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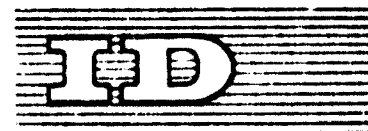
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ISSUE PAPER

SESSION IV

ITEM 7 OF THE PROVISIONAL ANNOTATED AGENDA

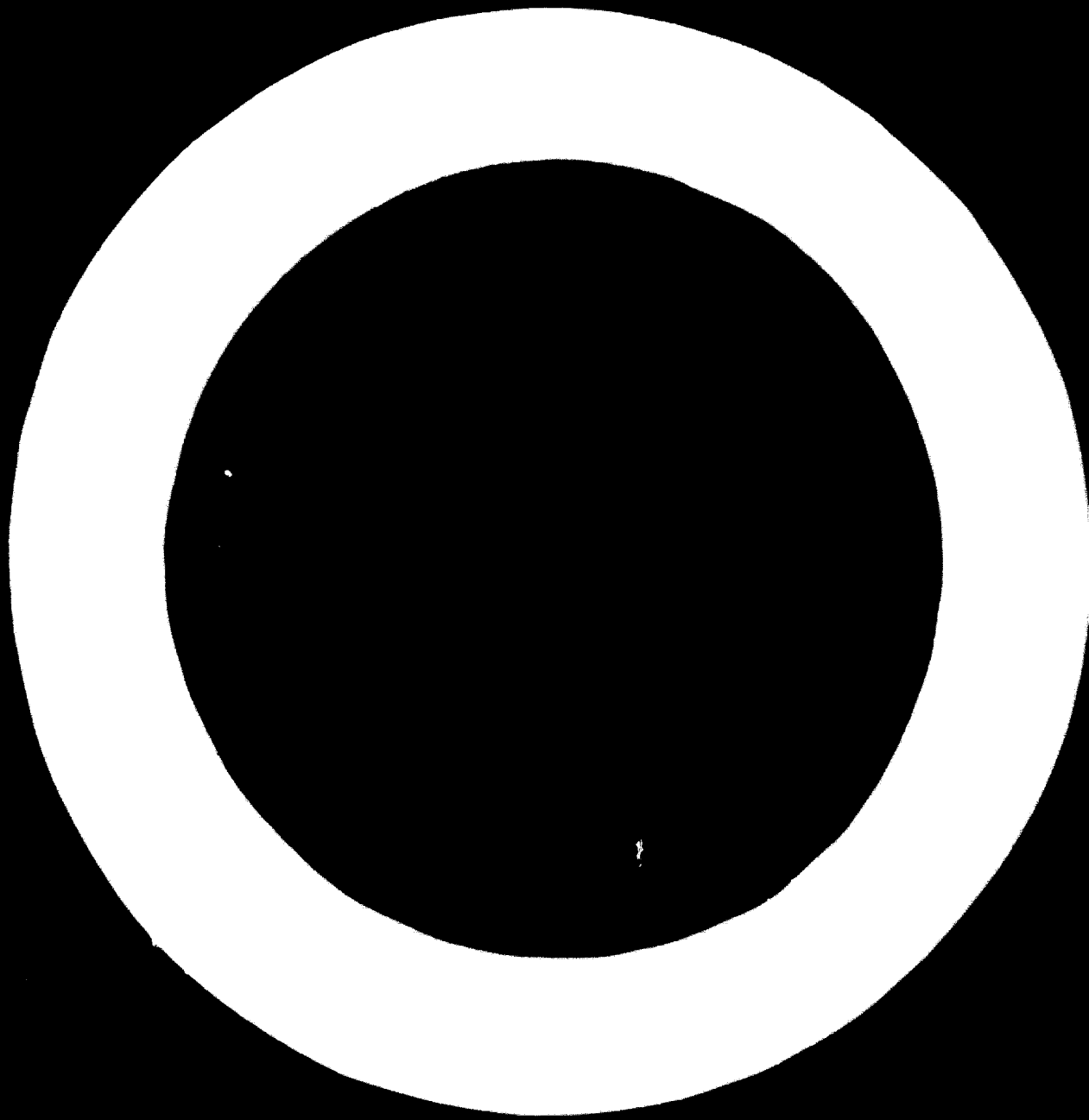
MANAGERIAL AND ORGANIZATIONAL
ASPECTS OF MAINTENANCE ^{1/}

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Introduction.

Modern management techniques are today indispensable to industry and have been recognized as such even in the developing countries. Yet in the field of repair and maintenance, such techniques are badly neglected. While, for instance, such elemental management tools as planning and control are applied to production, little attention is paid to applying such planning and control to repair and maintenance. This neglect of repair and maintenance within the industrial process has in many instances impeded the advance of industrialization in developing countries and is particularly unfortunate in view of the limited production facilities and capital such countries have at their disposal.

Surveys in developing countries show in many instances deficiencies in repair and maintenance arising from poor management and faulty management decisions rather than from lack of technical experts. Perhaps too much reliance has been placed on the technical aspect of this problem at the expense of the managerial. Maintenance personnel, even those at the managerial and supervisory levels, are often competent at the technical level, while lacking modern management skills. Efficient maintenance constitutes an integral part of the production process and requires its own approach to planning and control within an industrial enterprise. Maintenance requirements in industry today, whether in developed or developing countries, can no longer be met by a "frontal attack" using physical repair facilities and technical know-how only. Many enterprises with adequate repair facilities and skills cannot cope with their maintenance problems because of lack of adequate management. Proper organization, planning and scheduling are essential for avoiding some of the repair work that is being actually carried out and for eliminating peak loads,

which lead an enterprise to build up facilities for meeting such peaks, with the corresponding waste during periods when work levels off. In addition, such planning would save on cost, skill and equipment - scarce assets in all developing countries.

The Symposium may wish to discuss the various managerial and organizational aspects of the problem, some of which are listed below, and recommend appropriate solutions. It is realized that the background papers presented to the Symposium under this item do not cover all aspects, and it is hoped that the experience of the participants will help to bring forth additional considerations bearing on this important issue during the debate.

Maintenance Organization.

Although the basic principles of organization are the same for all plants, any organization system must additionally take into account the following factors:

- a) Type and size of plant: The scale of production has a marked effect on the organization to be adopted; bigger plants do require and can afford a more sophisticated system. Again a maintenance system suitable for an automobile production plant, for instance, may not be suitable for a petro-chemical plant.
- b) Type of equipment: For the same type of production, the most suitable maintenance system depends on whether simple machinery or highly mechanized machinery is used.
- c) Number of working shifts: A system which is suitable for a factory working one shift and having sixteen hours a day available for maintenance is different from that suitable for a factory working two or three shifts a day.

- d) Types of services involved: A plant that provides its own power and steam, and supplies other services needs a different type of a set up than a plant where most services are supplied or maintained by outside bodies.
- e) Type of skills available: Skills in developing countries are scarce and hard to build-up at the required rate. Rather than adopting a sophisticated system for which the required skill is unobtainable, the appropriate system to be adopted should be tailored to the potential skill available.
- f) Local conditions: A plant near the machinery supplier or located where central repair shops and maintenance organizations are available needs a much simpler set up than a plant isolated from such facilities. Since these locational factors vary, there can be no fixed rules or set ups which would suit all conditions.

The determining of the appropriate organization for each enterprise is essential, particularly for smaller ones. Lack of such organization is common, but also over-organization has been known in some instances when systems used in more advanced countries have been indiscriminately copied; in other cases and, perhaps as a reaction to shortcomings resulting from past unplanned maintenance, maintenance has been over-organized to a point as to become an end by itself and not as a means to attain certain objectives. Smaller companies in particular must guard against such a mistaken approach.

Maintenance Planning.

It is impossible to cope with maintenance and repair by just waiting until a breakdown happens or a machine stops, i.e. by the "fire-fighting technique". Maintenance work should be planned. An important phase of maintenance planning is what is known as "Preventive Maintenance".

Some enterprises report that their maintenance costs have been reduced by as much as 40 percent after about four years of introducing preventive maintenance programme, not including savings due to reduction of downtime of equipment.

Maintenance Records and Control.

A maintenance records and control system, including adequate costing, is essential for management. A well-organized system is usually achieved only after some years of continuous re-planning and re-organization based on facts and figures fed back to the system. No less essential is the availability of a costing system for deciding on whether to replace equipment or to continue repairs or when the problem of stand-by is under consideration.

Spare Parts Storage and Supply.

In many developing countries lack of spare parts is a major hindrance to efficient maintenance. While a stock of spare parts is necessary, undue over-stocking which imposes a great financial burden on an enterprise must also be avoided.

Spare parts supplies are a crucial problem for enterprises in developing countries and deserve special consideration. The Symposium may wish to discuss in detail this issue and its implications.

Upgrading and Training of Personnel.

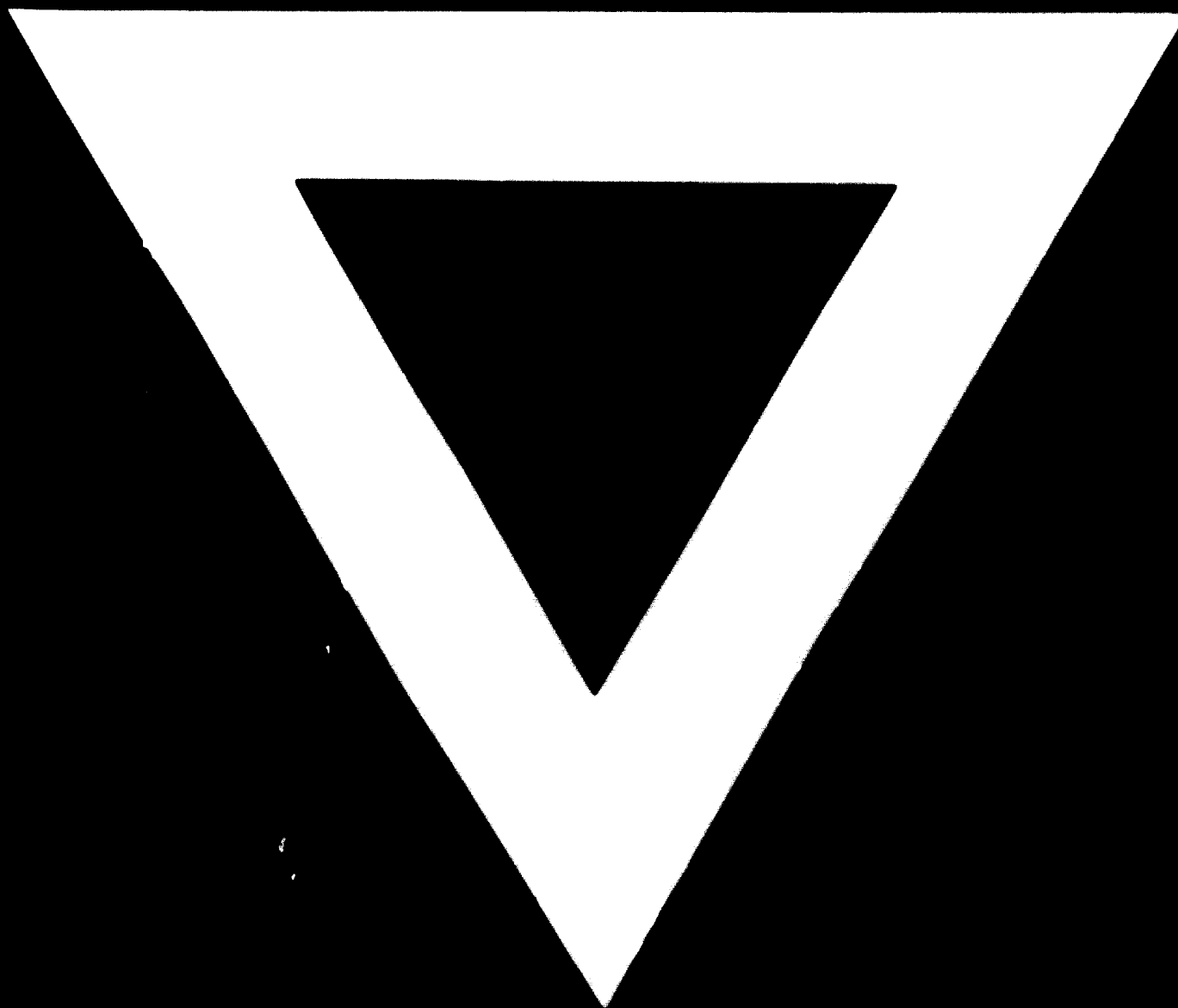
The backbone of maintenance activities is qualified personnel; all other facilities being just tools for such personnel in attaining the required objectives. The building up of an adequate personnel force through a planned training programme both at the managerial and labour levels is the responsibility of top management. At the same time, formal training should be supplemented by giving maintenance personnel the opportunity of gaining experience on the job.

Standardization of Equipment.

Standardization of equipment simplifies enormously maintenance efforts and reduces considerably the stock of spare parts. However, such standardization is not easily achieved by developing countries which are often obliged to purchase equipment from these countries giving them loans or donation for acquiring such equipment. Also the tendering system adopted by most developing countries does not promote standardization, the aim being to obtain the best terms of purchase and not standard equipment. It should be kept in mind that standardization may also result in some suppliers monopolizing the market for years with all dangers this implies.

Contract Maintenance.

Sub-contracting maintenance and repair work to specialized firms may prove advantageous in many cases. Such sub-contracting can be particularly useful for seasonal peak jobs or for operations which need special machinery which it would be uneconomical for individual enterprises to purchase or to maintain. The planning and organization of sub-contracting arrangements requires in particular management attention.



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