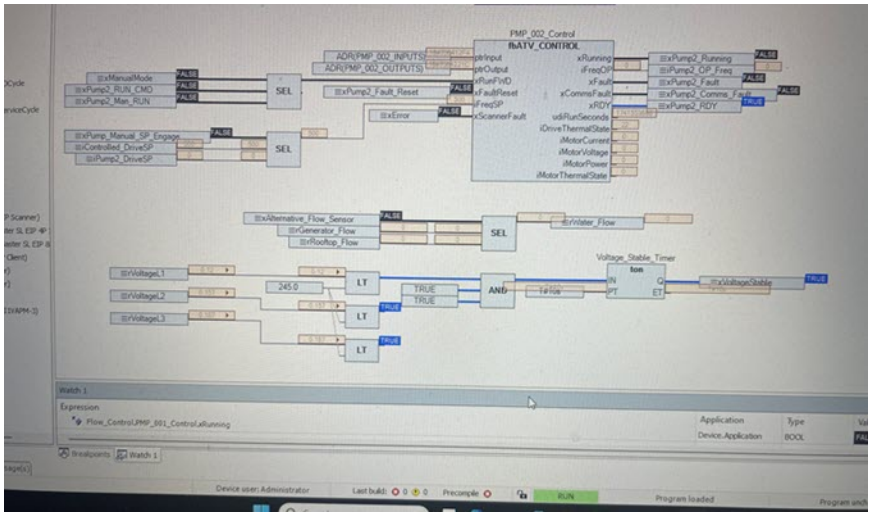
To further enhance monitoring, a *groov* RIO® Energy Monitoring Unit (EMU) was installed to track voltage, current, and power conditions, ensuring stable operation and helping detect fluctuations that could impact generator performance.

With direct Ethernet integration to *groov* EPIC, the *groov* RIO EMU provided real-time energy data with simple software configuration and no complex wiring.

CODESYS CONTROL ENGINE

For the bank's application, Binford Tech and ProSwitched used CODESYS®, a PLC programming environment and runtime that allows for flexible IEC 61131-3-compliant programming. Each *groov* EPIC includes a free CODESYS

The bank's master generator room



The nationwide bank uses the CODESYS development platform for real-time control.

runtime license, enabling advanced communications and control logic without any added cost.

The team used several CODESYS capabilities:

- **IEC61131-3 program logic**—monitoring and controlling equipment in real time
- **Modbus®/TCP communication to Variable Speed Drives (VSDs)**—controlling cooling system pumps and fan speeds
- **Ethernet/IP communication to IO-Link master devices**—integrating with smart sensors for real-time monitoring
- **OPC UA® server for communication to *groov* View**—allowing visualization for operators to monitor system performance and adjust setpoints

"*groov* EPIC's ability to talk to so many devices at once made this project possible. It gave us better control, better monitoring, and way more insight than we've ever had before," says Justin Anderson, Industrial Electrician with ProSwitched.

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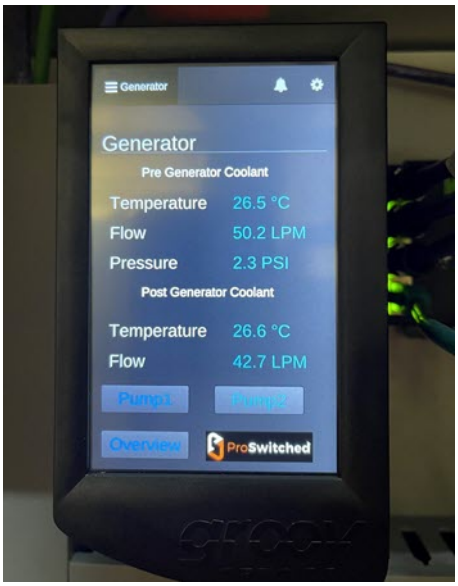
- Justin Anderson, ProSwitched

groov VIEW FOR VISUALS AND ALERTS

Every *groov* EPIC includes a web-based visualization platform called *groov* View, which runs both on the *groov* EPIC's LCD display and on any network-connected devices. The bank's application used *groov* View for the following features:

- **Monitoring**—to display real-time data from temperature, pressure, and flow sensors



A *groov* View HMI page shown on the EPIC's built-in touchscreen

- **Adjustments**—to let operators modify setpoints and control parameters remotely
- **Alerts**—to send email notifications when generator cooling thresholds are exceeded
- **Troubleshooting**—to provide historical trends and diagnostic data to identify potential issues

"*groov* View gave us exactly what we needed—local monitoring, on-site control, and automated alerts—all without adding extra HMI or display hardware," says Anderson.

RESULTS: A STORM-PROOF SOLUTION

At the end of 2024, the bank's backup generator faced its ultimate test—an entire storm season with multiple outages—and passed without a single failure or shutdown. What was once a critical vulnerability is now a self-regulating system that keeps power stable no matter the conditions.

Real-time monitoring ensures that if a pump slows or a fan underperforms, the system responds instantly—no manual intervention required.

What was once a last-minute scramble during power failures is now a fully automated, hands-off system. No drilling, no costly infrastructure changes—just a smarter, more resilient solution that keeps the critical servers running when it matters most.

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- Justin Anderson, ProSwitched

FUTURE PROSPECTS

With a full storm season behind them and zero failures, the bank and its partners are now looking to enhance the system further.

The next step is remote monitoring via the secure OpenVPN® client included on all *groov* EPIC processors, allowing operators to check performance and troubleshoot issues without needing to be on site.

They are also exploring direct generator integration, using *groov* EPIC's myriad communication options to pull

Rooftop views: new radiator pipes connected to existing copper pipes

Generator monitoring page in *groov* View

real-time data on fuel levels, runtime, and system health to provide deeper insights and faster response times if issues arise.

With Binford Tech and ProSwitched's modular approach and *groov* EPIC's flexibility, the bank can continue scaling without major infrastructure changes, making future upgrades seamless and cost-effective.

Reflecting on the transformation, Anderson sums it up: "Before this, we had no diagnostics, no feedback—just hoping things worked. Now, with real-time monitoring and automation, we know the generator will stay online when it matters most. It's not just a fix, it's a future-proof solution."

ABOUT PROSWITCHED

Headquartered in Bundaberg, Australia, ProSwitched outdoes their competition because of the well-trained and experienced electrician at the helm. They have a vast range of experience in the domestic, commercial, and industrial sectors. They offer their clients exceptional services using the highest quality products. Expert knowledge of electrical installations and maintenance strategies allow them to deliver the best possible solutions to meet all requirements.

ABOUT BINFORD TECH

Headquartered in Australia, solution-based company Binford Tech excels in turning the intricate challenges faced by the fast-moving consumer goods (FMCGs), OEMs, and Process Automation sectors into opportunities for innovation and growth. With over two decades of IoT and Smart Manufacturing expertise, they lead the charge towards more efficient, sustainable industry practices. They are committed to solving complex problems and empowering clients with tailored, cutting-edge solutions.

ABOUT OPTO 22

Opto 22 was started in 1974 by a co-inventor of the solid-state relay (SSR), who discovered a way to make SSRs more reliable.

Opto 22 has consistently built products on open standards rather than on proprietary technologies. The company developed the red-white-yellow-black color-coding system for input/output (I/O) modules and the open Optomux® protocol, and pioneered Ethernet-based I/O.

Famous worldwide for its reliable industrial I/O, the company in 2018 introduced *groov* EPIC® (edge programmable industrial controller). EPIC has an open-source Linux® OS and provides connectivity to PLCs, software, and online services, plus data handling and visualization, in addition to real-time control.

groov RIO Ethernet-based edge I/O modules, introduced in 2020, include I/O and IIoT software in a compact industrial package that goes anywhere.

All Opto 22 products are manufactured and supported in the U.S.A. Most solid-state SSRs and I/O modules are guaranteed for life.

MADE IN THE USA

The company is especially trusted for its continuing policy of providing free product support, free online training, and free pre-sales engineering assistance.

For more information, visit opto22.com or contact **Opto 22 Pre-Sales Engineering**:

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