RLC ENGINEERING

CASE STUDY

Collaborative DTT Deviation: Refining Interconnection Screening with EMT Modeling

OVERVIEW

A 4.80 MW Distributed Energy Resource (DER) project in New Orleans was identified through initial screening as potentially requiring Direct Transfer Trip (DTT) protection due to concerns related to unintentional islanding and transmission overvoltage. The associated fiber DTT requirement would have added approximately $1 million in additional upgrade costs to the project.

Rather than challenging the screening outcome, RLC Engineering worked collaboratively with the developer and utility to conduct a detailed EMT-based DTT Deviation Study using PSCAD. The refined analysis demonstrated that the project did not present a credible islanding or transmission overvoltage risk. Based on these results, the utility granted a DTT deviation maintaining protection objectives while avoiding significant upgrade costs and supporting a more data-driven approach to interconnection review.

THE APPROACH

- Reviewed the screening-based DTT requirement and identified areas where a more detailed, physics-based evaluation could provide additional insight.
- Coordinated closely with the utility and developer to collect transmission, distribution, substation, and inverter modeling data.
- Developed an integrated EMT model in PSCAD and performed Risk of Islanding (ROI), Load Rejection Overvoltage (LROV), Ground Fault Overvoltage (GFOV), and Coefficient of Grounding (COG) analyses under multiple islanding and fault scenarios.
- Evaluated performance against IEEE 1547-2018 to ensure continued compliance and protection integrity.
- Documented results transparently and supported utility review and technical validation.

THE CONCLUSION

The EMT-based evaluation provided a more granular understanding of actual system behavior than screening-level analysis alone. The results demonstrated that DTT protection was not required to maintain system reliability and protection objectives.

The utility granted a DTT deviation, enabling the developer to avoid approximately $1 million in upgrade costs while preserving utility protection standards. The outcome illustrates how collaborative, data-driven analysis can align developer cost efficiency with utility reliability goals, supporting modernization of screening practices without compromising system safety.