

ELECTRICITY DISTRIBUTION - A GROWING INDUSTRY

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Introduction

First of all, let me thank the Institution of Engineers, Sri Lanka for inviting me to deliver the 1988 Prof. R.H. Paul Memorial Lecture and also thank everyone for your kind presence.

As one who received guidance and instructions from him I consider it a great honour to be able to speak today in honour of Prof. Paul, aptly described as the father of Electrical Engineering Education in this country. Robert Hoisington Paul had a brilliant academic record both at home and abroad and distinguished himself as the first Sri Lankan to obtain First Class Honours in the Mechanical Science Tripos at the University of Cambridge. Thereafter he completed an apprentice period at a leading Electrical Engineering Company - Metropolitan Vickers U.K. After his return in 1930 he decided to adopt engineering education as his career and has been responsible for the development of the Electrical Engineering Department of the Ceylon Technical College. Due to his untiring efforts he was also one who was largely responsible for obtaining the special facility for the Ceylon Technical College to be recognised as an institution capable of instruction leading up to the degree of BSc of the University of London.

Thereafter he took full responsibility as the Director of C.T.C. until he was appointed to the Chair of Electrical Engineering of the University of Ceylon.

He took a keen interest in the field of training of Electrical Engineers and devoted his entire career to it, until he retired from the University in 1968. He also continued to keep close touch with allied work during his retirement and his loss has been felt by all who knew him when he passed away in 1978.

It is most fitting that his devoted service in the field of Engineering Education be commemorated as we are doing today.

Please permit me to state a few experiences during my early days at the C.T.C. under Prof. Paul. The first year of engineering called 'Inter A' saw some 105 register for the course. This was at a time when there was no prospect of continuing higher education without proceeding abroad. Those who were successful in the London Matric Exam and those who could not enter other institutions found their way to the Ceylon Technical College. The majority of those who entered were compelled to leave in search of jobs, but until they left the sessions were rough. Prof. Paul was one who maintained good discipline and treated everyone alike and in a fair manner.

His keen interest and devotion to his work made him forgetful at times. He was the first to admit any such lapses. It is said that once when he was called to the Department of Education he went by car. Having finished

his business he returned to the College by Tram as he had forgotten the parking place. He was quick to admit the lapse.

He repeated what he believed as good advice all the time. One remembers his famous words in support of academic knowledge. "A person with a thorough knowledge of principles and adequate knowledge can be likened to a cat which is known to fall always on its feet even when it makes a wrong move".

The greatest honour that we can bestow on Prof. Paul is by applying the knowledge so gained so as to make life better for all our countrymen. If this is to be achieved we must endeavour to close such gaps that exist between knowledge and its application to everyday use. This brings before us a whole spectrum of activities which need close examination. Although certain boundaries may exist due to the necessity to breakdown the whole subject of Engineering into compartments one must not allow those boundaries to slowdown or block progress. Good engineering is based on sound knowledge at all levels whether it be highly academic aspect or a simple idea based on experience. The men & women who are needed to an organisation belong to various levels of knowledge and experience. Members of this institution are at the top of the pyramid of engineering. We need to realise that the knowledge and skills that our members possess are badly needed by a very large number of people who are outside this institution. If good engineering is to proceed with maximum benefit to all our people we need to be fully involved with all such activities.

The large annual increase in number

of consumers and the use of appliances has cast severe strains on the distribution systems generally. During peak times some consumers voltage is known to reach even 70 volts. The subject of Electricity distribution as seen by the average consumer is based on good availability (reliability) of the supply at the required voltage.

Regulations require the voltage level to be within + or - 6% of 230 volts for general distribution. Reliability has not been fixed by statute but every supply authority tries to keep its loss of supply to a minimum.

In developed countries such as the U.K. the non-availability of electricity is very low and can be expressed as one hour in a whole year. (When all interruptions are spread over all consumers). In our country this figure may run into days if areas outside Colombo are considered.

I am currently associated with Electricity Distribution involving the development and rehabilitation of electricity supply in Local Authority Areas.

The first project serving about 50,000 consumers, who can be described as urban and semi urban. The Asian Development Bank meets the whole of the foreign cost of Rs.280 million and Rs.90 million local costs. The balance met from local source is Rs.150 million. Even though it may have been convenient to make only one turn-key contract it was felt that several advantages would result if the work was broken up into several packages. Supply of foreign materials is made on international competitive bidding while supply of local equipment materials and manpower is from local contractors.

The experience gained in the first project has been very valuable. The second project has taken note of certain difficulties and adjustments are being made. In order to provide improved electricity supply to some 83,000 consumers and a further estimated 43,000 consumers to be connected in future under the second project, it is estimated that about 470 km of 11kV lines, 870 km of Low Voltage bundled conductor lines, 670 new transformer substations (total 84MVA) and 70,000 service connections will have to be constructed. This work content envisages local manufacture of concrete poles and aluminium conductors. There is a possibility that aerial bundled conductors may also be manufactured locally. Other items will be purchased through international competitive bidding (ICB). However, as per latest Asian Development Bank guidelines, local manufacturers/suppliers who intend to supply items under ICB could qualify for a 15% preference adjustment if the domestic value added equals at least 20% of the ex-factory price. Thus it will be seen that under this project there will be good opportunities for local entrepreneurs to contribute to the development of distribution supply industry in the Island. With further rehabilitation and/or expansion projects being undertaken by supply authorities these opportunities will continue to exist and may even increase.

I have taken this opportunity today to place before you some thoughts for the consideration of all members of this Institution. Electricity Distribution systems need large contributions from all fields of engineering, civil,

mechanical etc. For example Civil Engineers are needed to design the supports for transmission lines and substation equipment. Mechanical Engineers and Electronic Engineers also have their own part to play. Upto recent times the lack of continuous work due to intermittent nature of major development projects has prevented the formation of companies which can handle major contracts. Manufacturing capabilities and skilled manpower could not be supported due to the same reason. Contracts based on pre-qualification is not possible, award of contracts based on "good intentions" some times carry high risks.

Leaving the question of finance out, most failures can be attributed to lack of application of engineering knowledge skills and management. Taking note of the volume of work involved I am sure that members of this institution can evolve a formula to ensure that our engineers are made to set up new enterprises or assist existing ones so that this growing industry so vital to ensure a good electricity supply economically can be put on a firm foundation.

The amount of local expenditures that needs to be made to improve the electricity supply to 50% of existing consumers of electricity can be estimated at Rs.1500 million. In addition to there is a annual growth of new consumers estimated at Rs.250 million per year. This amounts to an expenditure of Rs.2500 million for the next 4 years.

So may I suggest that at least some of you join the entrepreneur ranks right away.