National Institute of Technology Rourkela

Departmental Seminar

Seminar Title	: Fault Localization in Multi-Terminal Radial Distribution Systems Using Synchronized Measurements
Speaker	: Abhilash Asit Kumar Majhi (523ee1002)
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Venue	: Seminar Room (EE-205)
Date and Time	: 21 Jul 2025 (5:00 PM)
Abstract	: Efficient fault location in electric power systems is necessary for ensuring grid reliability, minimizing downtime, and facilitating timely restoration efforts. This paper presents a novel fault localization methodology tailored for multi-terminal distribution systems, a critical domain in power system analysis. Leveraging synchronized data from Phasor Measurement Units, the proposed approach integrates two-ended impedance based technique with Kirchhoff's Voltage Law (KVL) principle to accurately pinpoint fault locations. By incorporating line heterogeneity and load currents, the methodology achieves robust fault detection and localization, thus addressing the challenges posed by real-world distribution network configurations. Extensive simulation studies conducted on the IEEE 33 bus system using MATLAB/Simulink demonstrate the efficacy and versatility of the proposed methodology across diverse operational scenarios. The findings underscore its potential to significantly enhance fault location capabilities in distribution systems, thereby contributing to the reliability and resilience of modern power grids.