

# Improving In-Building Cellular Coverage at Utility-Scale Solar Power Plants



Case Study courtesy of  
**Twin Eagle Solutions**  
Littleton, CO

## Challenges

Remote utility-scale solar sites and substation control buildings had little to no reliable indoor cellular coverage.

## Solution

Nextivity CEL-FI GO G43 smart signal booster installed to deliver carrier-approved, multi-operator indoor cellular coverage.

## Installation

The system was deployed with outdoor donor antennas, indoor server antennas, and site-specific RF optimization across multiple solar power plant locations.

## Results

The deployment delivered strong, reliable LTE and 5G coverage, improving voice, data, safety, and operational efficiency.

## Challenge

Utility-scale solar power plants are frequently constructed in remote and rural locations, where macro cellular network density is limited and baseline carrier signal levels can already be marginal. While these locations are ideal for renewable energy production, they present significant challenges for reliable wireless communications.

Within these sites, substation control buildings pose an additional layer of difficulty. These buildings are purpose-built to withstand harsh environmental conditions such as extreme heat, dust, wind, and electrical interference. As a result, they are typically constructed using reinforced concrete, steel, and metal-clad enclosures—materials that severely attenuate radio frequency (RF) signals.

At this client's solar power plants, the combination of limited rural carrier coverage and RF-shielding building construction resulted in:

- Minimal to nonexistent cellular signal inside substation control buildings
- Inability for personnel to reliably place or receive voice calls
- Poor data connectivity impacting commissioning, maintenance, and troubleshooting
- Lack of consistent service across major mobile network operators (MNOs)

Because plant personnel rely heavily on cellular connectivity for operational coordination,



remote support, and safety-critical communications, unreliable in-building coverage introduced both operational inefficiencies and potential safety risks.

Recognizing the need for a robust, carrier-agnostic solution capable of overcoming these environmental and structural challenges, the client engaged Twin Eagle Solutions to design and deploy a reliable in-building connectivity solution across multiple solar power plant sites.

## Solution

After evaluating existing site infrastructure and reviewing available coverage options, Twin Eagle Solutions selected the CEL-FI GO G43 smart signal booster from Nextivity.

Why CEL-FI GO G43?

- Supports simultaneous signal amplification from up to three carriers
- Carrier-approved and operator-safe
- Dynamically adapts to changing RF conditions
- Ideal for critical infrastructure and industrial environments

At the core of this solution is Nextivity's patented IntelliBoost® technology, which continuously maximizes uplink and downlink signal levels without introducing interference into the network. This self-optimizing behavior enables best-in-class signal quality even in challenging RF environments such as substations and control buildings.

Twin Eagle Solutions designed, installed, and commissioned CEL-FI GO G43 systems at multiple solar sites, using site-specific survey and as-built data to ensure optimal antenna placement and performance

## Installation

The installation included outdoor donor antennas positioned to capture the strongest available macro-network signals and indoor server antennas designed to deliver uniform coverage throughout the control buildings. The system was configured to support AT&T, T-Mobile, and Verizon, including available 5G bands, and was optimized using real-world RF measurements to ensure reliable performance at each site.

## Results

Post-deployment testing confirmed a dramatic improvement in indoor cellular performance across all major carriers. Before deployment, many carriers had little to no detectable signal inside the building, with RSRP levels as low as -118 dBm and unstable RSRQ readings indicating poor signal quality. After the CEL-FI GO G43 solution was installed, all major carriers achieved strong, usable LTE and 5G coverage, with RSRP improving to between -77 dBm and -52 dBm and RSRQ stabilizing between -11 and -16 dB. The result was reliable voice and data connectivity that improved site communications, safety, and operational efficiency.

