

## **Index-based placement and distributed generation sizing based on heuristic search**

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### **ABSTRACT**

Transmission loss, voltage regulation and voltage drop are three main issues in distribution system. In recent years, distributed generations (DG) installation approaches have been addressed widely in many parts of the world. Depending on their operating characteristics and location, DG can significantly affect the power losses and voltage profile in distribution system. Thus, prior to the installation of DG into a system, offline study is a priori so that under-compensation and over-compensation can be avoided. This paper presents a method for DG placement based on a voltage stability index, while its sizing is optimally identified using an optimization technique in order to minimize power losses in the distribution system. The proposed technique was tested on an IEEE 10 radial distribution system. As for the DG sizing, an optimization technique based on approximate method (AM) is used and indicated promising results.

### **KEYWORDS:**

Distributed Generation, DG Location, DG Sizing, Voltage Stability Index, Power Losses

## REFERENCES

1. S. Devender, R.K. Misra and S. Deependra, 'Effect of Load Models in Distributed Generation Planning', IEEE Transaction on Power Systems, vol. 22, no.4, Nov 2007.
2. V. H. Mendez, J. Rivier, J.I. de la Fuente, T. Gomez, J. Marin and A. Madurga, 'Impact of Distributed Generation on Distribution Investment Deferral,' International Journal of Electrical Power & Energy Systems 28, Vol. 28, Issue 4, pp.244-252, May 2006.
3. T. Ackermann, G. Andersson and L. Soder, 'Distributed generation: a definition', Electric Power Systems Research 57, pp.195–204, 2001.
4. D. Gautam and N. Mithulananthan, 'Optimal DG Placement in Deregulated Electricity Market,' Electric Power Systems Research, Vol. 77, Issue 12, pp.1627-1636, Oct. 2007.
5. M. Sedighzadeh, A. Rezazadeh, 'Using Genetic Algorithm for Distributed Generation Allocation to Reduce Losses and Improve Voltage Profile,' in Proceedings of World Academy and Science Conference on Engineering and Technology, vol. 27, Feb.2008.