HOLT Industrial Rentals CAT

CASE STUDY:

**Construction Site Power**

# TOWER CRANE HYBRID POWER

## THE GOAL

Reduce fuel consumption and generator runtime while maintaining reliable, around-the-clock power for a tower crane on an active construction jobsite.

## CHALLENGES

- **Tower cranes require 24/7 power for lighting, creating severe generator underloading during non-lift hours.**
- **Tier 4 generators operating at low load risk wet stacking, inefficient regen cycles, and higher fuel costs.**
- **Any crane downtime directly impacts construction schedules and multiple trades working in sequence.**

## THE SOLUTION

For this project, a construction customer referred by Texas First Rentals approached HOLT Industrial Rentals to solve a persistent and costly problem common across construction jobsites — tower crane power inefficiency. The multi-unit student housing project near UT Dallas in Denton relied on an 80-foot tower crane that historically would have required a large generator running 24/7.


Traditionally, contractors address this challenge by running non-tiered generators or adding external load banks to artificially increase load. While effective in theory, those approaches still burn fuel continuously and offer no meaningful reduction in runtime. Instead, HOLT Industrial Rentals proposed a hybrid power solution designed specifically for commercial construction applications where loads fluctuate throughout the day.

**Hybrid Power Built for Construction Jobsites**

HOLT Industrial Rentals deployed a Cat® XQ425 generator paired with a 500 kVA / 250 kWh HOLT Industrial Rentals battery or Energy Storage System. The system was configured so the battery carried the crane's base load — including lighting — while the generator only engaged when the battery state of charge dropped to 35%. When the generator did run, it powered the crane and simultaneously recharged the battery.

***Power, Compressed Air, Temperature Control***

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This setup resulted in a consistent operating cycle of approximately 10-12 hours on battery followed by just 45 minutes of generator runtime. Importantly, when the generator was online, it operated at roughly 75% load — an ideal range for a Tier 4 engine. This eliminated underloading concerns while significantly improving fuel efficiency and engine health.

***" This was our first time using a hybrid power solution. Having another power source on the crane meant less downtime, better reliability, and lower fuel costs. The Texas First Rentals and HOLT Industrial Rentals teams made the setup easy, so we could stay focused on the job and keep the schedule moving."***

*– Patrick Nance, Superintendent, Broeren Russo Builders Inc.*

**Measured Results on an Active Tower Crane Project**

Throughout the 170 days of operation, the tower crane consumed 4,241 gallons of diesel. Without the battery system, the generator would have been required to run continuously, with projected fuel consumption exceeding 11,000 gallons over the same period.

From a cost perspective, the customer estimated diesel expenses would have reached roughly $48,000 using a traditional setup. With the hybrid solution, fuel costs were reduced to roughly $17,000.

The set-up meant consistent, reliable crane usage throughout heavy usage supporting framing, plumbing, roofing, exterior finishing, AC unit installation, and safety camera installation. Crane downtime over the entire project totaled just two days.

## EQUIPMENT UTILIZED

**500 KVA/250 KWH**
**ATLAS COPCO ESS**
Voltage: 480 V
Frequency: 60 Hz

**CAT® XQ425 GENERATOR**
Standby 375 kW
Prime 340 kW
50/60 Hz Switchable
1500-1800 rpm

The project marked the first time this customer used a hybrid generator and battery system — and also the first time the HOLT Industrial Rentals team implemented this specific configuration for a tower crane. Ultimately, this case demonstrates how hybrid power is not just viable for construction jobsites — it is a practical, proven solution for tower cranes where fuel efficiency, reliability, and uptime directly impact project success.

***" This project is a strong example of how hybrid power can directly solve real construction challenges, not just reduce emissions on paper. We're helping contractors keep cranes running reliably while dramatically reducing fuel costs and unnecessary generator hours."***

*– Brian Rice, Director of Operations, HOLT Industrial Rentals*

## DID YOU KNOW?

**Generator underloading is a common issue on construction sites that rely on large diesel generators to power equipment with intermittent demand, such as tower cranes. Operating generators at low load for extended periods can lead to inefficiencies, higher fuel consumption, and maintenance challenges such as wet stacking in Tier 4 engines. Hybrid generator and battery systems help address this by allowing generators to run at higher, more efficient load levels while batteries handle low-demand periods. This approach can significantly reduce runtime, emissions, and operating costs on long-term construction projects.**