

# Transmission Line Differential Protection Based on Microprocessor Relays

Saeed Roostae\*, Mini Shaji Thomas, Shabana Mehruz

Departement of Electrical Engineering, Jamia Millia Islamia, New Delhi, India

\*Corresponding author Email: saeed61850@yahoo.com

Nowadays, in digital substation, lots of new technologies such as microprocessor relays and communication technology bring lot of advantages for protection functions. Differential protection plays a very important role because of absolute selectivity for isolating the faulty part. This paper reviews transmission line differential protection based on microprocessor relays.

**Purpose:** line differential protection function is one of the most important protection of transmission lines which should issue trip signal without any delay in case of any faults in transmission lines. Use of microprocessor relay as line differential relay has many advantages.

**Methods:** line differential protection based on IEC 61850 is presented in [1]. In [2] an adaptive current line differential protection scheme is proposed to improve the dependability and security. Wide area differential protection based on IEC 61850 is presented in [3].

**Results:** The most important advantage of transmission line differential protection function is unaffected to external faults [4-6]. Communication and Charging Current are the most important problems in line differential protection.

**Conclusion:** In line differential protection, the relays in both ends have to exchange data via communication channel and compare the currents. Based on the function on the microprocessor relay, the relay issues the trip signal in case of any fault in the line.

**Keywords:** line differential protection, microprocessor relay, line protection, line differential relay

## References:

1. Yiqing, L., et al. A design scheme of line current differential protection based on IEC 61850. in Power Engineering and Automation Conference (PEAM), 2011 IEEE. 2011.
2. Dambhare, S., S.A. Soman, and M.C. Chandorkar, Adaptive Current Differential Protection Schemes for Transmission-Line Protection. Power Delivery, IEEE Transactions on, 2009. 24(4): p. 1832-1841.
3. Yangguang, W., et al. Development of wide area current differential protection IED based on IEC 61850. in Transmission and Distribution Conference and Exposition, 2008. T&#x0026; D. IEEE/PES. 2008.
4. Sinclair, A., et al., Distance Protection in Distribution Systems: How It Assists with Integrating Distributed Resources. Industry Applications, IEEE Transactions on, 2014. 50(3): p. 2186-2196.
5. Hashemi, S.M., M.T. Hagh, and H. Seyedi, A Novel Backup Distance Protection Scheme for Series-Compensated Transmission Lines. Power Delivery, IEEE Transactions on, 2014. 29(2): p. 699-707.
6. Mukerjee, R.N. and M.F. Bin Abdullah, Under-Reach Correction in Twin Circuits Without Residual Current Input from the Parallel Line. Power Delivery, IEEE Transactions on, 2008. 23(3): p. 1359-1365.