

# Commonwealth Edison Madison and Ohio Substation Projects Improve Chicago's System

The Madison and Ohio substations projects are representative of the seven-year commitment Commonwealth Edison (ComEd), an Exelon company, is making to improve the transmission and distribution system in the city of Chicago.

In the summer of 1999, after numerous outages and equipment failures in downtown Chicago, ComEd began a detailed system evaluation. In January 2001 the company issued "The Chicago Optimization Plan to the City," a comprehensive program to overhaul the utility's T&D system to accommodate future growth in energy consumption in the congested urban setting. The plan details a series of new installations and upgrades to existing substations, a 138-kV looped system in the Chicago Loop and north side, and a number of distribution feeders with keen sensitivity to the urban surroundings. Longer-term projects were also identified conceptually in the 2001 through 2007 plan. Phase one included an expansion of the Kingsbury substation, awarded in July 2000 and energized in June 2001 and a new State Street substation, awarded in March 2001 and put into service in June 2002.

Two of the current improvements that are nearing completion are the Madison and Ohio substations projects. Engineering on both projects began in August 2002. Construction commenced on the Madison Substation project in June 2003, entailing a 138-kV GIS eight-breaker ring bus with four 30/40/50 MVA and 132/13.2-kV air-cooled transformers. The project will be completed in November 2004.

Construction improvements on the Ohio Substation began in April 2003, calling for 138-kV GIS nine breaker addition/uprate of an existing station from 69-kV to 138-kV service and the addition of four 30/40/50 MVA, 132/13.2-kV air-cooled transformers. The system will be energized in October 2004.

As with the first two substations, (Kingsbury and State Street), the current two projects are being completed under a contractor-of-choice (COC) agreement between ComEd and Kenny Construction Co. (Wheeling, Illinois, U.S.). The Kenny COC Alliance Team also includes M.J. Electric, Inc. (Iron Mountain, Michigan, U.S.) and Sargent & Lundy LLC (Chicago, Illinois, U.S.). Kenny Construction is the general contractor and has responsibility for the civil/structural construction and the overall program management. M.J. Electric is responsible for the electrical installation work. Sargent & Lundy performs all engineering, con-



ComEd's "Chicago Optimization Plan to the City" include the construction of the Madison Substation which is underway in downtown Chicago.

struction quality management and commissioning. ComEd is also an integral member of the project team providing input regarding design requirements for transmission and distribution interconnections, protective relaying, controls, and operating procedures.

As with the earlier improvement, project limitations on building sizes, structures that blend with surrounding neighborhoods and landscaping to meet city and local community requirements were a challenge.

One of the project management tools being deployed by ComEd on these projects is a procedure for successive project review called the Challenge Process. Kenny Alliance Team is subject to in-depth scrutiny on the proposed design, schedule, and budget with "lessons learned" incorporated into each next phase going forward.

The Challenge Process has been successful in cost-savings changes, for example in modification of the design configuration from a high-rise layout to a lower profile enclosure for the GIS building, which is more compact and will minimize the need for forced-air cooling. of the equipment. Other efficiencies have been gained by having the same team work on consecutive projects. ComEd and consumers are realizing noticeable increases in load capacity and system reliability as a result of the projects completed to date, due to the system reliability program for the city.