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Firm designs rare, reliable electrical systems

BY JEREMY VESBACH
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Flaviano Reyes feels fortunate. Reyes started his own electrical engineering firm two years ago, and Reyes Engineering has already grown to a staff of six.

Lately, the firm has been challenged with a series of commissions for a rare and complicated type of electrical setup.

Reyes thinks it's the start of a bigger trend.

High resistance grounding systems aren't just for steel mills anymore, Reyes said. HRG systems are a highly reliable power setup but an expensive undertaking. It's a type of system reserved for facilities that can't afford to shut down, for instance steel mills or other industrial manufacturers that work around the clock, companies where a shutdown would cost them millions of dollars.

Lately much of the telecommunications and high-tech industries have found that they can't afford to shut down either. So HRG systems – something that used to be considered only for very large industrial facilities – are now being used in smaller facilities that are nevertheless critical for a lot of people: an Internet service provider, for instance, or a 911 call-in center.

Ron Boger, a meter specialist with Portland General Electric, concurred with Reyes' market analysis. Boger said the HRG system is one he'd heard of but never dealt with until recently.

Boger had to send away for literature on the subject to educate himself and his staff, and make certain the HRG systems are metered correctly.

"We're starting to see a few pop up," Boger said. "We have to really look at the system to make sure the metering is set up correctly so there is no loss of revenue for the utility ... it was a real dilemma for us at first."

High resistance grounding systems are an alternative to ungrounded systems, which are often used in Europe, according to Reyes. However, a short circuit in an ungrounded system exposes workers to shock hazard. Most systems in the U.S. therefore are ground fault protected, which protects workers from potential shock hazards. The problem with a ground fault protected system is that if one piece of equipment fails, the whole circuit shuts down.

"Even for engineers it (an HRG system) is difficult to understand," Reyes commented. "It's a real challenge to explain in laymen's terms."

The advantage of a high resistance grounding system is that if something short circuits the whole system doesn't shut down. With an HRG system, everything else on the power circuit can continue to operate while technicians locate and correct the ground fault.

Facility owners don't even consider using an HRG system unless a licensed electrician is part of the staff, someone who can locate a ground fault while the circuit is in operation.

Reyes had to look as far away as a firm in Colorado for technical advice on Reyes' first HRG projects. With about 25 HRG systems to its credit, the RMH Group of Lakewood, Colo. is known as an expert in the field, Reyes said.

Reyes said the design of an HRG system is definitely a team effort. It's something that has to involve the architect, the electrical contractor and, especially, the power company.

"Portland General Electric had a big part in the designs," Reyes said. "The utility definitely has to play a part in the design of these systems."

Before starting his own company, Reyes worked for PAE Consulting Engineers in Portland, where he specialized in electrical engineering for hospitals – another field that required knowledge of highly reliable power supply systems.

Reyes Engineering has designed HRG systems in the Portland area for two telecom companies and a leading microprocessor manufacturer. Reyes now feels confident enough to offer advice to others about designing the systems.

"If there is another engineering firm here in Portland designing these systems for the first time, I'd like to help them out – same as the RMH Group did for us," Reyes commented.

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