

REVIEW OF TRANSMISSION PLANNING APPROACHES IN RESTRUCTURED POWER SYSTEMS

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ABSTRACT:

In today's electric market scenario every country state electricity board has gone for restructuring or more popularly it is termed as deregulated environment of power system. Indian state electricity board has also adopted this newly formed electric market scheme, and divided in generation, transmission and distribution utility. Particularly in this paper transmission system planning in deregulated environment is review from different internationally recognized papers.

KEYWORDS: Power system deregulation, transmission planning etc.

INTRODUCTION:

In nineties era, all electric utility companies across the world has gone for change in mode for operation across the world. The change was from vertically system of integration it has adopted a open market systems. The exact change reason cannot be noticed as it varies region to region. In the developing countries the major issue observed is demand of electricity is pretty high and inappropriate management of power, it leaded to unfair tariff policies. This scenario may affect the financial planning of electric utility company and no funds will be available for improving or adding generation capacity to the system. In the advanced countries, the scenario in totally different the major focus is on the providing the electricity at a lower prices.

Regulation: Regulation means that the government has set down laws and rules that put limits on and define how a particular industry or company can operate.

Deregulation: Deregulation in the power industry is restructuring of the rules and economic incentives that government set up to control and drive the electric power industry.

WHY DEREGULATION:

There are various reasons that led to deregulation, author has tried to list few major reasons, that are as follows:

1. The need for deregulation changed:

The basic reasons for moving from regulated to deregulated market are all the need of regulation has become very old to follow in 21st century.

2. Privatization:

The basic understanding across the world is private entity would do more justice to work rather than government entity and it is more prominent in Indian context. But, In case of deregulation of electric industry deregulation only means to opt for privatization. In various states across India, state electricity board is been divided in three entities and privatization or rules of deregulated market are applied.

3. Decrease in running cost:

It is obvious that, if the competition increases it will lead to competitors will bring more and more innovations and lowering of operation cost.

4. Improved focus on customer requirements:

It was a monopoly of state electricity board, so they had least botheration on the customer requirements, although it was their duty to supply all customers. This focus has lost the pro activeness in fulfilling the needs of customers.

Few other reasons for supporting deregulation are listed below

1. Global economic crisis
2. Alteration in ideological and political policies
3. Overstaffing in state electricity board
4. Challenging environment issues

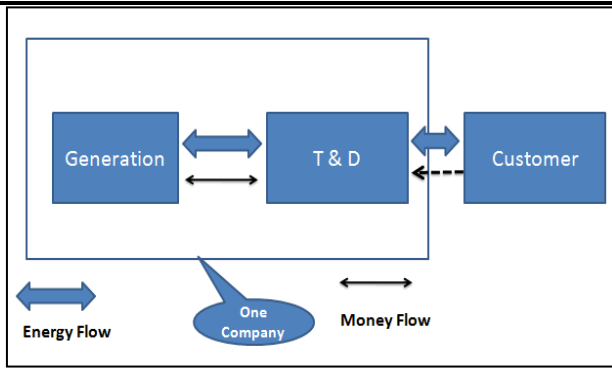


Fig. 1. Structure of regulated industry

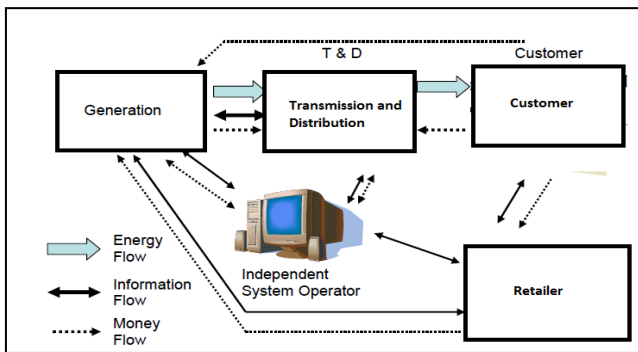


Figure 2. Structure of deregulated industry

DIFFERENT ENTITIES IN DEREGULATED ENVIORNMENT:

1. Genco (Generating Company): As a source of energy, Genco becomes owner operator of the system. Genco may own one or more generating stations. Generating stations as independent authority bids the power in grid at a competitive rate.

2. Transco (Transmission Company): Transco acts as a delivery medium and it transfers power from generating end to distribution company or at the customer end in few cases. The role of transmission company is to own and facilitate transmission of the power. In various deregulated industry structures the transmission company maintains healthy environment of power transfer and it acts as a monopoly of franchise. Operations of the transmission lines are not govern by the transco company but it looked by the independent system operator (ISO). The transmission company gets paid for utilizing its infra.

3. DISCO (Distribution Company): The role of distribution company is to look after local power delivery system. Disco takes charge of delivering power to businesses, homes and small scale industries. DISCO may buy the power from spot market or direct contracts with generation company to supply the power to customers.

4. RESCO (Retail Energy Service Company): As the name suggests it sells power in retail market. It may buy the power from directly generation company and sell customers. RESCO companies must be good in service to survive in this competitive market.

5. ISO (Independent System Operator): The ISO is a key player in the deregulated environment it may or may not have any generation or directly take part in electric trade bidding. Even if ISO is owning the generation it is only used a system reserve capacity or in extreme cases it is only used. The role of ISO is to keep system reliable and secure.

MARKET MODELS:

There are two major types of market model in deregulated electric industry

1. Pool Model:

Pool model is mainly adopted in UK, and it is also termed as monopsony model. In this model only one buyer is available to bid all the energy generated by the generator. Poolco has to play the role of system operator also as there is the only buyer or facilitator to transmit and distribute energy. In general all the generator companies will decide the generator cost curve and then go for auction mostly in day ahead market. In this auction poolco is the only company which buys the power and generator is the only company which sells the power.

2. Open Access Model:

The model is termed as nodal model and is mostly preferred and implemented long back in USA. In this kind of market auction of energy and day ahead or future markets is looked after by a separate entity named as power exchange. All the parameters of the system, in other words, the work of keeping the system reliable, efficient and in smooth operation is looked after by the independent system operator (ISO). ISO plays a vital role in this model, to provide a fair open access model to sellers and buyers.

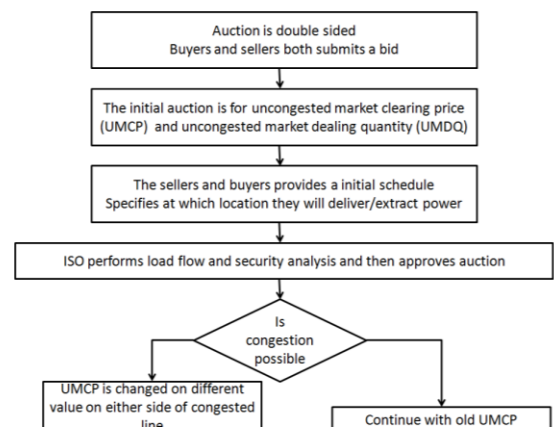


Fig. Flow of operation of power exchange

THE ELECTRICITY ACT 2003

The conceptual framework for this legislation to open electricity market open for competition. The act move forward and talks about market based regime in electric energy sector. The act also rationalizes, updates and consolidates the laws of generation, transmission and distribution. It mainly focuses on following points

1. To create competition in energy sector
2. consumer focussed operation
3. availability of supply
4. rationalization of tariff
5. decreasing the cross subsidization levels.

CONCLUSION:

In this paper author has tried to review all the basics pertaining towards the deregualted energy sector. Author has also taken effort to put two different models of energy adoped by developed countries e.g UK and USA. In both the countries power is surplus than the demand. In State of Maharashtra power has to be buy from the open market. Although the situation is fairly enough as the solar energy over the last five years has shaped electricity market and bridged electricity demand to a greate extent, Innovation of LED lighting technology has also contributed to this.

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