



CASE STUDY

# INCREASING FUEL VISIBILITY FOR 10K SITES FOR A US MOBILE NETWORK OPERATOR

## Introduction

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Cell phone networks become critical public safety infrastructure during major natural disasters. After Hurricane Sandy in the northeastern United States, many cell site locations were forced to operate on backup power sources for up to several weeks, leading to generators running beyond their fuel storage capacity. Our client re-fueled generator tanks, but it was a complicated process due to conditions on the ground and extremely inefficient as the Network Operation Center (NOC) had no visibility on fuel levels. There was no way to establish a priority of which sites needed re-fueling first.

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## Customer Challenge

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In the aftermath of Hurricane Sandy, our client decided that they need better and more actionable data regarding generator fuel levels. During an incoming extreme weather event such as a hurricane, the client wanted to have full visibility into their fuel levels to prioritize the re-supply process. Initially, they were seeking a very small device just to monitor and transmit fuel tank levels. After working with Asentria, the client discovered the potential of a telecom site automation solution and decided to use a more evolved device with the ability to collect important data about generators' alarms and maintenance needs.

In discussions with Asentria, they found that there were additional desirable functions related to controlling the automatic transfer switch (ATS). During high smog events in urban areas, the client wanted to ensure that they have the option to turn off their diesel generators if needed, to avoid the fines imposed by the US Environmental Protection Agency. At the same time, the client intended to correct the issue with inaccurate timers that allowed generators to run outside of approved noise ordinance schedules. Eventually, they also wanted to save money on maintenance contracts by moving from a time-based service maintenance cycle for generators to those based on actual generator run-times.

There were also problems related to the deployment of mobile communications vehicles commonly referred to as cell-on-wheels (COW's), cell-on-a-light truck (COLT's), and generator-on-a-truck (GOAT's), which were intended to supplement the existing fixed wireless infrastructure. While these vehicles could report on their location when operational, it was challenging for the NOC to know the location of these vehicles when they were not in deployment, or when they were en route to a disaster site. Once deployed, they could report on where they are, but then suffered from the same problems as the fixed wireless sites in reporting back on their generator fuel levels.

## Objectives

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- ➔ Ensure full visibility into generators' fuel levels during extreme weather events.
- ➔ Identify problems with generators in the coming days before a hurricane's landfall.
- ➔ Option to turn off diesel generators during times of poor air quality.
- ➔ Collect data on generator run-times.



## Solution

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Initially, the client was seeking a very small device just to monitor and transmit fuel tank levels. After working with SiteBoss and seeing its potential for Telecom Site Automation, they decided to use an even more evolved version able to collect significant data about generators' alarming and maintenance features and to give future flexibility to manage other power, security, and environmental issues. At an early stage, the SiteBoss S550 was tied to the automatic transfer switch (ATS) to allow centralized control of running the generator network. The Asentria SiteBoss S550 is a versatile and powerful system used for monitoring and control of remote equipment sites. The S550 provides remote monitoring of equipment, generator fuel levels and environmental conditions at these remote sites and forwards notification when conditions fall outside limits.

Later on, it was possible to take the generator exercising decision-making away from the ATS and give more direct control to the NOC personnel. In some locations, this helped avoid conflict and fines with the Environmental Protection Agency for running the generators during times of poor air quality. The SiteBoss enabled the NOC to choose when to cycle, or not cycle, segments of their diesel generator network based on the relative air quality. It also could report the success or failure of the generator exercising, as well as other variables, to the NOC.

Asentria provided extensive integration services to make the SiteBoss a single common interface to multiple generator models and to make the SiteBoss a single interface to all generators. An additional benefit to using the SiteBoss is the SiteBoss' ability to collect and alarm on elements of power, security, and environment in a format that was common to the network management system. The SiteBoss is now deployed with diesel, LP, natural gas roof-top generators, and on mobile cell-on-wheels (COW's) or generator-on-a-truck (GOAT's).



## Customer Benefits

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- ➔ Identify problems with generators in the days before a hurricane's landfall.
- ➔ Full real-time visibility into generators' fuel tank levels.
- ➔ Option to turn on/off diesel generators when needed.
- ➔ Correcting clocks to allow for accurate timing of generator exercising.
- ➔ Allow maintenance cycles based on actual generator run-time.
- ➔ Secure port forwarding or remote desktop to on-site equipment interfaces.
- ➔ Out-of-band (eg. cell modem) access to remote network equipment.
- ➔ External environmental sensors with individually configurable alarming functionality.
- ➔ Web interface for easy configuration.

**About Asentria** - A 30-year-old company based in Seattle, Washington, with multiple hardware deployments of 10,000 and more sites in the largest mobile network operators worldwide.

