



ELECTRICAL SYSTEM PLANNING

DESIGNED TO HELP YOUR COMMUNITY SUCCEED

“Enhancing economic development through infrastructure”

Why you should choose **SPECTRUM** for ...

System Studies

As an integral part of planning your system operations and growth, any weaknesses that exist need to be identified and mitigated. The only cost-effective way is to study your electrical system utilizing sophisticated software models.

With extensive operating knowledge, the professional engineers at Spectrum Engineering have the ability to gather critical information about your electrical system, properly input that information into E-Tap, ASPEN, and EDSA Power System Analysis Software, and analyze the data. Spectrum then recommends which areas need immediate attention and offers a plan to address other areas likely to need attention in the future.

Our comprehensive general system studies include:

- Short circuit analysis
- Protective device coordination
- Loading
- Load flow analysis
- Fault current (arc flash)

The results will provide a detailed comparison of system losses with the existing versus converted circuitry, with the output providing a detailed cost savings analysis of system upgrades.

Specifically, Spectrum's power system analysis studies encompass:

- complete data collection services
- data input and complete system modeling in the appropriate modeling software
- short circuit, load flow, and arc flash data analysis with the identification of multiple contingencies
- a detailed assessment of upgrade recommendations, including specific cost/benefit data used in establishing a prioritized list of improvements
- an analysis of your system with respect to the overall power system plan and the economic development of your geographic area

Why Arc Flash Hazard Assessments?

The National Electric Safety Code (NESC) now requires utility managers to conduct Arc Flash Hazard assessments to determine potential exposure to an electric arc for employees who work on or near energized parts or equipment. The Occupational Safety and Health Administration (OSHA) requires employers to give a reasonable estimate of the heat energy that an employee might be exposed to during an arc fault.



Spectrum
ENGINEERING CORPORATION

Contact Rod Sibery | Phone: 260-627-8888 | RSibery@SpectrumEng.com

5524 North County Line Road | Auburn, IN 46706 | www.SpectrumEng.com

Customer Name	<u>VILLAGE OF MONTPELIER</u>		
	CONTACT Pam Lucas, Village Manager (419) 485-5543 plucas@montpelieroh.org		
Customer Type	Municipality		
Contract Start/Finish	Several Stages beginning in December 2008 with project completion in May 2009.		
Project Size	<ul style="list-style-type: none"> • Entire municipal system • 12.47 kV distribution circuits • 4 kV distribution circuits 		
Scope	<ul style="list-style-type: none"> • Create ETAP system model • Interview Montpelier Electric on existing and future operational plans • Perform load flow, short circuit and device coordination activities in the ETAP model • Develop conclusions for fault current (Arc Flash), system improvements and define need, scope and method of improvement implementation 		

A complete and thorough System Study should provide utility managers with a solid roadmap to the future. This would involve a detailed assessment of upgrade recommendations, including specific cost-benefit data used in establishing the prioritized list of improvements. It is with this focus that Spectrum approaches this type of study, with the clear outcome being a step-by-step chronology of if/when the recommended changes should be made.

The Village of Montpelier, Ohio considered the value of replacing its remaining 4.16kV circuitry with 12.47kV. Critical to the justification was the payback period, which was based on modeling Montpelier's primary load (three-phase) system. The data gathered during the system assessment, coupled with system losses, loading data and supply cost data, all factored into the system models. Spectrum Engineering uses robust software to model a system, given a range of measurement parameters, with the outcome providing Montpelier with a five- and ten-year plan for managing its electrical distribution plant.

Spectrum performed a comprehensive general system study incorporating short circuit, protective devices, loading, load flow and planning by modeling Montpelier's three-phase distribution system.

- Prepared and provided analysis to an N-1 level of contingency under the following scenarios
 - Converting portions of 4kV system to 12kV
 - Converting all remaining 4kV to 12kV
 - No conversions
- Determined costs associated with each of the recommended improvements
- Evaluated the addition of a new substation and its placement with the system relative to reliability, loads and cost/benefit factors
- Evaluated timing associated with each system upgrade factoring in payback period and reliability requirements
- Developed comprehensive set of recommendations designed to provide a near term (five-year) and long term (ten-year) roadmap
- Prepared and distributed a complete written report of the findings and recommendations
- Presented conclusions and recommendations to Montpelier management and staff

