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Agenda item VI/1

THE PREPARATION OF THE TECHNICAL STAFF AND
PERSONNEL FOR THE FERTILIZER INDUSTRY

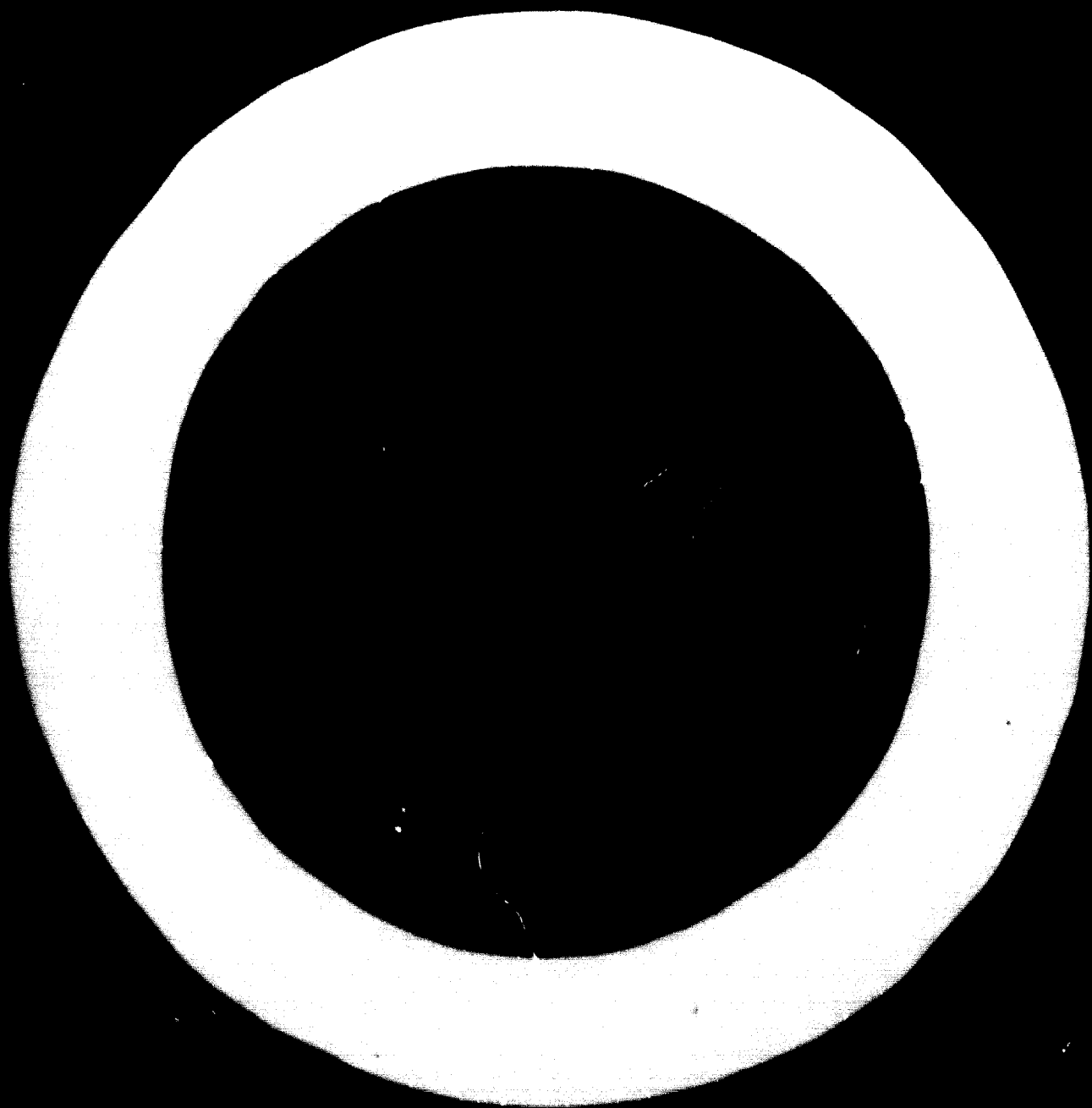
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The great and increasing world demand for fertilisers to meet the ever growing needs for "FOOD" for a fast growing world population has given a special importance to the development of the fertiliser industry. Consequently the fertiliser industry has taken the lead in the order of importance and priorities in practically all plans for the development of the Chemical Industries. This trend is especially evident in the "Developing Countries" particularly in such countries, with one or more of the basic natural resources for the development of this industry. Furthermore, modern technological developments e.g. the development of Giant Ammonia Units and economic Ocean Transport of Ammonia etc.. has given greater impetus to the possibilities of the development of the Fertiliser Industry in developing countries.

In the rush for the construction of fertiliser plants, developing countries in the greater majority of cases are primarily concerned with obtaining the financial facilities, the equipment, the raw materials etc.. but, again in the greater majority very often do not pay due importance and attention to the "availability of qualified staff and personnel" for the Planning.

Engineering, purchase construction and erection of these factories, and, finally, and most important of all, for the efficient operation and maintenance of these factories.

The availability of qualified staff for the Proper and Efficient Planning, Engineering, Purchase, Construction and Erection would ensure the realisation of the project at the right time and location with the best process and equipment to do the job with minimum capital investment given the necessary inputs.

The availability of efficient staff for the efficient operation and maintenance of the plant would ensure continuous operation, best and highest production in quality and quantity within the Industrial norms accepted internationally. To reduce the outages and to increase the number of days of continuous operation at full guaranteed design capacity say from 300 days per annum to 330 or 345 days etc... Gives high economic returns. This result however could not be achieved without the availability of efficient qualified staff for operation and maintenance.

Close scrutiny and analysis of operational data of fertiliser factories in developing countries will show a much lower efficiency of operation than in developed countries which is primarily due to the lack of the necessary qualified staff required for

operation and maintenance.

The UAR fully realized the importance of the problem right from the beginning of the great Industrial Development Plans launched after the 23 July, 1952.

Therefore the Ministry of Industry took the lead in the creation of special Industrial Training Centers for the preparation and training of qualified personnel for the various industries. At the same time, however, the various industries were directed to and charged with the responsibility of preparing the necessary required specialised " Technological Cadres " to cover their requirements for the efficient operation and maintenance of the factories.

As an example of this work and efforts in the field of the Chemical Industries in UAR by one of the newly created Industrial Centers we may cite and consider briefly the work carried out by Egyptian Chemical Industries " KIMA " which succeeded in the last stage to create its own Institute of Technology, " KIMA " Institute of Technology (KIT) ", centered at its factories in ASWAN for the preparation of the Technological Cadres of all levels in the four fields of specialisation (electrical, mechanical, chemical, metallurgical) in the general field of Electrochemical and Electrothermal Industries.

Intermediate Course :

Candidates are recruited by selection from students who completed their Secondary School Education whether General or Technical according to special criteria of merit in Mathematics, Physics, chemistry and foreign languages (either English or French) .etc...

Successful candidates are then admitted to a special dual " Intermediate Course " which comprises:

- a) a theoretical course of study over 25 weeks comprising 24 hours per week, i.e. 600 hours in total.
- b) a practical training course in one of the departments of the factories extending over 26 weeks at the rate of 42 hours per week and thus totalling 1092 hours.

At the end of this course candidates must pass an examination and successful candidates are qualified and formally appointed as " Technicians " either in the operation or in the maintenance departments according to the candidates secondary school education and courses of training in the factories. Normally, candidates with General Secondary School Education are generally directed to work in " Production Operations " whilst candidates with Technical Secondary School Education are directed to work in Engineering

and Maintenance Departments.

" The Technicians " with education and training as outlined above therefore stand at the FIRST step on the scale of the Technological Cadres.

Upgrading by Higher Education and Training :

Technicians working at " KIMA " have the privilege to apply for admission to higher courses of education and training:

Higher Course Part I.

Comprising a course of theoretical studies over a total of 6 terms each term of 20 weeks, i.e. a total of 120 weeks, with 27 hours theoretical studies in class per week.

Therefore the total hours of theoretical studies in this course are $120 \times 27 = \underline{3240}$ hours.

At the same time the candidates are given advanced practical experience and training in the plant over a period of 130 weeks at the rate of 42 hours per week totalling 5460 hours.

Candidates who complete this course and successfully pass its special examination are therefore qualified as " Skilled Technicians " and are eligible for appointment as " Technical supervisors " who take full charge of a shift either in production operations or in Engineering and maintenance operations according

to the educational and technological background of the candidates.

Higher Course Part II.

" Skilled Technicians " and " Technical supervisors " working at KIMA have the opportunity to complete their high education and in-service training by proceeding with the High Course Part II.

This course comprises higher theoretical studies over a period of FOUR terms each term of 20 weeks i.e. a total of 80 weeks with 30 hours theoretical studies in class per week, making a total of $30 \times 80 = \underline{2400 \text{ hours}}$.

Candidates who complete this course and pass the examinations are then given a " Project Task " which they are required to work out. " Project Tasks " are usually selected in connection with related Technological activities of KIMA.

On the completion of the Four Steps of higher education and training in-service namely :

1. The Intermediate Courses.
2. The Higher Course Part I.
3. The Higher Course Part II.
4. The Project Task.

The Candidates graduate and receive the Bachelor's degree of the KIMA Institute of Technology since the Institute has been formally recognised by the Ministry

of Higher Education and its Courses are approved as equivalent to those given at the Universities qualifying for the Bachelor's degree in Engineering Science.

In this way KIMA was able to create a special and new educational system which has the following features and advantages :

- a) It opens a new way for the youth to proceed after their secondary school education with their higher education whilst at the same time working in active production earning a good living and building a career at an early age.
- b) It ensures proper evaluation of skills and capacities and fair and equal chance to workers in industry for promotion on sound basis.
- c) It ensures the best and most efficient Technological training and education for Industry through the development and growth of the Technological Cadres within the disciplines of the Industry.
- d) It saves time since the graduates at every stage are fully qualified to take responsibility in the field immediately.

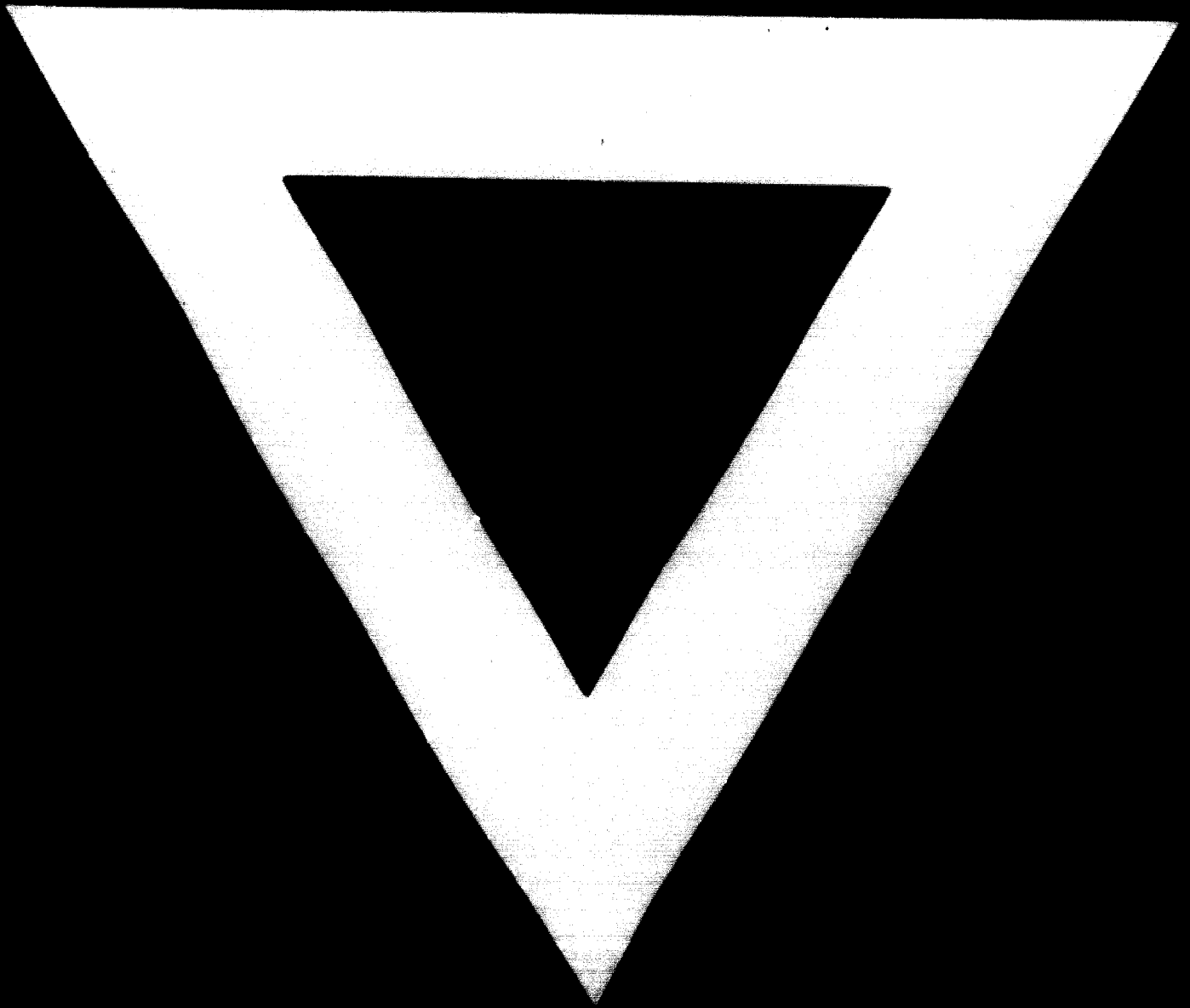
- c) It gives high economic returns through higher efficiency in operation and maintenance of the Plant.

The activities of "KIMA Institute of Technology" "KIT" together with "KIMA Computer Center" "KCC" are also planned from the start to handle research studies and development work as well as project planning, production control etc ...

However we restricted ourselves in this paper to the outline of one of the major tasks carried out by the 'KIT' in the preparation and upgrading to Graduate (BSc. Tech.) level of well qualified and efficient staff of 'Blue Collar' Engineers and Technologists for the fertiliser Industry and the general field of Electrochemical and Electrothermal Industries.

It is evident that the task is not easy and at the same time a costly one, however, it is well worth it as the returns are truly substantial.





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