Powering Up for the

The University of Utah upgrades its distribution system for the 2002 event.

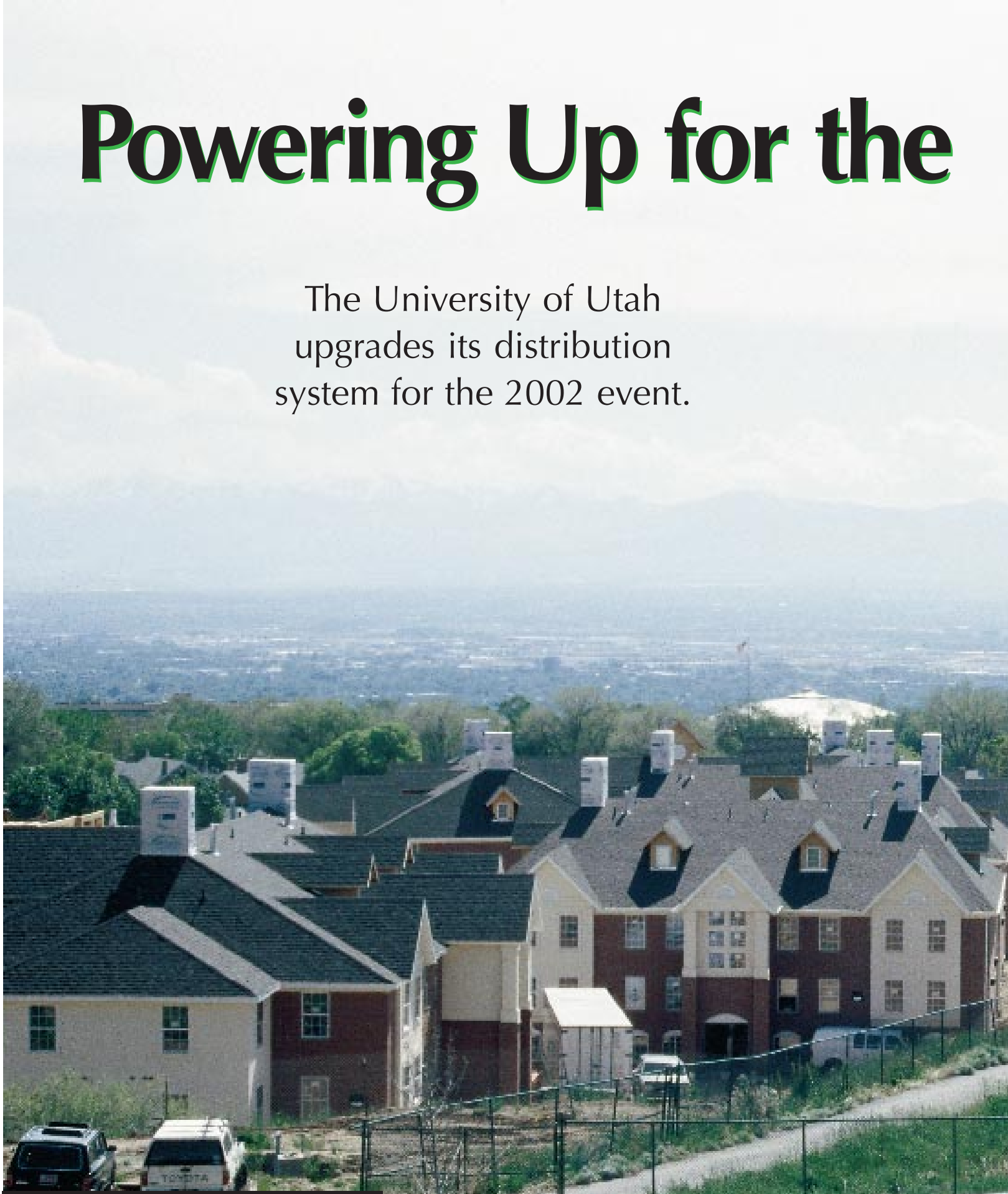

Fig. 1. New village housing under construction.

Winter Olympics

By Richard Kiel, University of Utah

Salt Lake City, Utah, U.S., host site of the 2002 Winter Olympic Games, is preparing for this highly visible, worldwide event with construction projects necessary for providing housing for athletes and accommodations for spectators. The University of Utah has been selected as the locality for the opening ceremonies and Olympic Village housing. Founded in 1847, the university specializes in medical research, law, engineering and business. It has a student body of approximately 20,000.

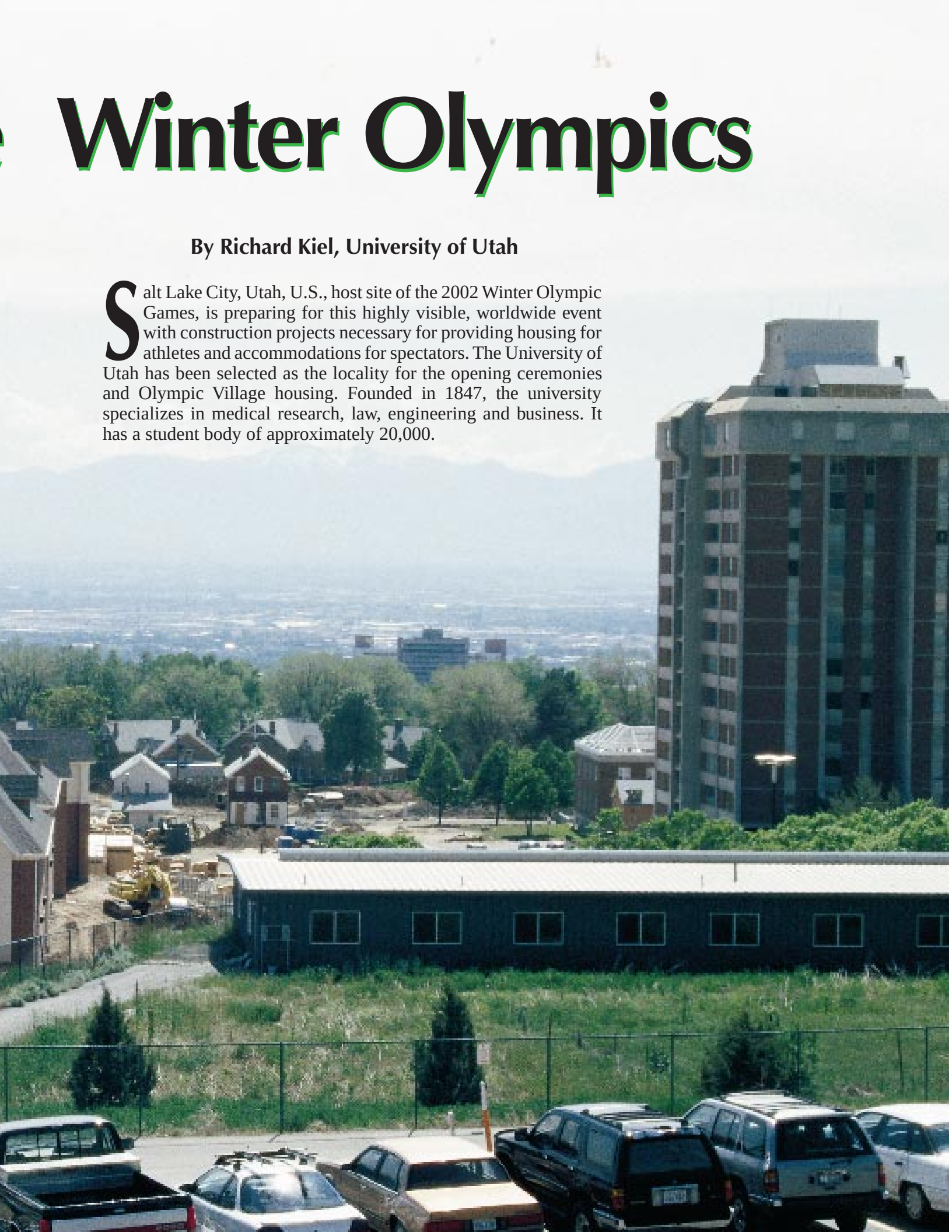

Fig. 2. Rice Stadium under construction.

Fig. 3. Completed expansion of the stadium.

A focal point of new construction at the University of Utah is the recently completed expansion of Rice Stadium from 35,000 to 45,000 seats (Figs. 2 and 3). The second major project is the construction of housing adjacent to the present campus towers (Fig. 1). To provide transportation for athletes, the university will fabricate a new rail system, which will extend from the campus to the Olympic competitive areas. A new substation (Fig. 4) has been added to the two that already exist on the campus to accommodate the expected increase in load. This new substation also will serve a newly added cancer research laboratory.

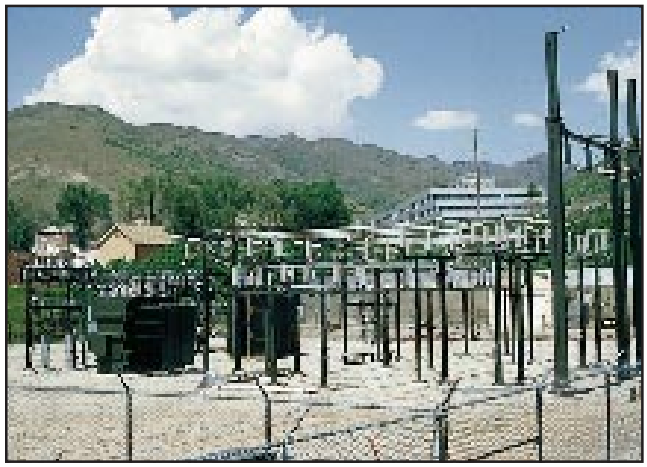

Fig. 4. The new substation.

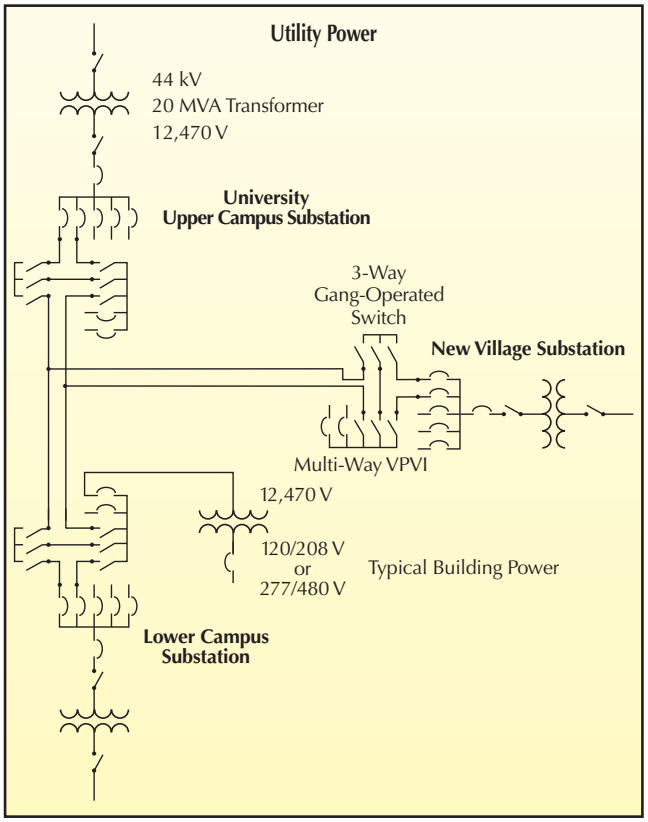

Fig. 5. System diagram showing dual redundant loop circuits.

The Distribution System

The new substation, rated at 20 MVA, is fed at 44 kV and provides primary service with a 12.47-kV wye system. The new facility has the same capacity as the other two substations located at opposite ends of the campus. To ensure a high degree of reliability, the distribution system is designed as a redundant loop system that uses multiway-load and fault-interrupting switchgear, each with the capability of being serviced by two separate substation feeders (Fig. 5). The system not only maximizes service continuity, but also minimizes downtime while maintenance is being performed during the event of an outage or other power problem.

Fig. 6. Pad-mounted switch (G&W Electric Co.) incorporating two source feeders and two vacuum interrupter protected taps.

Fig. 7. Disconnectable splice permits cable runs to be energized before connecting to switchgear.

Unique Cable Connection System.

Switchgear, supplied by G&W Electric Co., Blue Island, Illinois, U.S., is installed on an outdoor pad (Fig. 6), or in building or underground vaults. In anticipation of future load growth, new switches have multiway configurations with dedicated switched ways for future cable runs. An exclusive disconnectable bushing/cable-splicing system, also

Fig. 8. Cable ends bolt to mating switchgear entrance bushings.

supplied by G&W Electric Co., is used to provide flexibility in construction. In the case of vault installation, the disconnectable system permits new vaults to be constructed and all cable trained and energized before switchgear placement occurs. The main campus runs use paper-insulated, lead-covered (PILC) cable, and the tap circuits to building sites use extruded ethylene propylene rubber (EPR) dielectric cable. The versatile splice design permits the cable ends to be dead-ended and bolted together to energize the circuit before distribution equipment is installed in the vault (Fig. 7). This splicing system is capable of joining dissimilar cable types, such as PILC and EPR, with a high degree of reliability. When the new switchgear is ready for installation, the cable splicing system is easily disconnected, leaving two already terminated cable ends that can then be bolted to a mating bushing on the switch (Fig. 8). This procedure simplifies switch installation, reduces downtime and permits an easy means of disconnecting a cable run if maintenance or replacement is required.

Instead of using fuses, present practice provides for overcurrent protection of the three-phase transformers installed at new building locations where the loadbreak switchgear incorporates integral vacuum interrupters. The interrupters are resettable, which eliminates the necessity for maintaining an inventory of fuses. ■

Richard Kiel has worked at the University of Utah since 1975. Kiel served an electric industry apprenticeship until 1981, when he attained the level of journeyman electrician. He worked on high-voltage services and became Substation Distribution and Maintenance Specialist in 1992. In 1998, Kiel became the primary distribution specialist and assistant supervisor for the Plant Operations Electric Department. Currently, Kiel is working on electrical systems at the university in preparation for the 2002 Olympic Games.