



Project Profile: Power Systems

COMPANY

Arch Chemicals, Inc.
Brandenburg, KY 40108

PROJECT TITLE

Power System Analysis

SERVICES PROVIDED

- Field survey of power system hardware
- Short circuit analysis
- Power flow analysis
- Protective device coordination.

SOFTWARE

- SKM System Analysis, Inc. Power Tools for Windows – Dapper 3.8, short circuit analysis software.
- Coordination, Inc. CYMTCC 4.02, coordination development software

OBJECTIVES

- Determine if the overcurrent protective devices can safely operate under fault conditions.
- Determine if there is a reasonable load balance between four parallel 4.16kv feeders.
- Determine the extent of voltage drop through the plant.
- Develop protective device coordination curves for the majority of the power relays and circuit breakers.

PROJECT DESCRIPTION

Performed an extensive field survey of the plant's transformers, feeder cables, power switchgear, large motors, protective relays and circuit breakers. Analyzed the plant's 69kv, 4.16kv and large 480v distribution systems to determine the capacity of the overcurrent protective equipment to safely open circuits under fault conditions. Analyzed parallel feeders supplying 4.16kv switchgear to determine the balance of power flow through the feeders. Developed updated coordination curves for the overcurrent protective equipment and determined if there were areas of the plant where voltage drop would be excessive.

TECHNICAL DETAILS

The plant has dual 69kv services from the utility, with only one service normally used at a time. The service feeds two 15,000 kva transformers that are resistance grounded. Each transformer supplies a lineup of 4,160v switchgear. The two sets of transformer switchgear feed two primary distribution switchgear units. The first primary switchgear unit is double ended, being fed from both transformer switchgear units. The second primary switchgear unit has four feeds, two from each of the transformer switchgear units.

Both of the primary switchgear units have all of their supply feeders connected at all times providing continuous on-line redundant supplies.

The remaining distribution consisted of 4,160v feeders to large motors and 480v transformers. The majority of the power distribution system was thirty to forty years old and the last analysis was performed over twenty years ago. Due to the age of the switchgear, data on the equipment was hard to find making the analysis difficult. The end result of the project was an in-depth report of the condition of the switchgear and overall power distribution system along with recommendations for further analysis of potential problem areas.