



# UPS Substation

## UPS Substation

**LOCATION**

Salt Lake City, UT

**CONSTRUCTION START**

October 2017

**CONSTRUCTION END**

March 2018

## Highlights

**DURATION**

25 Weeks  
(From NTP to Energization)

**DEPLOYMENT METHODOLOGY**

CI integrated skidded solution with CI Plant terminated and tested control system

**DESIGN STRATEGY**

Utilization of completed modular design elements limiting design variables and allowing for an expedited deliverable with proven assemblies

**SCHEDULE STRATEGY**

Paralleling of traditional critical path elements such as fabrication, assembly, and testing that occurred in the CI Plant vs waiting to be performed in the field after shipment

With the ever increasing need for renewable generation in the United States and the increasing aging infrastructure surrounding transmission and substation assets, the need for improved interconnection services is at an all-time high.

## THE CHALLENGE

Construction Innovations (CI) was approached by Hunt Electric (Hunt) to engineer, design and manufacture a substation in Salt Lake City, UT interconnecting a UPS facility (UPS Substation) to the utility, Rocky Mountain Power.

Understanding that major equipment alone can run up to 26 weeks lead time, designing and building an entire substation in 25 weeks was definitely a challenge but CI was up to the task.

With a challenging budget and an aggressive schedule, Hunt opted to reach out to CI directly. The contract was executed and notice to proceed (NTP) was issued on October 2, 2017 to design and build a substation by March 31, 2018.



**“Thanks to CI's innovative solution, the UPS substation was built using only 4 non-technical staff and increased our profit margin significantly.”**

- Troy Gregory  
President  
Hunt Electric, Inc.





## Project Scope

### UTILITY FEED

1 - 3 phase 138kV overhead transmission feed into the station

### HIGH SIDE

2 - 138kV circuits with redundant switches, breakers and 14.4MVA transformers

### LOW SIDE

2 - 12kV circuits ran through voltage regulation with a breaker tie connecting them

### LOAD

2 - 12kV circuits were converted to underground running through a pad mount switch and then over to the medium voltage (MV) service panel at the UPS facility

### PROTECTION AND CONTROL SYSTEM

1 - CI fully integrated control building with protection, control, battery backup and proprietary power & control harness assemblies



## OUR SOLUTION

CI knew that due to the compressed schedule and budget that a traditional “stick built” substation would not suffice. Therefore CI began performing many of the traditional critical path elements in parallel started engineering immediately.

CI leveraged its extensive supply chain, logistics and value recognition expertise to source sub-systems and parts to meet the exact vision and timing for the project. CI was then able to move from NPT to drawings issue for construction in 8 weeks.

Once IFC was completed, CI began fabrication of the high side steel, low side skids and control building in their 320,000 ft<sup>2</sup> manufacturing facility in Sacramento, CA.

Each of the two low side skids consisted of voltage regulators, a takeoff structure, station service transformers and integrated controls. The control building accommodated 3 relay racks with full protection scheme and real time automation controller (RTAC), battery back-up system, and a desk and drawing control area.

Power and control harness assemblies, pre-programmed relays and electrical equipment were point-to-point tested at the CI plant. All components were assembled and/or packaged in a controlled, factory

environment and labeled for easy deployment by the onsite installation team.

The contractor mobilized the first week of February and started below grade activities. CI shipped the two MV skids the middle of February to which they were installed 2 days after the concrete piers were tested acceptable for strength to support the load. The control building and all control cable were installed in just 2 days. Testing and back feed to the station were performed the 3rd week of March and the station was ready for full energization by March 31, 2018.

All components were assembled in a controlled, factory environment and packaged and labeled for shipping direct to the job site.

## RESULTS

CI sent a substation Field Engineer to work with the contractor throughout the field process. Hunt was amazed by the ease of the installation process and ability to construct the entire station without needing any substation electricians. Installation of the CI solution was so simple, that it was done by two linemen and two laborers who had never built substations before!