System Accomplished focuses on unique design or installation problems and how they were solved. If you have solved a difficult installation problem, we want to hear about it. Email smasia@solartoday.org.

Do-it-Yourself Pays Off for UPS

United Parcel Service has been putting photovoltaic (PV) arrays on selected facilities since 2004, and recently engineered 1.2-megawatt (MW) arrays on two very large buildings in New Jersey. The Parsippany building has 250,000 square feet (23,225 square meters) of roof, and the Secaucus project has 320,000 square feet (29,729 square meters).

UPS chose to finance, engineer and build the projects in-house. "PPA is a great product, but these are durable properties and direct ownership makes more sense for us," said Bill Moir, energy program manager in the UPS Corporate Sustainability Group, based in Atlanta. Part of the reason: UPS facilities are most active at night, so it makes more financial sense to net-meter straight back to the grid both for time-of-use credit and for solar renewable energy credits.

The team chose Suniva 255-watt modules, manufactured in Georgia, and a Schneider GT500-480 inverter for each system. To minimize construction costs, the team optimized string layout, using Shoals combiner boxes and prefabricated wiring harnesses.

Each roof is a corrugated steel deck with two inches of foam insulation and a 45-mil synthetic rubber membrane, sloping a quarter-inch per foot. The Parsippany roof was 18 years old, and inspectors predicted that with regular maintenance it was good for another 10. In addition, the roof already accommodated a variety of HVAC equipment. The need for maintenance dictated the choice of racking: racking manufacturer Silverback engineered a Direct Connect structure with 16 degrees of tilt and 42 inches (1 meter) of working clearance beneath each module. Once permits were in place, a crew of 15 completed installation in about 14 weeks. "It was a standard construction-management job," Moir said.

The Secaucus roof is only three years old, and the cost-effective solution was a PanelClaw ballasted racking system. Design was complicated by tight spacing for the inverters, handled by building special equipment platforms. Then construction was interrupted in November by Hurricane Sandy. "We had about a week to clear all the equipment off the roof in advance of the storm, then lost two weeks restoring power to other facilities," Moir said. Elapsed time from start to commissioning: four months.

By doing all the work in-house, UPS brought the project in well below market installation costs. "If I were to do it again at today's module prices, installed cost would be between $1.95 and $2.15 per watt," Moir said. —SETH MASIA

SILVERBACK

For the Parsippany facility, Silverback engineered a racking structure with 16 degrees of tilt and plenty of working clearance beneath to allow for maintenance on the 18-year-old roof membrane.

UPS PHOTO COURTESY BILL MOIR

The Secaucus roof, only three years old, got PanelClaw ballasted racking.