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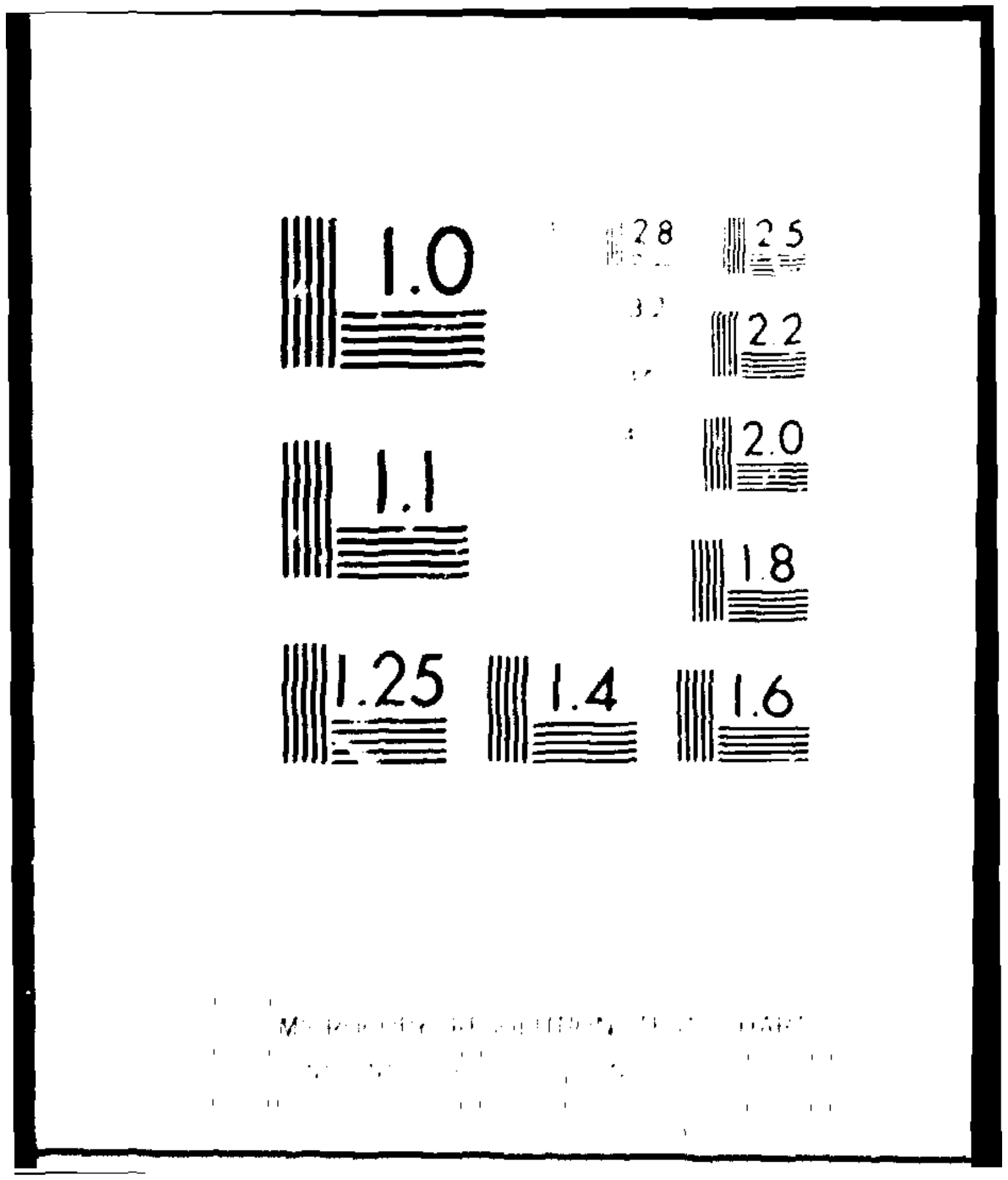
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United Nations Industrial Development Organization

Distr.
LIMITED
ID/WG.339/13
3 September 1981

ENGLISH

Workshop on Selection of Technology for Assembly of Electronic and Electrical Products in Developing Countries

Utrecht, The Netherlands, 4 - 8 May 1981

UNIDO'S EXPERIENCE IN THE TRANSFER OF TECHNOLOGY*

prepared by

the secretariat of UNIDO

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V.81-29349

The following text is based on presentation made by UNIDO's Head of the Development and Transfer of Technology Branch at the Workshop's opening session:

Technology Transfer.

This is a subject which has become very popular, particularly in the field of international co-operation since the last 5 or 6 years. People started recognising the importance of technology and technology transfer, the important role which it can play. In fact, it is something which has been going on since Adam and Eve but its significant role has now been recognised once again. It has been given a new set of clothes; it is something which we are facing in our daily life. There is not a single day that we do not see an article in the newspaper or journals referring to technology or technology transfer. Within the United Nations this has also been the case during the last years. There was the second General Conference of UNIDO known as the "Lima Conference" and the so-called "Lima Declaration and Plan of Action" adopted at that time and the third one held in New Delhi in early 1980. There were the General Assembly regular sessions and the 6th and 7th Special Sessions where the New International Economic Order (NIEO) was adopted. There was also the UNCTAD Conference in Nairobi and Manila as well as various other international conferences and meetings, all referring to technology and technology transfer. These all provided, perhaps in a somewhat piecemeal approach, various recommendations on what has to be done. All these then finally merged together into what we know as the UN Conference on Science and Technology for Development which took place in Vienna and the Vienna Programme of Action on Science and Technology for Development which was then adopted. The Vienna Programme of Action has become a guideline for all activities in the field of science and technology for development.

On the part of UNIDO since the Lima Conference and the Lima Declaration there was also some new move. Until then it was understood that all that UNIDO was doing was concerned with the problems of

technology and technology transfer. After the Lima Conference, however, it was expressively recommended that more concentrated efforts had to be put into this field and accordingly there was a re-structuring of the organisation resulting in the establishment of a new unit called the Development and Transfer of Technology Branch. Apart from this Branch which looks in general into the macro aspects of the subject there is in UNIDO a Division for Industrial Operations which carries out technical assistance activities in the developing countries. This Workshop for instance is a joint elaboration on the part of UNIDO, a co-operation between the Development and Transfer of Technology Branch and the Engineering Industry's Branch of the Division of Industrial Operations. The two have joined forces in organising the Workshop. Now when we in UNIDO speak about technology transfer, since UNIDO is concerned with economic and industrial development of the developing countries, the whole subject of development and transfer of technology is focussed on a problem which many developing countries are facing: that is that the developing countries are so much dependent on the industrialised countries and their technologies that they have to depend largely upon the capabilities and capacities of developed countries to plan and establish a new factory. It was recognised that developing countries would have to develop and strengthen their own technological capabilities so that they may take their own decisions in choosing the technology and starting up a new production activity with, according to the need, the help and assistance of industries from the advanced countries. The Philips Company have recognised this problem at a very early stage and have created the Philips' Pilot Plant which looks into this problem in a very practical manner. What were the problems that were facing the developing countries at that time was that the technologies that were available were developed for production in the developed countries. They had a purpose which was different from those that would have been for a developing country. The technologies therefore had to be adapted to suit the terms and conditions and the environment of the particular developing country. Another point there is a need, for instance, to create a purpose reoriented information system to enable to support the need of selecting and identifying the technologies among the many available alternatives. There is a recognised need to strengthen human manpower resources and also the institutional infrastructure to support all such activities.

It was finally recognised that there was a need to establish clear-cut technology policies, strategies and plans and programmes linked to the overall economic and industrial development of the developing countries. Such technology development policies would provide a framework of action with the necessary priorities and a time perspective of the action to be taken and thus enabling the efforts and resources to be concentrated in a more efficient and effective manner. However it must be pointed out that technology and technology transfer should not be considered in the narrow sense of a technique per-se, but on a much broader basis. In other words, in addition to the traditional sense of technology as a technique, it should also involve the problems of financing and management of the technology, of the markets of the products, and the marketing of the product etc. It further goes back to the education system, the vocational training of the workers, the research and development capacity to maintain the level of the technology development, the industrial relations etc. In other words, the whole problem of technology transfer has become a matter of a total action. The success and failure stories, or case studies which are being carried out in numerous numbers indicate that when the technology transfer seems to have failed, it was often when one or more of these elements were neglected or not given the required important attention. The success stories on the other hand indicate that all of these elements were being considered in its totality. Another important matter is concerning the word "technology transfer" - that it is a means but not an end in itself. In a commercial enterprise one can say the most important factor is profit which includes the ways and means to cut down the production cost or to improve productivity. Therefore the selection of the technology depends upon how can these factors be fulfilled. At the national or government level, the story becomes much more complicated since the national objectives are not always limited to simple profit earnings or productivity improvement: for instance the problems of employment, the development and utilisation of natural resources, import substitution and export oriented development of industries to increase foreign exchange earnings etc. are but a few of the national objectives. In this case the criteria for the selection of the technology becomes much more complicated - what is referred to as a "dualism" of the selection of technology.

Another matter which requires due attention is the fact that there

exists many action plans, programmes of action etc. Unfortunately, however, very few of these have really been put into action. The question is how to put the plans and programmes into practical activities, the translation of the plans into action. The present exercise which we have before us is to try to seek a solution in one part of this exercise, that is how to choose a technology in starting up an industrial production activity in the field of electronics and electrics. It is for this reason that we have tried to secure the participation of top leading people representing the various sections of the activities at industrial level and government level, at the research and development level etc. And I sincerely hope that our objectives can be fulfilled through an intensive working during the next few days. The present Workshop is designated as a UNIDO project but in fact it is a joint venture, an action carried out co-operatively between UNIDO, UNDP, ICD, the Philips Gloelampen plus each one of the participants here. It is a joint attempt to develop a guideline for technology choice and we have taken the assembly of electronics and electrical products and particularly black and white TV as a test case. The methodology is unique in that it is adopting a brand new concept of work whereby the experiences and the knowledge of the leading personalities representing the various disciplines are to be pulled together to form a basis and draw up the elements of compiling the guideline. Care was also given to have the representations to be so as to provide inputs from the smaller domestic market oriented countries, the larger domestic oriented countries and the export market oriented countries. This means that the Workshop requires the active participation of each one of the participants here at the Workshop because each one of the participants is representing a certain function which forms the basis of the methodology adopted. It is also a learning and teaching process pulled together into one. It is not a one-way street of training or a seminar exercise: it is also not a national representation that the participants here are. I mentioned about the sizes and market orientation of the countries but that is where the "country" ends. The participants here are on their own personal capacities and not as government or country representatives.

Now I would like to dwell upon another subject. There is much heard about recently concerning advanced technologies, or technology

break-throughs. Quite a number of publications appear on the market, like for instance "The Third Wave" of Alvin Toffler or "The Challenge of the World" by Servan Schreiber etc. It refers to the new movements of an entirely new set of technology emerging that might change completely the present production methods - genetic engineering, biotechnology, electronics and microprocessors, new energy technologies, lighter than air technologies etc. are some of these examples. I have just returned from a seminar organised in Japan. Some 10 years ago a movement started where the small and medium industries could not compete in international and domestic markets due to the high wages of the workers and therefore the trend to move out to the developing countries where lower wages were available. Now this trend seems to have started to reverse its direction and x small and medium industries are now returning back to Japan. Some of the reasons may be that what was considered as low wage was not necessarily low when considering the productivity of the workers, or for instance the instability of the political situation in the countries. However, a major reason is that the trend for utilising the robots for the robotisation of the industrial process has gone down to the level of application in small and medium industries. In other words now so many small industries are utilising robots in their production process. The advantage of such robots are easy to recognise, the robots do not go into strikes, they can continue working 24 hours a day, there are no fringe benefits and other cost elements involved and there is an assurance of the quality which forms a very important element of industrial production these days. Frankly speaking I was shocked by what I had heard in Japan and I felt that there was an urgent need that the matter be more carefully looked at, particularly the application of these advanced new technologies to the development of the developing countries. The robots would be replacing the employment opportunities and if this trend would continue the problems of employment in the developing countries would have to be looked into from a different perspective. Of course what I have just mentioned now is not a direct objective of the present Workshop but I feel it is as important as the main subject about which we are to discuss and this fact should be kept in mind. Similar to what has happened after the second World War, the Federal Republic of Germany and Japan, which from the industrial production viewpoint have overtaken the United States of

America, the United Kingdom etc. This was because of the possibilities open to Germany and Japan to adopt new technologies and apply them to the industrial production. From that viewpoint I have heard some people expressing their opinions that the developing countries might indeed have a good chance to accomplish the Lima target of 25% of the total industrial production by the year 2000. This would still require very hard work on the part of the developing countries and the work in the international co-operation field. However, the present Workshop might be considered as one step towards achieving this objective.

The Workshop as I have mentioned is a typical case of co-operation on that international basis. It is pulling together all the experiences that are available at the various organisations as well as countries and industrial sectors. If the approach is successful then we are hoping to apply a similar approach in other fields. I sincerely hope that for the benefit of all of us, we may be able to carry out successful deliberations and later on look back at the week of May 4 - 8, 1981 as a significant activity in the course of international co-operation and industrial development. Thank you.