



MITIGATE HARMONIC DISTORTION AND BRING HARMONY TO YOUR WIND OR SOLAR FARM.

Harmonic distortion may sound like an oxymoron, but it's a real and growing concern for developers and owners of grid-connected solar and wind power generation projects. In fact, harmonic voltage and current distortion caused by the external system or internal equipment can wreak havoc within a renewables project's collection and substation equipment.

There are two critical times when developers and power generation owners need to be concerned about harmonic distortion: when the project has been built, and when issues are detected. To protect power generation systems from power quality issues, utility system operators are conducting more testing and analyses of harmonic current and voltage distortion impacts produced by solar, wind, and storage facilities.

HIGH-VOLTAGE EXPERTISE

At Ulteig, we've recognized the issue of harmonics for many years. That's why we've built a team of harmonics experts who help developers and asset owners prevent and correct unwanted contributions of harmonic distortion into the grid. For a complete harmonic analysis of a generating facility, Ulteig recommends a three-step approach, which includes:

1 HARMONICS TESTING PLAN

2 DATA COLLECTION

3 POWER QUALITY ANALYSIS

BETTER PROCESS. BETTER POWER QUALITY.

While harmonics analyses are typically conducted after harmonic distortion issues are already an issue, we recommend building it into the early-stage design and planning phase of your project. Harmonic distortion can cause serious damage to your system and lead to unwanted downtime. We take a thorough approach to help our clients avoid more expensive problems in the future. It involves these steps:

1.) HARMONICS TESTING PLAN

- Review client data: Review interconnection diagrams, facility designs and ratings and previous equipment failures or switching events.
- Develop a plan to monitor specific locations in which to place specialized temporary power quality meters.

2.) DATA COLLECTION

- Establish a baseline for data collection.
- Continue during commissioning and energization activities.
- Complete data collection after full commercial operation.

3.) POWER QUALITY ANALYSIS

- Collect harmonic data: Collect and analyze harmonic data and the power quality of the system.
- Create a mitigation plan: Mitigate harmonics issues; create plan for short- and long-term maintenance to avoid future issues.



HARMONICS TEAM AT ULTEIG

Ulteig has a team of experts available to perform harmonic analysis. In addition to harmonics analysis, Ulteig offers other optional services such as system modeling, harmonic filter design, preliminary evaluation of tested data to identify the potential for harmonic issues, and support services.

Our team is led by: **Tahnee Miller, Technical Manager | 701.280.8517 | tahnee.miller@ulteig.com**

Tahnee Miller is the Senior Studies Engineer. She specializes in electrical system studies, including arc flash studies, reactive power studies, fault current studies, and harmonic studies for distribution systems, substations, and transmission lines. Her team conducts electrical system modeling, complete system analysis, study documentation preparation, and client communication of results and recommendations. In 2018 she was selected as one of Midwest Energy News' 40 Under 40, a program that recognizes emerging thought leaders and their work in aiding America's transition to a clean energy economy.

CONTACT US ABOUT YOUR NEXT PROJECT

To learn more about Harmonics at Ulteig, visit Ulteig.com.

ABOUT ULTEIG

Ulteig delivers comprehensive design engineering, environmental planning and solutions, program management and technical and field services that strengthen infrastructure vital to everyday life. Ulteig connects people and resources to develop compelling, integrated solutions across multiple Lifeline Sectors®, including power, renewables, transportation and water. Ulteig's footprint spans the country and leverages its expertise with a wide range of public and private clients. Learn more at ulteig.com.



We listen. We solve.™