point of view

Doubling the Production Capacity of Paranthan Chemicals Corporation—Do we need foreign consultancy firms?

1. Does Sri Lanka need Foreign Consultancy Firms to develop its industry? The implementation of the 1st stage of the Paranthan Chemicals Corporation Expansion Project did not need any. It was done entirely by local personnel.

2. It is well known that foreign consultancy firms make most of their profit not through the selling price of machinery but in the provision of the so-called technical expertise. What is more valuable to us than the foreign Exchange saved this way, is the experience and the confidence gained by the local staff in providing this so-called technical expertise. How else could we gain such experience other than by actually handling a project?

3. The secret behind this achievement lies in the fact that the planning was done at grassroot level. Some technocrats with strings of qualifications behind their names would no doubt gaze in horror at such a statement. If Paranthan Chemicals has proved it, why should they gaze in horror? Let us see how this was done.

4. In 1970 Paranthan Chemicals was producing about 1,200 tons of caustic soda and 500 tons of liquid chlorine annually as its primary products and Hydrochloric Acid, Table Salt, Ferric Chloride, etc., as its secondary products. In its primary products it was not meeting the entire demand of the country. A projection of the demand pattern showed that there would be a considerable increase in the demand for caustic soda and chlorine specially with the commissioning of the new Textile and Paper Mills. It was, therefore, decided to double the production capacity of the Factory at Paranthan as the first stage. After this expansion the Factory would be producing 3,200 tons of caustic soda and 2,800 tons of chlorine annually.

5. Once the basic decision was made various planning committees consisting of Technical Staff Officers, Technical Supervisory Officers and Technicians as representatives of the Employees Council were appointed to go into various aspects of the project. For example, one Committee was responsible for the layout of the plant while another was responsible for services such as water, steam, etc. A Senior Technical Staff Officer co-ordinated the working of the Committees. These Committees were guided by the U.N. expert, Mr. J. D. Adhia, whose services were available to the Corporation, and by Dr. M. L.T. Kannangara, Senior Lecturer in Physics, University of Ceylon, Colombo Campus. Dr. Kannangara was then a member of the Board of Directors and played an important role in formulating policy on technical matters. At Board level various other local technical experts such as Dr. S. Gnanalingam of the C.I.S.I.R. were consulted.

6. Paranthan Chemicals is unique in many respects and especially with respect to its heart, the de Nora-de Roll Diaphragam Electrolytic Cell. This cell had been designed and fabricated in 1955 specially for Paranthan Chemicals. The original Consultants however, did not erect or commission the plant and bring it up to a commercially viable standard. The responsibility to commission the cells was thrust on the then inexperienced staff at Paranthan. They, with the able guidance of Dr. S. Gnanalingam put their shoulders to it and proved their capability. Should we discard this technical achievement of our personnel *or* go in for another cell such as the Mercury Cell or the Hooker Cell claimed to be superior to the de Nora-de Roll Cell? A foreign consultancy firm would no doubt have sold their technically sophisticated patent to us justifying on paper its supremacy. The story of the Paranthan Expansion would then have been different. But Paranthan Chemicals decided to double production by doubling the number of the same cells avoiding the importation of sophisticated technology.

7. The evaporator used to concentrate the weak solution of caustic soda obtained from the electrolytic cell was of the batch process type. The new one would be of the continuous process type. The technology would be different. But the staff at Paranthan would be able to handle it. The rectifier used to convert the Alternating Current of the National Grid to Direct Current as required for the electrolytic process could be similar to that of the old plant. The boiler used to produce steam which is in turn used in the evaporator could be similar to the one in existence. It was the same with the chlorine compressor. The indirect cooling type ammonia refrigerator of course would need modification to a direct cooling type which is more modern and more efficient. The electrical distribution scheme would need modification to cater to the increased demand.

8. The only major difference in the old and new plants would, therefore, be in the method of control While the old one was a manually controlled one the new one would be an automatic one with control by instruments to bring about the best efficiencies of modern design. In this manner the importation of sophisticated technology was kept to a bare minimum. Specifications were drawn up so that each item of plant could be purchased from a different

manufacturer and then integrated into one. In chemical plants the integration is simply done by pipes, valves and pumps or by switchgear and cables leaving a great deal of flexibility.

9. Quotations were duly called from worldwide sources in the middle of 1972 and selections made. However, the lack of a source of foreign exchange to finance the project necessitated re-thinking. After negotiating with the Overseas Development Administration (now O. D. Ministry) of the U.K. Government a soft loan of £360,000 (Rs. 5.676 millions) was obtained in early 1973. This was to be a government to government loan which was to be lent to the Corporation at an interest of 7.5% and a grace period of 3 years. Of the balance Rs. 6.645 million required for the project Rs. 4.386 million was given as a Government grant while the balance of Rs. 2.259 million was to be obtained as a loan from the Commercial Bank. With the total estimate at Rs. 12.321 million the doubled production would have brought in an incremental return of 18% and the Foreign Exchange payback period by import substitution would have been 2 years.

10. As per the conditions of the agreement with the O.D.A. quotations were called from British Manufacturers, in April 1973. Orders were duly placed in September/October. The Arab-Israel war and the oil crisis caused a serious set back to the project. The British Economy suffered heavily due to these and to other internal problems. Prices went soaring up and the delivery dates extended considerably. In some cases the prices went up to 300% and the delivery period up to 3 years. In fact several items have still not been received and the plant has been tested by substituting locally available mild steel pipes for stainless steel and nickel pipes yet to be received. Several orders had to be re-negotiated or cancelled. One of the important ones was that of the switchgear where the manufacturer defaulted.

11. A factor that helped in reviewing the target date for the completion of the project was the network drawn at the inception. As expected this had to be amended several times during the project. At monthly reviews it brought to light the points at which extra pressure was necessary to achieve the target. The major item in the Critical Path was the assembly of the 60 electrolytic cells each of which consisted of more than 75 different components. Most of these were to be purchased or manufactured locally and did not cause much anxiety. However, as soon as the switchgear manufacturer defaulted the network clearly showed that the Critical Path now shifted to this item. Concerted efforts were, therefore, directed towards the procurement of the switchgear.

12. The Corporation took this opportunity to simplify the design of the electrical distribution system without sacrificing any of its salient features in consultation with the C.E.B. and the National Engineering Research and Development Centre. Quotations were called for the new design on a worldwide basis. The switchgear was thus obtained at a much more favourable price and delivery period from outside the U.K. A situation where the completion date of the project would have been seriously affected was thus avoided.

13. A re-estimate of the project was carried out at this stage and it was found that the cost had risen up to Rs. 15.168 million. The viability did not differ much as together with the general increase in prices, the prices of our products also had gone up.

14. Once the useful work of the various Planning Committees was over a single Expansion Committee was formed of the members of the earlier Committees. The U.N. expert as well as technically qualified members of the Board took part in the monthly meetings of this Committee. The position was reviewed and an action plan for the next month was formulated. It was always found that constructive criticisms come from those in lower levels. The credit for the successful completion of the project, therefore lies on the shoulders of the technicians, foremen and superintendents.

15. As stated earlier the main difference in the old and the new plants was in the method of control. Modern control systems include electronic as well as pneumatic control systems. The training of staff for the installation and maintenance of these thus became a pre-requisite for the completion of the project. A training scheme for staff in these fields was therefore, started. Supervisory as well as Technician grade employees were sent to institutions such as the Refinery and the B.C.C. Mills. Process control by pneumatics was studied at the Refinery while automatic firing of boilers and their operation was studied at the B.C.C. In addition to this a training scheme for fitters, etc., was also started to develop the skills already available. This would enable them to handle the more modern machinery that would be installed with confidence. The assistance of the C.G.R. and the Kankesan Cement Works was sought for this. Various grades of officers were also sent for training in fields such as Administration, Management, Quality Control, Purchasing, Shipping and Clearing, etc., to develop the necessary know-how to run the expanded organisation.

16. The design and construction of the civil works connected with the project was handed over to the State Engineering Corporation in late 1972 and the work was just completed facilitating the completion of the erection of the plant in September 1976.

17. When the question of erection of machinery was brought up at the Expansion Committee the factory staff showed keen enthusiasm in doing the erection by themselves. However, on closer examination it was found out that the staff as well as the equipment available was inadequate. Attempts were then made to recruit even re-

tired skilled workers with the gracious permission of the Minister. This did not bring in satisfactory results. Once again the difficulty of obtaining the required staff at any level at Paranthan was proved. Although reluctantly it was then decided that the erection be given out on contract.

18. Together with this decision another one had to be made. That was regarding the drawing up of specifications, awarding of contracts, supervision of work, etc. Draughtsmen and Engineers were necessary for this. Two draughtsmen, a Mechanical Engineer, an Elcetrical Engineer and a Civil Engineer were then recruited. Expertise in chemical engineering was already available at the Factory. At the later stages the Engineers were assisted by Engineering Trainees, two in each discipline, in the supervision of the work of the contractors.

19. In addition to the erection of the new plant it was necessary to modify or change some of the existing plants to integrate the two. All this was grouped into various contracts and quotations were called on a restricted basis from reputed Engineering Firms. At the height of activity seven distinct groups, namely three local engineering firms, the State Engineering Corporation, the Ceylon Electricity Board, direct contract labour and permanent staff were working side by side literally tumbling over each other in confined and overlapping areas of work. However, work progressed smoothly and in harmony. The contractors "scratched each others backs" in lending/borrowing materials, tools and even skilled workers at times, literally.

20. All this work needed close supervision and co-ordination. In addition to the co-ordination between contractors, co-ordination was required between Expansion and Production. On the one hand the Expansion Project was to be completed on target. Each day's delay would mean the loss of several thousands of rupees of profit from the sale of the products. On the other hand production could not be interfered with. Chlorine had to be supplied for the treatment of water and for the bleaching of textiles and paper. The supply of caustic soda to the Paper, Textile and Soap industries could not be curtailed. The pumping of Kelani water into the water mains in August 1976 made the demand for chlorine race upwards. The Non-aligned Conference held at the time of the final assembly of the plant at Paranthan made matters worse. It would have been an international scandal if Paranthan failed in its supply of chlorine to purify water. It was a Hobson's Choice: Produce and Expand.

21. The team of Chemical, Mechanical, Electrical and Civil Engineers, ably assisted by Foremen, Chargé Hands, Fitters and others worked hand in hand to a tight schedule to dissolve this dilemma. Regular meetings where details were worked out were an absolute necessity. Before each shut down for interconnection of the new and old Plants meetings were held to which attendance of all concerned was obligatory. Detailed plans were formulated and schedules of work drawn up and handed out. Full co-operation of the entire staff was necessary in executing these military like operations. The dovetailing of Production and Expansion with only 32½ hours of stoppage of the running plant was a reality only because of this tight control.

22. The debate whether Foreign Commissioning Engineers were necessary or not had to be settled. Once again the Board of Directors gave the necessary backing to the technical staff to take on this job without outside assistance. The Commissioning Engineer for the evaporator plant alone demanded the payment of US $ 300/- per day in addition to other expenses such as travelling, board and lodging, etc. Once the decision was made quick action was necessary. The Technical Staff Officer concerned went through the literature and catalogues regarding the particular plant and prepared notes on it and sketches of it for the benefit of the others. Sometimes at formal meetings or at other times on the shop floor itself discussions were held with supervisory staff and technicians. Each employee was thus aware beforehand what was expected of him and of the plant. Commissioning became an interesting game, "Exploring the Unknown". Background knowledge to overcome any difficulty had already been imparted. Many were the difficulties. Much more were the possible solutions. Yes: solutions given by technicians, supervisors or staff officers and discussed at commissioning meetings. Only the best of these were accepted and implemented. What was assigned was achieved.

23. Do we still need Foreign Consultancy firms?

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