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ABSTRACT

Forecasting is the process of making statements about events whose actual outcomes have not yet been observed. Forecasting can be broadly considered as a method or a technique for estimating and planning future aspects of a business or other operation.

Considering a decision on building a new power plant, forecast concerning future demand, technological innovations, cost, competitors' plans, labor, legislation, and many other factors are needed to be known, which ultimately require some sort of forecasting.

Besides, the emphasis of the government is on developing and creating additional infrastructure in the country at village, town, city and metropolitan cities in a big way to make the life of common man comfortable. These initiatives may not be envisaged effectively without the availability of required electrical energy. The energy requirements are associated with every infrastructural development. Therefore, to search out better techniques / methods for estimating / forecasting / the energy requirements have always been considered as one of the prime objectives of policy makers of the country for the implementation of five year plans. There exist some methods which could be effectively used to face the future needs of electricity requirement.

Demand forecasting is considered as one of the critical factors for economic

operation of power systems. Forecasting of future electricity demand is also important for network planning, infrastructure development and so on. However, power system demand forecasting is a two dimensional (2D) concept: consumer based forecasting and utility based forecasting. Thus the significance of each forecast could be handled separately. Consumer based forecasts are used to provide some guidelines to optimize network planning and investments, better manage risk and reduce operational costs. In basic operations for a power generation plant, forecasts are needed to assist planners in making strategic decisions with regards to unit commitment, hydro-thermal co-ordination, interchange evaluation, and security assessments and so on. This type of forecast deals with the total power system loads at a given time, and is normally performed by utility companies. Nevertheless, power system demand forecasting can be classified in three categories, namely Short-term, medium term and long term forecasting. These forecasts are often needed for day by day economic operations of power generation plants. Medium-term demand forecasting deals with predictions ranging from weeks to a year. Outage scheduling and maintenance of plants and networks are often roofed in these types of forecasts. Long term forecasting on the other hand deals with forecasts longer than a year. It is primarily intended for capacity expansion plans, capital investments, and corporate budgeting. These types of forecasts are often complex in nature due to future uncertainties such as political factors, economic situation, per capital growth etc. Planning of new and extensions to existing power system networks for both the utility and consumer require long-term forecasts. A poor demand forecast misleads planners and often results in wrong and expensive expansion plans.

One of the convincing ways to predict demands that are known to be varying continuously on Long term basis is to rather minimize load sampling points to monthly or weekly basis.

The most popular techniques used for demand forecasting are time series based models, similar-day approach and intelligent system based models. Some of the conventional

forecasting methods have major drawbacks especially their inability to map the non-linear characteristic of the load, thus a substitute of classical methods with intelligent system based models is to a great extent essential. Most forecasting models use statistical techniques or artificial intelligence algorithms such as regression, neural networks, fuzzy logic, expert systems and Genetic Algorithm (GA).

The fuzzy time series model and Genetic Algorithm based models are designed and developed in the lab using MATLAB. The results of the demand forecast using both model has been compared.