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Interregional Training Workshop
on Industrial Project Implementation

Amsterdam, 17 September - 3 October 1969

AIDE MEMOIRE:

PURPOSE AND SCOPE

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I. Purposes of the Interregional Training Workshop

As is well known, effective implementation of industrial projects is of crucial significance to developing countries. Only recently several developing countries and many field experts have pointed out that the implementation of industrial projects is the least regarded of the major problems confronting developing countries in the course of industrialization. All too often, failure to achieve targeted development has been failure to achieve successful or even satisfactory implementation to the extent that this has frequently been a considerable impediment to industrial development. Experience indicates that developing countries encounter a number of problems in the course of project implementation. Foremost are lack of appropriate techniques for programming, coordination and control of project implementation and lack of qualified personnel in charge of implementation.

In order to alleviate these problems the United Nations Industrial Development Organization (UNIDO) will organize an Interregional Training Workshop on Industrial Project Implementation.

II. Location and date of the Interregional Training Workshop

The Interregional Training Workshop will be held in Amsterdam, the Netherlands, from 17 September - 3 October 1969. The participants of this Workshop might have the opportunity to attend the Second International Congress on Project Planning by Network Analysis which will also be held in Amsterdam from 6-10 October 1969, i.e. it will directly follow the Training Workshop.

III. The [illegible] Workshop

The [illegible] workshop will comprise about 25 participants from 20 developing countries. The participants to be selected are those responsible for working in one or more of the stages of project implementation. These stages include detailed project design and planning, bidding and contracting, developing the project implementation plan or schedule, constructing the plant and starting-up production.

IV. Scope of the International Workshop

The international training workshop is designed to include mainly the following:

1. Techniques for programming and control of project implementation*

It has been recognized that the complexity of the industrial development projects has challenged current implementation programming and control techniques in most developing countries. Implementation problems and shortcomings have been recognized only when they have occurred and by the delays and overrun of cost. The situation has been further aggravated by the absence of adequate coordination between the parties (governmental departments, local

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* Programming of project implementation is used here to indicate not only the process of subdividing the project into its component tasks or activities and identifying their interrelationships, but also for each of these activities, the selection of methods for execution, the assignment of resources, the estimation of time requirements and the establishment of the necessary scheduling data. This process results in a plan of operation and a time schedule for implementing the project which, for brevity, may be called the "project implementation plan". The project implementation plan must, of course, be communicated to the parties in charge of its execution. The "control of project implementation" must also include an evaluation of progress, a review of deviations, reallocation of available resources, and the updating of the project implementation plan in order to achieve more effective implementation. In the rest of this note "programming" implies "programming and control".

and foreign contractors) participating in the implementation process. As an example, ordered machinery and equipment are frequently received before construction work and buildings necessary to house them are completed, and thus they might be damaged or become rusty with a loss of capital invested, particularly the foreign exchange component in case of imported items.

Furthermore, existing techniques in most developing countries fail to recognize project implementation as a dynamic process. Since conditions inevitably change in the course of implementation, a project implementation schedule or plan that was initially well prepared frequently ceases to be so soon after its execution has started. For example, deliveries of supplies may fail to meet scheduled dates, climatic factors may effect delay and interruption of work. In the absence of "dynamic implementation programming and control techniques" which allow continuous programming in greater detail as the project progresses and continuous reprogramming of the originally prepared project implementation schedule or plan, successive work is then performed as if it were not programmed before or according to a schedule which has ceased to be valid and hence there is interruption of work, waste of scarce resources and increase in cost.

Therefore, one of the main objectives of the interregional training workshop is to train the participants from the developing countries in the step-by-step application of dynamic operational techniques for programming and control of the implementation of individual industrial projects and groups of projects such as the network analysis techniques* which are adapted to the conditions prevailing in developing countries (as for instance the lack of

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* Network analysis techniques became the world-wide accepted tool for planning or programming and control of project work. They have originally been applied to projects in developed countries but soon their value and the benefits achieved from applying them have been and are being appreciated by most developing countries even for small and medium-sized projects.

skills and the scarcity of particular facilities in a given situation) which are to be illustrated by examples and case studies from developing as well as developed countries. The approach to these techniques to be followed in this training workshop is essentially practical, comprising a set of fundamental principles which are applicable to any project situation. The role of computers in applying these techniques will be briefly covered but the emphasis will be placed on manual techniques which can be easily understood and readily used in developing countries.

Specifics of these techniques

The techniques to be included in the training workshop are used in identifying component tasks or activities of the project(s) at hand, determining their interrelationships, making time-cost trade-off decisions for project activities and allocating resources. A brief discussion of these is of value.

The identification of project activities makes it possible to estimate more accurately the time required to accomplish each of them. By determining the interrelationships of the activities, one can make simple computations of the basic scheduling data of the project activities, thus determining the activities that control the duration of project implementation. (If the accomplishment of any of these activities is delayed, the project completion date will be delayed by a corresponding amount). In this way, project management can concentrate its efforts where they are most needed and utilize its resources with a minimum of waste.

In project activities the problem of time-cost trade-off arises from the fact that most of the activities of the project can be performed by a number of alternative methods requiring different periods of time, resources and costs. In undertaking an activity, direct and indirect costs are subject to change when the performance time changes. In expediting a project activity, i.e. if its rate of implementation is quickened - direct or variable costs tend to increase. If the project completion date

has been set by certain economic linkages, time-cost trade-off techniques would be applied in order to arrive at the implementation schedule of project activities which meet the specified completion date with the lowest total direct costs. These techniques, however, can also be used for finding a more general solution for the lowest overall project cost, as when they are applied to determine the most economic completion date of a project. Here indirect or fixed costs should be considered as well since they tend to decrease as project duration is shortened and time-cost trade-off techniques should be carried out with a view to developing a project implementation schedule which gives the lowest sum of direct and indirect costs.

The allocation of resources often presents a problem. Most of the activities of a project require one or more resources for their performance. If a project implementation schedule is developed, the amount of each resource required for each time period can be determined. If the demand for one or more resources exceeds their availability during certain periods, some project activities will have to be rescheduled in order to reduce the demand for this or these resources during these particular periods. In case of excessive demand for certain scarce resources, the performance of some project activities may also have to be replanned to satisfy resource availability. In some cases these factors may necessitate delaying or extending the duration of implementation. The proposed effective techniques for implementation programming have as a main objective the development of an implementation schedule that meets resource availability economically and minimizes delays or extensions of the duration of project implementation. Such techniques provide an effective tool for the programmer who must deal with the more complex problem of allocating resources for several projects to be implemented concurrently.

It is worth mentioning that these techniques have been successfully applied in several developing countries which are at various stages of development and have different economic and social frameworks.

2. Project implementation system

As is well known, development programmes and the projects selected to implement them express the prediction of the behaviour of a set of variables over the programme horizon, during which conditions change and hence may influence beyond the control of the planners, and even beyond the control of the government, may develop such as foreign trade, foreign aid, changes in price levels etc. any of them may have a profound effect on the assumptions on which the feasibility of the development programme and/or projects were based. Thus, sufficient flexibility and appropriate organization and decision-making in the process of implementation is required to allow changes and accept adjustments in a proper situation. To facilitate prompt adjustment a feedback mechanism should be established to make it possible to undertake modifications to the initial plans on time, according to actual experience gained in the course of implementation. Proper channels of communication should be established so that necessary information and/or directives can reach the right place at the right time.

The aforementioned necessitates an integrated approach to project implementation whereby implementation is geared to some control systems - in other words, project implementation systems. These are: organization and decision-making system, information and monitoring system and communication system.

The Interregional Training Workshop, therefore, will deal with these systems - their definition, components, functions, design and efficient operation - taking into account the conditions prevailing in developing countries. It should be noted, therefore, that the underlying concepts, and the main functions of each of these systems, are valid irrespective of the size of the project in hand and availability of facilities and qualified personnel necessary to operate them in the country concerned. However, the degree of sophistication and detail in applying them varies accordingly. It seems worthwhile to include a brief exposé of

of the main areas which the International Training Workshop will deal with under each system.

(a) Organisation and decision-making system

This includes the various programme or project implementation at the country or project level. The various levels and elements of the organisational set-up necessary for implementing the development programme and/or project in hand; definition of objectives, delegation of responsibility and authority from higher to lower levels in the system to avoid delays and cost increase in decision-making, and the importance of locating the point of decision-making as far down the organisational hierarchy as possible. Here consideration should be given to a number of factors such as: the nature of decisions to be taken, whether they are strategic and concern policy measures of the agency, department or company sponsoring the project, or tactical and involve operational problems which may be of a day-by-day nature; the capability of the personnel at each organisational level; and at what level reliable information in the degree of detail required is available at the right time.

(b) Information and monitoring system

This covers the different aspects of this system which involve collecting and maintaining a flow of information on each part and phase of project implementation, processing, classifying and storing this information so that it will be readily available for use, reviewing and adjusting the originally adopted logic of the project implementation strategy, and updating the project implementation plan or schedule to render it realistic for further use as a control tool for project implementation. It is also of importance to discuss the types of information required and their value at different stages of project implementation, such as: project preparation and planning comprising information related to project feasibility and project evaluation; preparation for and programming of implementation comprising information related to project design, tender specifications, billing, financial

arrangements, structure of capital investment, scheduling project implementation according to resource availabilities and desired completion date, and contracting and/or subcontracting, including appropriate types of contracts; and project construction, start-up of production until the project reaches its normal production level involving [illegible] de-bugging of the production process.

In this respect it is impossible here to over-emphasize the importance of monitoring project implementation. Therefore, monitoring and related techniques will be dealt with in detail: interval of reporting and influencing factors; comparison of actual performance with estimates in terms of time, resources and their rate of utilization and costs, delays and their causal factors and cost, and cost overruns; alternative corrective action, decision-making to alleviate implementation shortcomings and updating project implementation plans.

It goes without saying that the efficiency of the information and monitoring system depends on the communication system in effect.

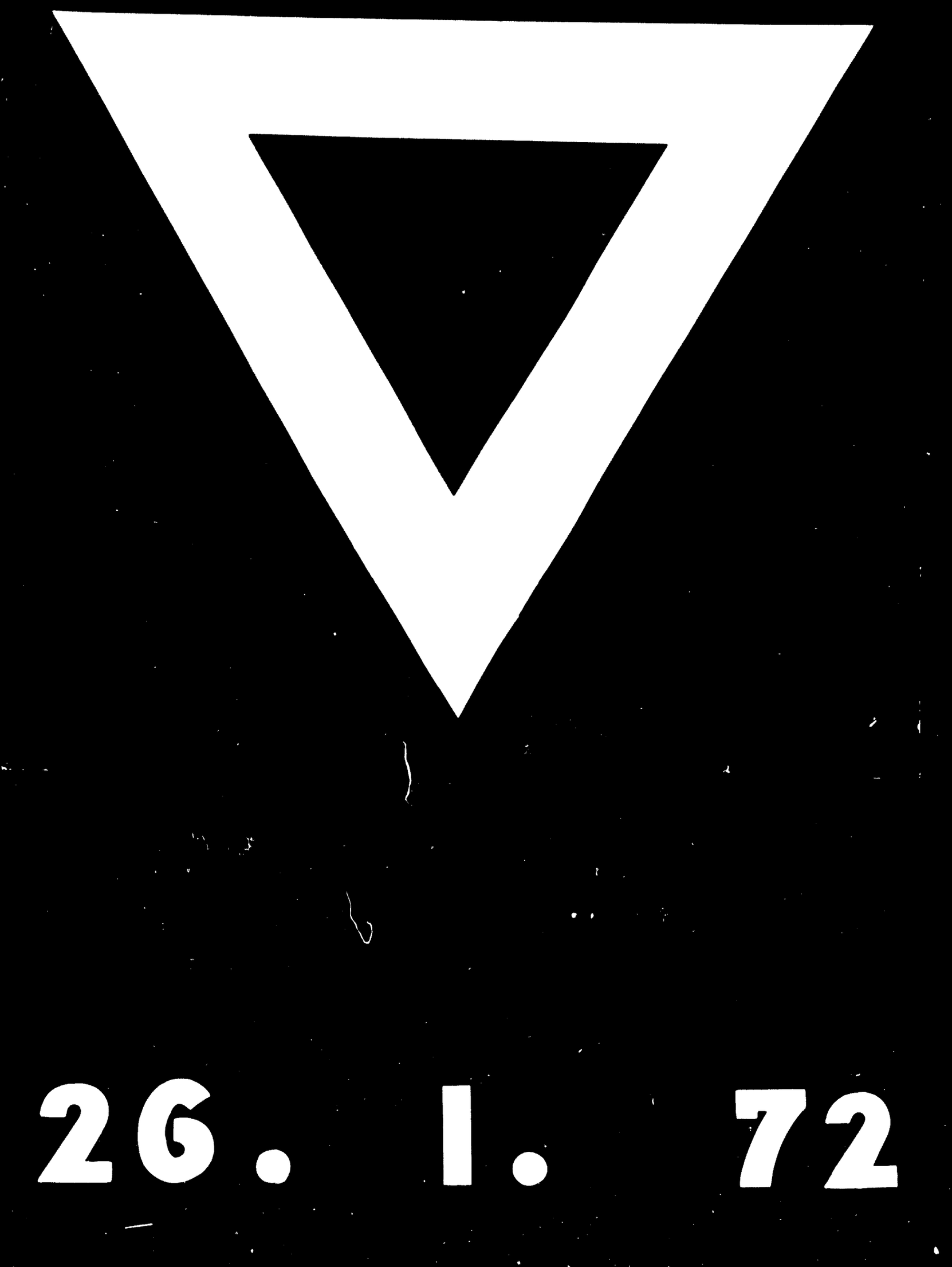
(c) Communication system

Within the organizational system the communications system is necessary to transmit precisely and on time the information collected from lower to higher levels as well as sideways among project personnel at the same organizational level. When decisions are taken by top management and translated into directives, the communications system is to convey these directives from higher to lower organizational levels.

In dealing with this system the Interregional Training Workshop will consider the different means of communication and the factors influencing their choice. Since information is mostly written in the form of progress reports when it is transmitted to the sponsors of the project, such as industrial development agencies or government departments or other bodies outside the project organization, the progress reports will be discussed in

detail, including the types and forms of reports which will give the analyst the best opportunity of identifying and resolving project implementation problems effectively and without delay, and what factors should be considered in this regard. It should be noted that since other government departments (such as ministries or departments of transport, power, labour, housing etc.) and perhaps sources of finance outside the project organization system, are concerned with different aspects of the project and need to be kept informed of its progress, it would be putting an intolerable burden on project management if it were obliged to produce different returns and separate information for each. Therefore, standard reports will be dealt with where the bulk of the information required can be collected and developed at lower levels in the organizational hierarchy.

The above mentioned systems will then be illustrated by some examples of appropriate organization forms for project implementation to various situations in developing countries.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