Each week, six teenagers gather around a conference table with employees of Thunder Bay Hydro and talk shop. Although they are only in high school, the students are partners on an important project that will keep their city powered up.

The students, who go to Hammarskjold High School in Thunder Bay, Ontario, are applying the networking skills they have learned at the school’s Cisco Networking Academy Program to the real-world. They’re developing a fibre-optic substation automation management system for locally owned Thunder Bay Hydro, allowing the utility’s 17 electrical substations to be monitored and controlled remotely via the Internet.

Jim Loppacher, P.Eng., Senior Manager of Power Systems at Thunder Bay Hydro calls the partnership the ultimate matching of education and industry. “These young minds are a valuable resource,” he adds “They are working on our systems, on a real project, and helping us accomplish real goals.”

Hammarskjold High School partners with Cisco Systems, the worldwide leader in networking for the Internet, to offer the Cisco Networking Academy Program, a four-semester curriculum that provides students with a foundation in networking and information technology fundamentals. The program, which is offered at more than 250 schools in Canada, teaches students how to design, build and maintain computer networks. Students learn the skills needed to prepare them for the world of networking, positioning them for immediate openings in a talent-hungry job market or for engineering-and science-focused post-secondary studies.

The partnership was spawned in March 2001 following a meeting between Hammarskjold’s Vice Principal Wally Golab, Chair of Technical Studies Aimo Viik and Hydro’s General Manager Larry Hebert, who saw an opportunity in their midst. Thunder Bay Hydro needed to develop a system that would allow remote access to its generation stations, but its information systems (IS) team was already stretched and didn’t have the time or resources to devote to the project. The school, in turn, was searching for a challenging venture its Networking Academy students could sink their teeth into – and a true partnership was born.

“We’re always looking for interesting opportunities for our students,” says Aimo Viik, the school’s Chair of Technical Studies and Networking Academy instructor. “Working with a real-world company keeps their skills current and provides them with valuable experience.”

The substation automation management system will enable Thunder Bay Hydro to detect faults on 1,500 kilometers of overhead and underground power lines. Rather than having crews visit a troubled site and manually fix the problem through hand wiring, the automated system will instantly detect where a
failure has occurred and what the problem is, so crews can make the necessary adjustments remotely. All work will be conducted over the Internet, saving the utility time and money, while dramatically improving power service to Thunder Bay Hydro’s 48,000 residential, commercial and industrial customers.

The six students – one in Grade 11 and five in Grade 12 – have gained a tremendous amount of networking experience through the Networking Academy Program in a few short months, making them qualified to delve into such an important project. The program combines online learning and testing with instructor-lead training and hands-on laboratory exercises, in which students apply what they learn in class by working on actual networks. The innovative e-learning approach allows students to proceed through lessons at their own pace and use visual explanations of technology.

“We didn’t look at the students’ age or grade level when we hired them,” says Scott Wright, Engineering Computer Application Specialist at Thunder Bay Hydro and the students’ supervisor. “They’re going through a certified course, they’re familiar with the equipment, and that’s all that mattered. These students really impressed us. In fact, they had the Web server up and running within a couple of hours – when I was in university that took some people a whole day.”

Each of the six students is responsible for a specific task, such as setting up the operating system, configuring the relays, setting up the Linux Web server, or designing the Web site. They spend three hours a week in class working out the kinks, then head over to Thunder Bay Hydro’s corporate office once a week to update the in-house IS team on their progress.

“The Hydro team is extremely friendly and helpful,” says David Valente, 18. “They keep us completely involved, they explain to us what they would like to see, and they’re always there if we need a helping hand or need something checked.”

The students say they get a thrill working on something that will affect their whole community. In fact, they often consult each other in the hallway between classes and most spend much of their free time exploring new avenues.

“It’s pretty amazing working with real engineers and learning how the city’s power system works and how electricity is delivered to your house,” says Brian Jones, 17.

“It feels like I have a really big responsibility. It’s really meaningful,” adds Valente. “It will have a huge impact on what happens in the city and how Hydro will operate in the future. We’ll be able to say that we started the whole process.”

Thunder Bay Hydro has been extremely impressed with the students’ networking knowledge thus far. By the end of June 2001, students had completed the work on one of the hydro substations. The project is taking a break for the summer and will resume in September 2001 at the start of the new school year.

“These kids are really keen,” says Thunder Bay Hydro’s Jim Loppacher. “They’re go-getters. And they’re interesting to have around. To be quite honest, it keeps our guys on their toes. They’re just eating this stuff up.”

All agree that without the Cisco Networking Academy Program the entire project would not have been possible.

“The Networking Academy Program taught us how to configure the routers, wire them, how to troubleshoot when we run into problems, and how to make sure the protocols are set up correctly,” says Valente, who plans to study computer science at Lakehead University in Thunder Bay upon graduation. “This project has been a really good learning experience all around. We’re building on what we’ve learned in class, and gaining experience we will need in the future.”