



ELECTRICAL SYSTEM PLANNING

DESIGNED TO HELP YOUR COMMUNITY SUCCEED

“Enhancing economic development through infrastructure”

Why choose **SPECTRUM** for ...

Substation Maintenance

Municipalities, universities, rural electric cooperatives, and industries that own and operate their own utilities know that maintenance and repair are vital to providing reliable, low-cost power to customers. Spectrum is available for the maintenance and repair of substation equipment.

Spectrum’s complete substation maintenance and repair services include:

- Overall electric power substation inspection
- Thorough cleaning of each device and electrical system
- Troubleshooting of any equipment operation
- Mechanical and electrical testing of all substation apparatus
- Design modifications required for equipment replacement
- Electrical wiring replacement
- Testing of any substation relay for proper operation
- Verification of protective device coordination
- Complete relay system upgrades
- Full testing and commissioning
- Complete test reporting

Spectrum’s current test equipment used during substation maintenance and repair includes:

- Megger PF Tester, Capacitance & D.F. Bridge

- General Radio Megohmmeter
- Biddle Instruments Low Resistance Ohmmeter (DLRO)
- Megger Ground Test Set, Earth Tester
- AEMC Instruments Ground Tester
- Schweitzer Electronic Time Travel Tester

- Doble Relay Test Set
- Megger Transformer Turn-Ratio Test Set
- EIL Instruments Protective Relay Test Set

Any maintenance and/or repair project generally follows a process which includes:

- Meeting with the utility owner to discuss what maintenance or repair is needed
- Providing a written document of work
- Scheduling outage times
- Cleaning, maintenance and testing on all equipment
- Discussing repairs with owner, if damage is found
- Repairing any damaged equipment, if possible
- Providing a list of parts required to repair damaged equipment that cannot be repaired during the outage
- Documenting all cleaning, maintenance, testing and repair results on test record sheets
- Turning equipment back to owner
- Providing complete test report with all documents including a written report indicating the health of each piece of substation equipment



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

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Customer Name	Trinity Substation Maintenance	
	JAY COUNTY REMC	
	CONTACT Jeff Myers, Assistant Operations Superintendent 260.726.7121 myersj@jayremc.com	
Customer Type	REMC	
Contract Start/ Finish	January 2012	
Project Size	\$5,000	
Scope	<ul style="list-style-type: none"> • Substation inspections • Testing on the power transformer and three step voltage regulators • All equipment inspected, cleaned and tested • Perform analyses and present results and recommendations to Jay County REMC 	

Spectrum Engineering completed substation inspections and testing on the power transformer and three step voltage regulators at the Trinity Substation. Work began when clearances were verified after Jay County REMC personnel completed switching and Spectrum personnel installed grounds.

All equipment was disconnected, inspected, cleaned, and tested. Oil samples were also taken from all units being tested. The perimeter fence and fence grounds were visually inspected.

Testing Procedures

5 MVA Power Transformer

Inspection and maintenance procedures included recording current and peak oil temperatures, pressures and compartment levels, while looking for abnormal conditions, alarm limits that have been met, and fluid leads and/or weeps. The bushings and arresters were solvent cleaned. High side bushings, arresters and transformer windings were Power Factor tested using the Megger DB100 Power Factor Test Set. The windings were also ratio tested on each no-load tap.

Regulators

The regulators were disconnected and the insulators were solvent cleaned. The dissipation factor was determined by using the Olman Power Factor Test Set. The turns ratio test was determined by the Megger TTR310.

Switches

The switches were tested using the Biddle Digital Low Resistance Ohmmeter (DLRO) test set.

Oil Samples

The porcelain insulators were first thoroughly solvent-cleaned. The contact resistance reading was determined by using the Biddle DLRO.

The leads were disconnected from the circuit switcher next. The Olman Power Factor Test Set determined the dissipation factor of the primary insulation. The Glassman High Voltage Hipot also tested the primary circuit insulation.

A final report, including a description of test procedures followed by findings and recommendations, and test results were submitted to the client at the end of the project.



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