

THE CHALLENGE OF POWER SUPPLY IN PEOPLE'S ERA

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The role of electricity in modern times is pivotal for progress in industrial, agricultural, commercial and social fields. Nations who have made material progress, always kept electricity of topmost significance in the development activity. Lenin's saying that communism means people's rule and electrification of the entire country is at least a pointer to the basic importance of power supply in a modern state. In economic terms, the per capita consumption in any country becomes the true index of economic progress and prosperity in any country, which unfortunately is only 16 units in our country and is perhaps lower than even some under-developed countries.

A good power supply system essentially conforms to the socio-economic needs of the area it is required to serve. An ideal supply system aims at providing best service to maximum people at the lowest costs. It must be tailored to have the following characteristics :—

- (a) Progressive Management System.
- (b) Sound Load Development Policy.
- (c) Continuity of Supply.
- (d) Rationalized tariff structure.

Before we examine our power supply system *vis-a-vis* the basic requirements, let us view some salient aspects of our economy as relevant to planning an efficient power system.

Economic Factors

Fundamentally, we have an agrarian economy where 80% of population is agriculturist. Agricultural produce is our main export item. Secondly, we need to set up more and more of capital goods industry to multiply GNP and increase our national wealth. The problem of low-productivity both in the industrial and agricultural sector is a paramount problem which we have to tackle on priority basis for economic survival. Likewise, the export promotion industries also rank in high priority to help boost our foreign exchange earnings. Another characteristic of our economy is the gross unemployment

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prevalent in the country. All these economic particulars have to be given due consideration while planning power system which has to be so designed and operated as to help industry and agriculture in appropriate priority. This is explained in the subsequent analysis:—

(A) Management System

The management system of a supply undertaking must be free from bureaucratic controls, red-tapism, and made output-oriented and having public accountability.

Gone are the days when bureaucratic system could suit a society. It can never work in today's democratic societies. A technical management with competent administrative background can alone manage a complex engineering system. Procedures laid should conform to broad objectives and have to be commercialized ones. Responsibility and authority must coincide at all levels. Division of responsibilities proves fatal for efficiency in the organization. The delegation of authority to various levels have to be made without undue centralization so as not to choke outputs. Too much tightening of controls results in lethargy, frustration and inefficient working which ultimately fails to meet requirements of consumers. For making the power utility set-up free from red-tapism, evolution of simple procedures and channels of action is imperative. The field units must be self-contained as far as possible. Even the auditors must be commercial ones instead of Government departments which are in a better position to appreciate the requirements of commercial working.

(B) Load Development

A power supply undertaking has two major responsibilities *i.e.* maintaining continuity of power supply and meeting new demands for power. Considering the latter function, it covers the following important steps :—

- (i) Load Forecasting.
- (ii) System Planning and Engineering.
- (iii) Arrangement of funds, material and T&P.
- (iv) Execution of works.

The first two steps require thinking at least ten years ahead with a scientific approach. The power market surveys should be accurate as far as possible even with the help of various agencies and outside the supply undertakings. The subsequent steps, of course, sometimes depend on economic factors beyond control even at national level and may upset schedules, as has been going on in our country. The aid-giving agencies may not fulfil commitments in-time for one reason or the other. This necessitates adoption of maximum potential of local resources in manufacture and engineering expertise etc., to

meet any challenge. The load development strategy should be in conformity with the priority of national importance, as suggested above.

Another aspect which needs to be kept in view is the special concession to be allowed to rural population, which is about 80% in the country. Keeping in view the widespread illiteracy among them, simpler procedures should be evolved for granting new connections, and more and more sub-offices need to be opened to take the supply undertaking at the doorstep of the village folk. Although we have achieved one of the highest load growth rates in the world (*i.e.* over 20%) and maintain high load factor (of the order of 85%), yet the load development policies have not catered the essential requirements of public welfare on the lines indicated above.

(C) Continuity of Supply

This is the second major responsibility of power supply concern. Efficiency in this operation is most desirable and can be best achieved by organizing self-contained and accountable field units with adequate delegation of powers. Proper communication facilities are a must for constant vigilance and reaction to system abnormalities. Regular preventive maintenance of the system on schedules is *sine qua non* to efficiency. More and more complaint offices for the general public especially in rural areas should be established so that villagers in scattered and far-flung areas do not face hardships. To make supply system efficient in rural areas, a network of radio, telephones etc. would facilitate the work. Sufficient transport facility is also a necessity.

A self-executing machinery for performance evaluation of personnel and technical investigations of system breakdowns are fundamental requirements. In addition to this, comprehensive personnel training is another important need of a supply undertaking. The staff should not only get extensive training in working techniques but also in public relationing and humanities to meet the challenge of changing times.

(D) Tariffs

Formulation of a national tariff structure has a direct bearing on the economic development effort. It serves as a general economic booster rather than an ordinary price structure of commodities. A careful study and appraisal of the different factors affecting the tariff system is imperative. The objectives need to be clearly set which have to be in consonance with the overall national economic policies.

Following broad factors affect the general tariff framework for a power supply system:—

1. *Fixed Costs* cover the capital outlay on various projects of generating, transmission and distribution which, *inter alia*, vary with the financial

efficiency involved in planning, designing and execution of the schemes. The costs also include those of other assets in the system.

2. *Operating Expenses* mainly include expenditure like those of the establishment, wages, fuel, interests, allowable rate of net return on investments, moratoria, taxes and other charges, debit servicing liabilities. Other elements affecting operating expenses are load factors and diversity factors, the rate of growth of consumption, and system losses, etc.

In addition to these financial factors, the tariff system also hinges on the general objectives set forth for a power supply system. Some of these may be listed below :

- (a) Meeting all costs incurred in the supply network and in addition securing sufficient reserves for future load growth.
- (b) Promoting maximum use of energy at the lowest costs consistent with the conditions imposed by demand.
- (c) Eliminating socio-economic disparities among various classes of consumers according to the national objectives.
- (d) Type of economy whether agrarian or industrial and the national economic policies.
- (e) Ensuring satisfaction of the consumers.

In view of our predominantly agrarian economy, serious economic disparities are very low per capita income. In the absence of utilization of local potential for various projects, the capital costs, in some cases, have been very high and have affected the tariff structure accordingly. Almost all the projects have been foreign-aided. A good load factor has, however, been maintained in the system which is about 85%. The annual rate of load development has been fantastic and is 21%. The load and energy patterns have been typical of developing systems. Generating is both thermal and hydel connected by a large inter-connected system. The losses in the system have been more than the international practice.

Tariff Structure.—Internationally, various types of tariff structures are in vogue. Summing up, they are listed below :

- (a) *One part tariff*—This includes various types like flat rate, fixed payment step tariff, block rate and load/rate tariffs.
- (b) *Two part tariff*.—It covers a fixed part and a variable portion.
- (c) *Three part tariff*.
- (d) *Multi-part tariff*.
- (e) *Special tariffs for large consumers*.

(f) Supplementary and standby tariffs.

In Pakistan, we have evolved (a), (b) & (e) types of tariff.

New Approach

In view of the new economic challenges, power tariff structure needs a new approach. Efforts can be made to reduce existing power rates by executing projects on self-reliant basis and with greater financial discipline, as well as by improving operational efficiency of power system. Foreign consultation must be done away with and our own men be got trained and utilized even in highly specialized fields where local talent is not available. In this connection, the past experience of nuclear generation at KANNUP has fetched relatively costly electricity (*i.e.* about 10 paise per unit) and future projects of atomic power generation need a careful review in the context of cheap electricity requirements of future. Similarly multi-part tariffs and standby tariffs need to be introduced for further improving load factors, diversity factors and encouraging private generation. For this purpose, correct priorities for the use of power may be laid in accordance with overall national economic policies. It may be in this manner :

- (i) Defence Production.
- (ii) Agricultural tubewells.
- (iii) Commercial consumers
- (iv) Domestic consumers.

The consumers using luxuriant appliances like air-conditioners, cooking ranges, space-heating and making other unproductive use of energy need to be heavily charged and discouraged.