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64565	International journal of microbiological research	UNIV	Science	International Digital Organization for Scientific Information (IDOSI)		20792093	U.A.E.
64575	International Journal on Information	UNIV	Science	Praise Worthy Prize	22812911	22812954	United States

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Situation Analysis of Load Shedding and its Effectiveness in the Area of Power System Security

Raghu.C.N[1], G.Raghavendra[2], Doddabasappa N[3], Anil Kumar D B[4]

[1,2,3,4]Assistant Professor, School of Electrical and Electronics Engineering, REVA University, Bengaluru, Karnataka-560064, India.

Abstract

With the hasty growth of the power system to impact increased consumer demand and with more inflexible economic and ecological boundaries, power systems become more composite and severely stressed. Subsequently, system extensive disturbances which lead to the disturbance of voltage and frequency stability which is a critical threat to the power system security. The frequency and voltage instability may lead to the blackout and severely damages the power system gadgets. This upturns the significance of instigating a protection scheme that conserves the system stability. The ultimate procedure prevents the occurrence of a system collapse incident is the functioning of a load shedding scheme. These paper emphases on the overview of the UFLS and UVLS scheme. This paper performs the situational analysis of the existing load shedding scheme. And reassessments some of the frequently adopted techniques along with the brief discussion of the existing scheme to extract the research gap in this area. The outcome of the review will assist the researcher to have a greater visualization of the contribution of the earlier studies.

Keywords: Under voltage load shedding, Under frequency load shedding, power system blackout

INTRODUCTION

In the area of power security, load shedding plays a vital role to captivate the dynamic power requirements of the customers. When all fundamental controls are vulnerable to preserve the power system security operation during a disturbance or contingency, load shedding will be used as the last procedure to make the loss of blackout minimum [1]. The core objective of an effective LS scheme is to curtail a lowermost number of loads and deliver a rapid, steady, and safe transferal of the system from an emergency situation to a normal stability state 2]. The Power system reaches to emergency state at the moment of an unexpected increase of system load, the unanticipated outage of the transmission line or generator or malfunction in any of the power system constituents. This disturbance may result in some problems alike line overloading, under frequency, voltage collapse, and angle insecurity. The disturbances in the power system differ in magnitude and will cause the instability of the power system. This needs, the stability condition of the system must be reviewed and forecast to avoid such incidences. The prominence of stabilizing electric power system equilibrium and consistency has encouraged the evolving of novel methods to capitalize the system stability. The main issues in load shedding are the location of load shedding, amount of shedding load, and time of load shedding. Consequently to avoid post contingency problems, detecting the location of the buses for load shedding must be determined based upon the load significance, curtailment cost and the distance of the curtailed load to the contingency location[3].

Basically, the load shedding scheme is categorized into Under frequency Load shedding (UFLS) and Under voltage load shedding (UVLS). As previously stated, when a power system distraction creates active power imbalance, consequential causes in a frequency deterioration and emergency action such as UFLS may be enforced. If system frequency decline further than the given threshold, for a short amount of time, power stations may trip off causing additional load imbalance which may lead to a power system collapse [4,5]. To prevent massive voltage collapse due to the occurrence of desperate inadequacy in reactive power reserves, power utilities designate Under voltage load shedding(UVLS) because it is an economical procedure to accomplish voltage stability.[6]

The load-shedding schemes proposed by many researchers can be categorized into three groups.

- **A fixed amount of load shed:** The number of loads to be shed is fixed earlier. This group uses time simulation analysis to determine the minimum amount of load shed using dynamic parameters. The shortcoming of such group is time-consuming and in addition incorporating optimization technique in time domain analysis.

- **Dynamic features:** In this group minimum load, to be shed is determined by using load dynamic parameters, tries to determine a minimum load for shedding by estimating dynamic load parameters. This procedure is, results are extremely vulnerable to dynamic load model parameters.

- **Optimal power-flow equation**: Lastly, in this group, minimum load shedding is fixed using optimal power-flow equations by employing the static model of the power system. The dynamics associated with voltage stability are often slow, and hence static approaches may represent a good approximation. The preliminary idea of this method is to establish a sensible solution to the power-flow equations. [7,8]

This paper, therefore, discusses various traits of the DG system with special emphasis on the research contribution in the same topic. The primary aim of this paper is to find the effectiveness of the available research contribution and elicit significant open issues and research gap at the end of the discussion. Section II of this paper discusses the significance of the distributed generation followed by a brief discussion of