



Equip Safety Case Study



Equip Partners with PRECO Electronics for Safety



Before a construction project can be started in the U.K., the site must be drilled so builders can fully understand the nature of the ground on which the foundation will sit. The rigs that do this drilling are extremely powerful, and entanglement with the drill has caused many human fatalities and injuries worldwide. Equip Group, located northwest of London, incorporates Equip Geosolutions. Equip Geosolutions develops new technologies for the global drilling industry and has developed the SAFER G system to prevent such accidents in the future. The system it has developed, utilizing PRECO Electronics' radar technology, has not only made rigs vastly safer, but it has also raised productivity to levels unseen in decades.

Prior to the enactment of new regulations ten years ago, there was no requirement across Europe that these drill rigs had to be guarded to prevent workers from coming into contact with a rotating drill. With the passage of the new rule, manufacturers responded by enclosing the rig entrance with heavy steel-

mesh gates. The gates have dramatically reduced death and injury, but they've caused problems too.

"The steel-mesh gates that now protect drill rigs have done a very good job of reducing injury and death to near zero," says Keith Spires, Equipe Group's Operations Director. "The unintended consequence of these gates has been an industry-wide drop in productivity, in some activities as much as an estimated 40 percent productivity has been lost. Our goal was to maintain drilling's excellent modern safety record while returning productivity to its prior level."

In the course of a normal drilling job, Spires says, in some activities such as grouting and anchoring workers can add 40-60 sections of drilling rods to enable the drill to reach required depths. Each time they need to add a rod, workers must open the gates, load the rods into the assembly, then securely re-close the gates. Repeating these extra motions so many times in a single day puts a big dent in the productive capacity of the rig.

On top of that, Spires says, the mesh gates have made it much harder for drill operators to visually monitor the rig making it harder for them to spot problems before they get worse. Staring through steel mesh, day in and day out also increases the eye strain on the operator. The gates are heavy and awkward and prevent operators from placing the drill rigs in tight spaces. These heavy gates also have huge maintenance requirements often resulting in more lost productivity with the downtime.



Short-range Radar Creates a Virtual, but Sensitive, Steel Gate



To improve the productivity of its customers, Equipe Group began looking for ways to replace these widely disliked gates with more modern safety technology. "We looked at infrared," Spires says. "We looked at laser scanners. We looked at ultrasonic. We finally decided that the best solution was short-range radar. That's when we started talking with PRECO."

Equipe Geosolutions' choice of technology hinged on a couple of different capabilities. First, the system had to be able to operate in dusty, dirty, vibration filled environments. It had to be strong enough to operate even after being struck by a drill pipe and other objects as workers operated the rig. The most challenging capability was the need to be intelligent enough to detect some objects while ignoring others.

"For us, everything is designed around the human hand," he says. "There can be all kinds of material ejected from the rig – big chunks of mud, rock, fluids, and the resulting dust. Some of the technology we looked at would react to a grain of sand in the air and shut the drill down. We needed a system that wouldn't react to anything smaller than a hand. But once it detected a hand (or anything larger), the sensor had to be able to react instantly to bring a drill spinning at 1,500 rpm to a complete stop."

[Equipe Geosolutions' SAFER G solution](#) is comprised of specially designed PreView Radar sensors bolted on either side of the rig entrance. The sensors are mounted on rubber cushions to reduce vibration, and are retrofitted with visible lights so rig teams can be sure the devices are operating.

The SAFER G solution is designed not to warn workers of danger, but to remove the danger itself. When a worker gets within about 4 feet (1.24 meters) of the rig, the radar sensors detect the person's presence and within 200 milliseconds sends a signal to the machine to stop. The motor then has another 600-800 milliseconds to bring the drill shaft to a complete stop to prevent the worker from becoming entangled in the drill.

To make sure that the solution works for each individual drill rig, Equipe Geosolutions customizes the sensors to fit each drill rig. First, it measures how long it takes that rig's drill shaft to stop spinning once the motor is shut off. Then it places the sensors in strategic locations to ensure that the shaft will come to rest well before the worker reaches it – every single time.

The SAFER G Solution Wins Cross-Europe Safety Seal



Spire makes his safety claim with the assurance that comes from literally millions of hours of testing. Before a manufacturer in the U.K. or Europe can put any product on the market, it must obtain what is known as a CE Mark. Earning this safety certification, he says, is not easy.

“There are about 100 individual components to the SAFER G solution,” Spire commented. “Not only did we have to prove that each component was reliable, but we also had to show that no matter what component or combination of components failed, but SAFER G would also still bring the drill shaft to an immediate halt. And we had to prove that this would be

true amid rain, snow, heat, dust, and mud – in very high and low temperatures and ranges of humidity. As a final fail-safe guarantee, we install two sensors on each rig to provide redundancy.”

“PRECO made the task of earning the CE Mark easier by delivering radar units that simply do not fail,” Spire remarked. “We tested the PRECO sensors so many times that at one point I finally said ‘obviously PRECO’s manufacturing process must be spot on because these units just do not fail.’”

New Solutions Keep Safety Benefits, Returns Productivity to Previous Levels

The startling news for Equipe Geosolutions customers was that the precipitous drop in productivity that came with the steel gates could be regained.

“The sensors certainly speed up drill operations again,” says Spire. “Without the SAFER G radar sensor system, every time you want to do something at the drill head you’ve got to open the gate, and then the drill won’t start up again until you shut the gate. The introduction of drill rig gates caused a 40 percent drop in productivity. Equipe Geosolutions’ PRECO PreView Radar-enabled safety system, SAFER G, has boosted productivity back to where it was before.”

Using PreView Radar to Take Action, Not Give Warning

Equipe Geosolutions use of short-range represents an innovative application of PRECO's technology. Normally, customers use PreView Radar sensors to warn equipment operators of approaching danger. Once alerted, the driver must apply the brakes or take evasive action. For Equipe Geosolutions the goal was to remove the danger altogether.

Spires says the [SAFER G solution](#) comes at an interesting time. While the U.K. has had the rig protection regulation in place for a decade, it has only recently been put in place across Europe. Spires says his company's goal is to demonstrate to rig manufacturers across the U.K. and Europe that their PRECO enabled solution makes drill rig injury and death a thing of the past – and does so without those heavy, productivity-killing steel gates.

[Equipe Geosolutions Safer G Sensor](#) from [PRECO Electronics, Inc.](#) on [Vimeo](#).