



# Utilizing Cellular LTE for Direct Transfer Trip of Distributed Generation

## THE SCENARIO

A power utility has an increasing number of large-scale third-party generation being connected to the grid.

For protection and safety reasons some of these generators are required to have islanding protection facilitated by Direct Transfer Trip (DTT) communications between utility and generator.

Because of the difficulty or inability to obtain leased T1 or audio tone lines from a telecommunications provider, or the feasibility of running dedicated fiber, there are limited options available for establishing a suitable communications channel with the generator that are cost effective and reliable enough.

## THE SOLUTION

This solution was developed primarily for the Distributed Energy Resource (DER) and Distributed Generation (DG) market, where communications facilitating anti-islanding and islanding detection are challenging. This joint solution between, HPS/RFL and GE Industrial Communications provides a communications alternative to traditional means with significantly lower operating cost, while maintaining critical performance requirements including latency, security, and dependability.

Integral to the solution is the RFL GARD 8000 equipped with the Ethernet Teleprotection System (ETPS) module and the GE MDS Orbit LTE Cellular router. These two devices work simultaneously to securely deliver DTT signals from electric utility substations and line reclosers to generation facilities utilizing public or private LTE networks.

Several redundancy options are also possible, including dual SIM and parallel path communications, seamlessly leveraging multiple carrier networks as well as legacy communications methods. For cybersecurity, GRE tunneling, VPN and 256-bit encryption are employed.

## THE RESULT

The power utility has been able to successfully integrate new third-party generation, including renewable resources, onto their system.

The DTT requirements of these projects have a relatively low recurring communications costs, helping the generator recover development costs sooner. Additionally, it has become more feasible for more projects to commence that would otherwise potentially been cancelled due to high communications costs.

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## THE RESULT CONT'D

At the same time it was not necessary for the utility to compromise on its DTT requirements and was able to maintain existing protection and safety standards.

Because the LTE Cellular networks are a primary focus of the providers, reliability of the communications circuits is no longer a major concern as with existing T1 and audio tone leased lines, significantly reducing the number of unwanted interruptions to generation.

FIGURE 1: Cellular DTT with Dual Carrier and SIM Switching

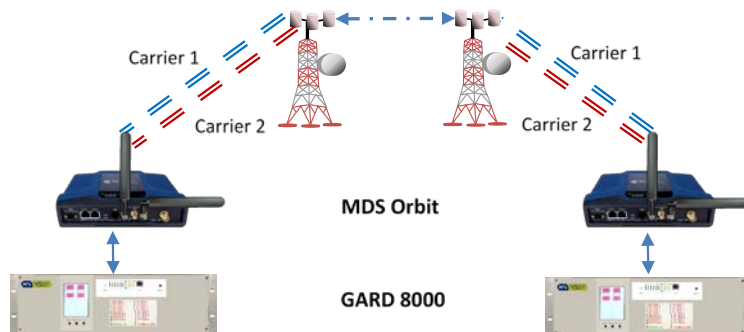
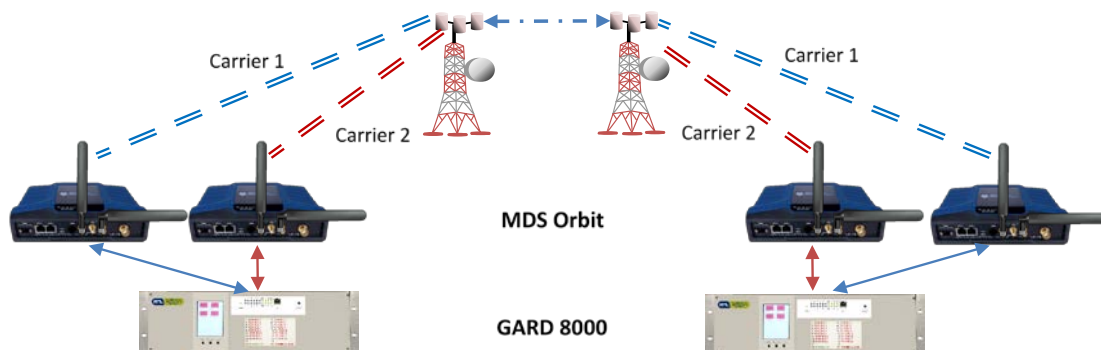


FIGURE 2: Cellular DTT with Parallel Dual Carriers



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