Category: Meeting the Challenege of a Difficult Job- Specialty Contractor

Contractor: Kenny Electric

Project Name: United Airlines Training Facility

Taking Flight: The Journey of Simulating Excellence

In 1929, the people of Denver, Colorado decided they needed commercial aviation. The city landed its sights on a parcel of grassland near I-70 and Quebec. The Stapleton Airport grew from its original 640 acres to over 4,700 acres becoming the 5th busiest airport in the United States, until it closed in 1995. By 2015, the only structures remaining, except for the control tower, were a few buildings used by United Airlines for training. The old airport stood forgotten until it was resurrected and redeveloped for residential, commercial and retail projects, and a new state-of-the-art United Airlines Flight Training Center.

In 2015, The City of Denver competed for an opportunity to become the Headquarters for United Airlines' new National Flight Training Center; a facility that would combine the capabilities of its scattered, regional locations into a consolidated training site for top pilots around the world. Since United was already using some of the existing buildings at the abandoned Stapleton Airport, and the sparsely populated facility had the capacity for additional use, these factors influenced the decision, driving Denver to win the bid. United selected Mortenson Construction to begin the task of transforming six buildings, some 50-years-old, into a state-of-the-art training facility. With the need for a high-performing, technical team to compliment Mortenson's vision, Kenny Electric was chosen as its design-assist partner, working on a guaranteed, maximum-price, and fixed-fee contract for all of the electrical and low voltage systems. Thus began the lengthy three-year journey to what is currently Kenny Electric's largest contract in company history.

Solutions of Special Projects:

The United Airlines Training Facility (UATF) is a 23-acre site with a total of six buildings and over 400,000 square feet of finished space. The facility houses 32 flight simulators as well as 24 training classrooms, where pilots and flight attendants worldwide receive continuous training.

The buildings were outdated, many not having seen a hammer in over 60 years. Not surprisingly, before the construction launch, Asbestos was discovered throughout the facility. Safety takes priority when handling this toxic substance. According to OSHA, "There is no *safe* level of Asbestos exposure for any Asbestos fiber." As the result of added safety protocols and abatement implementation, the project underwent extensive rescheduling. Mortenson made a considerable effort to ensure everyone at the job site was protected from exposure. In kind, each sub-contractor worked to find solutions that would help the team to meet the original completion date without sacrificing safety.

Many areas of the facility were off-limits during the abatement stage. So, Kenny focused its attention on finding alternatives and productive avenues to perform their work. The team utilized virtual construction methods to pre-plan and pre-build the layout of the conduit, racking, cable trays, and vast amounts of electrical distribution equipment.

The original scope of work was massive but became further complicated as the project doubled in size with little change in completion timelines. In an interview conducted with Kenny's project manager, Josh Palaszewski, he vocalized, "I have worked in the electrical industry for over twenty-one years, and this is by far the most difficult job I have ever been a part of." During onsite interviews, many people echoed these sentiments. "Complex, strenuous, and complicated" were common terms used to describe this project.

Another aspect that added to the layer of complexity was a requirement that the existing flight simulators remain in full operation for 20 hours-a-day, seven-days-a-week. This stipulation required our team to work in multiple shifts. Also, our electricians had to approach work done near simulator units with extra caution because the erratic movement of the pods running a flight simulation, could prove to be a safety risk. Platforms were built 40 feet above the floor, covering

the entire simulator bay, so United could conduct training while work was being performed. Kenny Electric recorded roughly 400,000 workforce hours on this project.

Excellence in Project Execution and Management/ Team Approach:

Kenny Electric was responsible for anything having to do with pipe or wiring. Our scope of work varied depending on the building.

Buildings A, B, C and F:

- Replacement of main S-distribution switchboards and electrical infrastructure to simulators and mechanical equipment
- Expansion/ Building of the electrical room in the basement of building B for new main switchboard room
- Updating of all lighting fixture and controls

Building D:

- Re-routing the 13,200 volt feeders from under simulator bays
- Installment of two medium voltage transformers (A-grade level) on the east side of the building
- Installation of electrical infrastructure for new simulators
- Replacement of main distribution switchboards
- Installation of UPS system for all simulators for power conditioning and backup power
- Updating of lighting fixtures and controls
- Installment of a lightning protection system

Building E:

- Installation of electrical infrastructure of two new flight simulators
- Replacement of main distribution switchboards and electrical infrastructure to simulators and mechanical equipment
- Installation of UPS system for all simulators for power conditioning and backup power

- Installation of a lightning protection system

With this level of responsibly, our goals were simple - satisfy our customer and execute the tasks with maximum safety and efficiency. Communication was the critical bridge between vision and completion of project tasks. Every morning our project managers met to devise a game plan to reach maximum productivity. Kenny's leadership team were in constant contact with Mortenson and the other trade partners as well as United Airline's flight simulator technicians, building maintenance crew, and company directors gathering all information needed to build schedules and avoid interruption of the client's work. Kenny drafted "MOP" (Method of Procedure) documents which contained step-by-step directions and a timeline of task completion targets.

Our team created and executed over 200 MOP's, some containing over 150 line items. These documents were a compilation of 8,000 hours of meetings that proved instrumental to the success of the project. One example centered on how to handle the installation of several older flight simulators, some over 20 years old, containing aging electrical systems These specialty tasks required us to pre-provision and then adjust the timing to allow proper investigation of the numerous electrical and control feeds, to ensure there was no power interruption when the new power source fed into the simulators.

Construction Innovations/ State-of-the-Art Advancements:

Kenny Electric uses Building Information Modeling (BIM) technology to drive consistency and optimize workforce hours on the job, as was evident in this project's fire safety system installation. The Denver Fire Department required integration between the simulators and the building's fire system. The client chose a highly-advanced, pre-action system that included a dynamic system processor and user-friendly HMI screens showing graphic structural maps. These panels were custom built by Kenny Electric in our UL508A panel shop.

Without utilizing the modeling plans available with the BIM technology, this stage of the project could have taken months vs. weeks. The Kenny team was able to map out and coordinate installation procedures without having to step a foot on the job site. Mortenson and United were

impressed with not only how we used the technology but also how it helped simplify the installation to keep the project timeline on track.

Another example involved one of the oldest simulation pods at the training center, lovingly called Christine. The pod, named after the title of the 1983 film starring a 1958 Plymouth Fury with a mind of its own, has complex hydraulics and experiences frequent issues. Due to its large number of fluid mechanics which need constant monitoring, and the dated monitoring system located in the basement, Kenny suggested installing a high-definition camera aimed at the basement unit which has allowed for the maintenance team to capture fluid leaks and avoid equipment malfunction.

Environmental/ Safety:

Understanding the hazards of this job site was integral to keeping the project's workforce safe. Our team maximized the use of advanced technology, and LOTO procedures became a second language. With each simulator requiring multiple feeds and utilizing approximately 400 amps, it required hundreds of energized work permits. To combat the risks, Kenny conducted daily safety meetings, reminding the team of the ever-changing risks and hazards on the job site. Although scheduling was a priority, it always fell secondary to ensuring every employee went home safe every day.

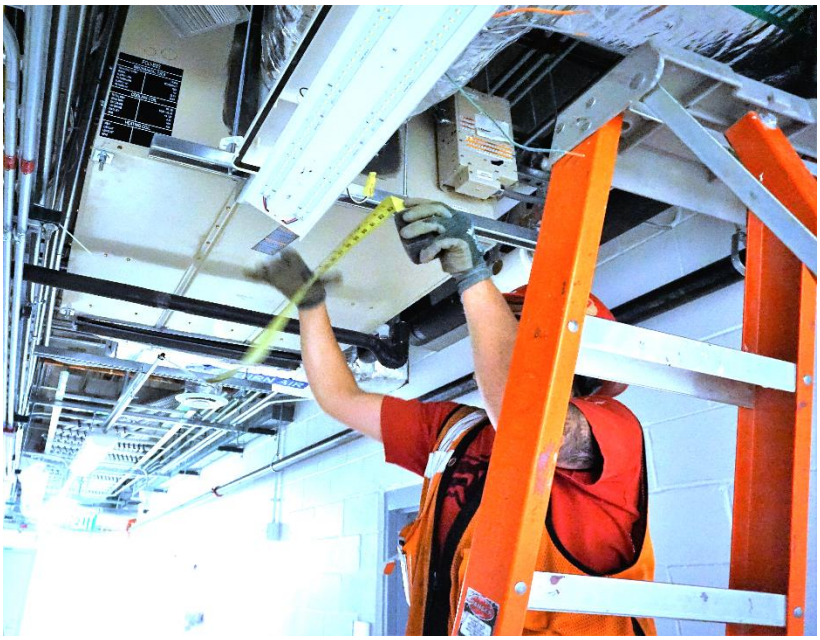
Excellence in Client Service and or Contribution to the Community:

The purpose of the (UATF) is to keep the skies safe for millions of travelers by ensuring pilots and flight attendants are well-equipped for aviation work. It was humbling to be a part of this three-phase, three-year project, having the opportunity to work alongside the team at United Airlines and Mortenson Construction, not only to resurrect and repurpose a field of toxic, abandoned buildings, but to create an advanced center solely focused on the safety of others. We believe this $30 million project has driven greatness from within every member of our team, from project managers to 1st-year apprentices alike. Although this journey experienced some turbulence - together we executed a perfect landing.

Caption: Kenny Electric's Director of Commercial Operations, Sean McMahon (left) and project manager Josh Palaszewski (right) conversing on the success of the United Airlines project.

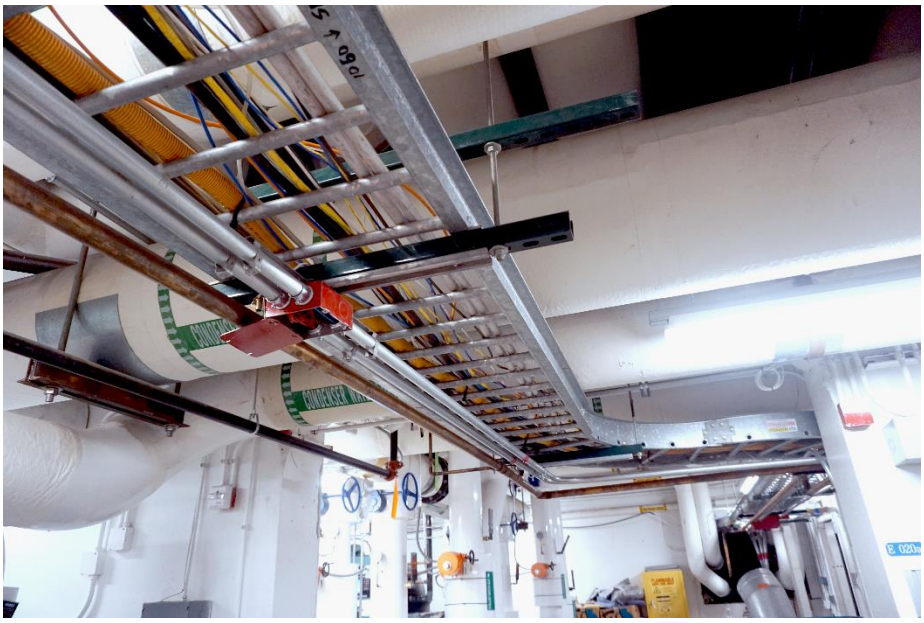
Caption: 2017 flight simulator model.

Caption: Flight attendant and pilot training room. Kenny Electric was responsible for all lighting as well as VESDA installation.

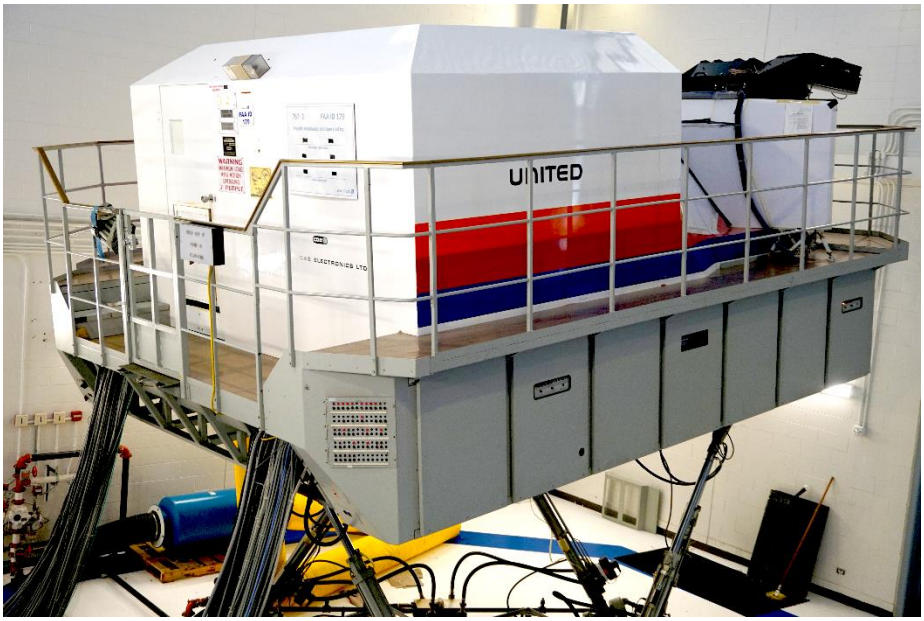


Caption: Cable tray installation in an extremely congested ceiling.

Caption: Conduit installation in large main electrical room. This was one of the many areas where asbestos was found.



Caption: Cable tray for power and controls serving the complex mechanical systems.



Caption*:* *Christine*, the oldest but still operational flight simulator in the fleet.

Caption: Hydraulic control equipment for *Christine.*

Caption: Custom built EPO fire suppression control box built by Kenny Electric. These were placed in every simulator control room.

Caption: Safe practice of Lock-Out-Tag-Out (LOTO) method by our team. Critical process while working with energized equipment in a fully functioning environment.