



Composite Utility Poles Help Expand Power Grid

AS UTILITIES SEEK to replace aging transmission and distribution poles and keep pace with new residential and commercial developments, some are turning to a potentially longer-lasting pole that also requires less maintenance. Composite poles, manufactured from fiber-reinforced polymers and polyurethane resins, are lighter and easier to transport than steel, concrete, or wooden poles. They are also more resistant to wildlife and, when treated with fire retardants, to fires than are wooden poles. And because the inspection, maintenance, and replacement of power poles represent significant costs for cash-strapped utilities, the higher initial costs of some composite poles can be more than offset by their durability in certain applications.

Scott Smith, the manager of apparatus engineering for Southern California Edison, of Rosemead, California, says his utility has deployed composite poles instead of wooden ones to support lines carrying 34,500 V or less, the voltage typically required for residential areas, in locations where wooden poles have unusually short service lives. "One of the places we use them is in the foothills, where we have a woodpecker problem," Smith says. "Woodpeckers can destroy a wood pole in just six months." Southern California Edison also uses the new poles in areas where termites are a problem; woodpeckers and termites generally cannot damage composite poles,

As utilities seek longer-lasting transmission and distribution poles that can withstand wind, fire, and pests, they are increasingly turning to poles made of polymer composites.

Smith says. And because the poles are resistant to moisture, they are also useful in Southern California's coastal environment, he adds. What is more, composite poles coated with a fire retardant are more likely to survive the region's infamous brush fire season than are wood poles, Smith says.

Michael Tenace, the technical director of RS Technologies, a manufacturer of resin poles based in Calgary, Alberta, says that his firm's staff of civil engineers designed the poles, which are manufactured in modules of standard size that can be configured to build poles ranging in length from 30 to 120 ft (9 to 30.5 m) and in diameter from 1 to 4 ft (0.3 to 1.2 m). Although the firm's civil engineers can also assist utilities in designing soil amendments to help keep the poles in place in locations where the ground is less than suitable, most installations require no such intervention, he says. "There are no foundations necessary," says Tenace, who adds that "since it's a lighter structure than steel, wood, or concrete, you can often simply bore a hole, drop it in, and backfill."

Smith says that because the poles are lighter than those made with other materials, they are ideal for use in national forests, where the most environmentally benign method of delivery is by helicopter. Glen Barefoot, the corporate marketing manager for Strongwell, a firm based in Bristol, Virginia, that sells poles made of fiber-reinforced polymer, says that his company's 55 to 80 ft (16.7 to 24.4 m) long one-piece poles weigh just a 10th as much as comparably sized concrete poles. Don Williams, the chief executive officer for Duratel, a Chicago-based firm that makes pultruded composite poles, says that a standard 40 ft (12 m) tall wood utility pole with a bearing capacity of 2,400 lb (1,100 kg) typically weighs 1,100 lb (500 kg), whereas a composite pole of the same size and capacity made by his firm weighs just 305 lb (138 kg).

Composite poles are also more likely to bend than to break in very strong winds, making them preferable to poles of wood or concrete in tornado- and hurricane-prone regions or under ice loads, according to the manufacturers. "Wood breaks at eighty-plus miles an hour," whereas Duratel's poles can withstand wind up to 150 mph (240 km/h), Williams says.

Some of the poles are sold in sections, making them easier to transport on smaller vehicles than would be the case with full-sized poles. Smith says his utility has opted for RS Technologies' tapered pole sections, which can be nested inside one another, for use in residential backyards. "It's hard to get poles into a backyard," he says, and the labor costs of doing so are high.

Because their initial costs can be 2 to 20 times as much as those of poles made from more traditional materials, composite poles are unlikely to replace all other types anytime soon. But Smith says, "If you look at the way we use them, it makes sense. If you are in a high termite area, a high woodpecker area, or a high moisture area, you might only get a year to ten years out of a wooden pole." By contrast, the manufacturers say composite poles ought to last 40 to 125 years, even under harsh conditions.

—LAURIE A. SHUSTER