

Arc Flash Power Study and Analysis

CLIENT: **CONFIDENTIAL**
MARKET: Chemical Process | Petrochemical | Refining
LOCATION: Beltsville, MD and Baltimore, MD
TAI SERVICES:

- Arch Flash Analysis
- Training
- Power Study Fault Analysis
- Coordination Study

COMPLETED: 2018
VALUE CLASS: \$18,060

ABOUT: *The Client endeavors to be the world leader in the paint industry committed to satisfying customer needs through quality products, excellent service and a highly trained and professional workforce.*



CHALLENGE

TAI performed an electric short circuit and arc-flash hazard evaluation for the existing power distribution system at Client's Beltsville, Maryland facility. TAI also conducted a one-day Arc-Flash training seminar and a short-quiz at the end of the session. TAI provided all material associated with the training.

SOLUTION

The Arc Flash evaluation included distribution equipment including LV Distribution Panels, LV MCCs, LV Transformers and Disconnect Switches. TAI used the previous study from 2009, field survey data, existing single line drawings, existing manufacturer submittal data and any existing as-built drawings to develop and build an SKM model for the Beltsville Plant's electrical distribution system. TAI also required technical information from the Utility.

Specifically, TAI performed:

- Field work to verify and document all existing electrical components included in the analysis.
- Fault Analysis of the system per ANSI and IEEE standards using the Comprehensive Fault Analysis module from the SKM Systems Analysis PowerTools for Windows (PTW) systems analysis software.
- Arc Flash Analysis of the system using the SKM Arc Flash Evaluation Module.
- A report of the entire Arc Flash Analysis
- Single-line diagram drawings of the entire distribution system, including the following information:
 - o Circuit breaker, fuse, and protective relay model numbers
 - o Nominal current rating of each overcurrent protective device
 - o Cable size, approximate length used in the calculations, and ampacity
 - o Transformer size, impedance, primary and secondary voltage
 - o Voltage rating of each bus
 - o Maximum arc flash incident energy at each bus
 - o Arc flash PPE rating required at each bus
 - o Arc Flash Hazard Labels for application to all relevant buses in the system. Labels were customized to suit the Client's standards and were in compliance with NFPA 70E.

RESULTS

A report of the entire Arc Flash Analysis summarized significant findings in both narrative and tabular format. For buses with high PPE ratings, recommendations were provided to lower the PPE rating. The report included appendices to show all necessary input data and calculated results. TAI also provided an arc flash training class for client's maintenance personnel. The class informed the students of the dangers of arc flash, how to interact appropriately with energized equipment, lock-out/tag-out standards, the rating and use of different PPE, and how to interpret a typical Arc Flash warning label. The training class included a reference manual for each student, as well as a test and certificate of completion.