THOR ENGINEERING, LLC – POWER SYSTEM STUDIES

Thor Engineering, LLC offers a full complement of services to help you document your existing Electrical System, identify deficiencies and improve the reliability and safety of your system.

Service Offerings:
Electrical One-Line Creation
Load Study
Short Circuit Study
Coordination Study
Arc Flash Hazard Analysis
Harmonic Analysis
Power Factor Correction

Field Engineering Services:
Data Collection
Inspection of Equipment
Thermal Imaging
Metering for Harmonics
Metering for Load
Energy Audits

Other Services:
NFPA 70E Training
Electrical Safety Program Development
Arc Flash Warning Label
Custom Printing

In-House Software:
ESA, Inc. EasyPower
SKM Systems Analysis, Inc.
AutoCAD
LOTO Software
Label Printing Software

Our goal is to make your electrical system safer and more reliable.

To learn more about our Comprehensive Engineering Services, contact:

Thor Engineering, LLC
9047 Fallswood Lane
Brentwood, TN 37027
(615) 500-4242

mgoslak@thorengineer.com
www.ThorEngineer.com

Electrical One-Line Drawing

The most important part of having a safe reliable electrical system is having a well documented system on paper. We will walk-down your entire electrical system, collecting data that we will then use to create detailed Electrical One-Line (Single-Line) Diagrams that allow your maintenance personnel to quickly and accurately identify circuits.

Load Study

After a plant has been operating for many years, equipment gets added, relocated or deleted without updating the electrical drawings. It may be impossible to know for sure what the real electrical load is on any given circuit from the obsolete drawings. In a Load Study, we actually put a data-logging current meter on each of your feeders and measure peak currents for a specified period. This gives you a complete load profile. Having the load profile allows you to add/move loads without worrying about overloading a particular circuit. It also allows us to fine tune circuit breaker settings and fuse sizes to achieve a more selectively coordinated system which makes your system much more reliable.

Short Circuit Study

When a plant is originally designed, the engineer specifies switchboards, circuit breakers and fuses with manufacturer's short circuit ratings high enough for the maximum available fault current in your plant. As motors are added over the years, transformers are replaced or increased in size or the Utility Company increases its service, the available fault current in your plant increases. It is possible that the original equipment is no longer adequately rated for the current available fault current. A short circuit Analysis will calculate the maximum available fault current in your plant and compare this to the ratings of your electrical equipment. We will identify deficiencies and recommend solutions.

Coordination Study

A reliable plant is one that is designed to be "Selectively Coordinated". This means that when there is a short in the electrical system, the nearest upstream overcurrent device (i.e. circuit breaker or fuse) trips first. For example, you do NOT want a short in a toaster in the break room to cause a black out to the entire plant. In a Coordination Study, we collect nameplate data on all the major circuit breakers, fuses and other protective devices in your plant. We check to see if feeder cables and transformers and panelboards are adequately protected with the existing overcurrent protective devices. We then check that the existing devices are selectively coordinated. If they are not, then we make recommendations to correct the deficiencies. Some of the recommendations are installation of new fuses, or adjustment to circuit breaker trip settings. We will make the adjustments on-site to your circuit breakers when needed.

Arc Flash Hazard Analysis

NFPA 70E addresses energized work on electrical equipment. One of the hazards of working on energized equipment is Arc Flash. An Arc Flash is an explosion caused when a high resistance short circuit is initiated. The explosion can cause devastating burns, hearing loss and impalement from shrapnel release. An Arc Flash Hazard Analysis can easily be combined with the Short Circuit Study (it is just one additional step). The Arc Flash Hazard Analysis will identify the hazards in your plant, and the appropriate PPE to be worn by your employees. We always make recommendations to reduce Arc Flash Hazards in your plant. We try to lower Arc Flash Hazards to lowest possible level by making adjustments to adjustable trip circuit breakers and/or by changing out fuse size/types.

Harmonic Analysis/Power Factor Correction

Harmonics are always present in an electrical system. They are generated by high frequency switching devices like power supplies, and variable frequency drives. Excessive harmonics can cause power quality issues like overheating, and nuisance tripping. We will determine total harmonic distortion (THD) at key points in your electrical system and compare these against limits set forth in IEEE 519. We will make recommendations to improve the THD levels in your plant by recommending hardware solutions such as modifications/additions to power factor correction capacitors, and installation of filters and drive isolation transformers (to name a few solutions). We use a Fluke 435 data-logging meter to capture the THD levels in your plant to verify the effectiveness of our solution.

Licensed Professional Engineers in multiple states.