



S&C Switchgear Adapts to Tight Space Constraints

S&C Featured Solution: System VI™ Switchgear

Location: Toronto, Canada

Customer Challenge

Enwave Energy Corporation is a North American district energy services provider. Enwave uses its Deep Lake Water Cooling system to channel the cold temperature at the bottom of Lake Ontario to provide air conditioning to more than 85 buildings in Toronto and to 40 million square-feet of downtown real estate. This form of sustainable energy is environmentally friendly and displaces 55 MW of power consumption within Toronto's electricity grid annually.

Enwave's client, the owner of Bay Adelaide Centre West, a 51-story tower, was considering an expansion of its electrical room to accommodate Enwave's load requirements but had reached its capacity to add new equipment. Located in the heart of Toronto's densely populated financial district, the tower's electrical room would be prohibitively expensive to renovate or modify. Enwave's equipment, which includes pumps to push chilled water around and other various controls and computers, could not be sourced from the building's existing power supply based on the energy provider's business model. Enwave had to source its own power, which was why Bay Adelaide Centre was considering an expansion to accommodate the new equipment.

The electrical room, located on the fourth floor of the Bay Adelaide Centre, hosts the existing power supply equipment. The building had a 30-MW capacity but routinely used approximately 20 MW. On hot summer days when air conditioning was needed, the building

would typically use up to 26 MW of power. By using Enwave's services, which needed a maximum of 7.5 MW, the building's energy usage would drop to 13 MW.

Generally, space limitations are an obstacle when upgrading existing switchgear in any building. Enwave had been using conventional gear in previous sites, but modern buildings posed a challenge because they are increasingly purpose-built, so they have little available space to accommodate equipment not planned for at the time of construction.

Ultimately, Enwave was seeking electrical equipment that could support 7.5 MW of power usage, be transported, and be placed into the tower's existing electrical room without requiring any major changes to the existing structure. Enwave also required all solutions to be as safe as possible for the maintenance crew operating the equipment.

“The System VI Switchgear enabled us to transport and fit a power system within a confined area, without having to make any structural modifications. Because of our great experience collaborating with S&C, we are now working with them on five other Enwave projects.”

—Marcin Sliz,
Project Manager,
Plan Group

The System VI Switchgear enabled Enwave to expand its service territory to other nearby buildings.



S&C Solution

S&C worked with Enwave previously, in 1995 and 2004, on expansions to its electrical system. Plan Group, Enwave's electrical contractor, also had worked with S&C previously and approached S&C about solving the spacing problem its client was having with use of conventional metal-enclosed switchgear. After reviewing the site with S&C, Plan Group suggested a location within the existing electrical room to accommodate new switchgear, but the space had a height restriction of 86 inches (218 cm) because of a protruding pipe. See Figure 1.

Figure 1. A close-up of the System VI Switchgear installation, where a pipe restricted the equipment height to 86 inches (218 cm).



S&C proposed a solution that would accommodate the height restriction and be lightweight with a small footprint.

S&C invited Enwave to its Toronto plant to demonstrate the features, functions, and benefits of the proposed solution: System VI Switchgear. S&C also introduced Enwave's representatives to other S&C customers to assure Enwave of the System VI Switchgear's reliability.

Enwave was particularly impressed by the System VI Switchgear's low maintenance requirements, operator safety provisions, and the little effect it would have on building operations when transporting, installing, and programming the equipment. S&C also supported Enwave with its knowledge of both the connecting utility's requirements and the Canadian Electrical Code requirements to design switchgear that met all its needs and that would be accepted by the connecting utility.

Figure 2. The completed System VI Switchgear installation in the constrained location.



During the installation, S&C's Power Systems Solutions team programmed the relays, and the company's sales team provided training for the contractors about programming the switchgear's overcurrent control.

Results

Enwave was pleased with the System VI Switchgear installation. See Figure 2. S&C shipped the System VI Switchgear to the site, where it was easily transported through a freight elevator into the electrical room without requiring any structural modifications to the building. Enwave was pleased because removing the glass cladding or inner walls would have been expensive.

The System VI Switchgear met the customer's required features for safer operation, such as a dead-front design, ensuring there weren't any exposed live electrical components. Enwave was also impressed with the switchgear's sealed tank design, which allows it to be installed in places where water, steam, or oil are present.

The new switchgear is helping the energy services provider expand its service territory. This building site now functions as a central boosting station. Enwave's pipes, which carry chilled water for numerous buildings, extend from this central location. This site also allowed Enwave to expand its service territory to other nearby buildings.

Enwave has placed orders with S&C for five other sites for switchgear and other equipment.