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INDUSTRIAL RESEARCH AND  
DEVELOPMENT CENTRE,  
DP/SYR/72/006,  
SYRIAN ARAB REPUBLIC.

Terminal report

Prepared for the Government of the Syrian Arab Republic  
by the United Nations Industrial Development Organization,  
executing agency for the United Nations Development Programme

Based on the work of M. A. Shaaban, Project Manager

United Nations Industrial Development Organization  
Vienna

id.77-7173

Explanatory notes

References to dollars (\$) are to United States dollars, unless otherwise stated.

The monetary unit in the Syrian Arab Republic is the Syrian pound (LS).

Use of a hyphen between dates (e.g. 1970-1976) indicates the full period involved, including the beginning and end years.

Besides the common abbreviations, symbols and terms, the following have been used in this report:

|         |   |
|---------|---|
| IRDC    | Industrial Research and Development Centre (Syrian Arab Republic) |
| m/m     | man-months  |
| PVC     | polyvinyl chloride  |
| R and D | research and development  |

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ABSTRACT

This is the terminal report of the United Nations Development Programme (UNDP) project "Industrial Research and Development Centre" (DP/SYR/72/006) in the Syrian Arab Republic, for which the United Nations Industrial Development Organization (UNIDO) was the executing agency.

In view of the general conditions prevailing in the Syrian Arab Republic, particularly as regards the availability of professional personnel, the degree of implementation of the project was satisfactory.

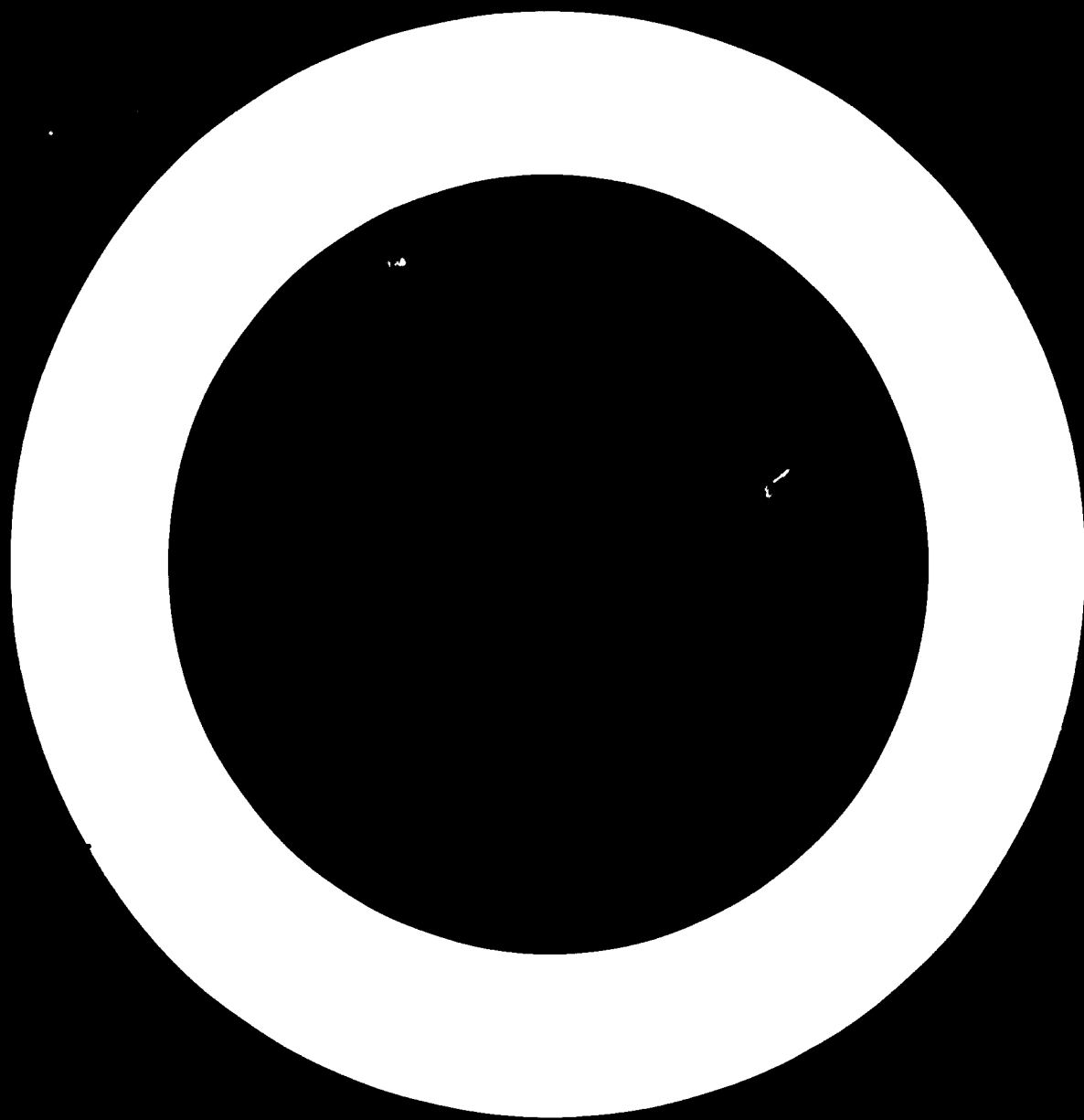
Government inputs exceeded the amount mentioned in the project document, and UNDP/UNIDO inputs were also satisfactory.

The main difficulties encountered were in the recruitment of highly qualified personnel. The lack of incentives offered by the Centre was the main cause for the <sup>low</sup> recruitment rate, which, in turn, retarded the implementation of some fellowships. Furthermore, such counterpart personnel as could be found generally lacked previous experience, and needed training. Some delays in the recruitment of experts and procurement of equipment should also be mentioned. These and other factors made it impossible to implement such a many faceted project to a very high degree in 3½ years.

In general, the UNDP/UNIDO team of experts did a very good job and their co-operation with the local staff gave the best possible results.

The most important recommendation made in this report is that a second phase of the project should be started as soon as possible, so as to consolidate the efforts made during the first phase. Moreover, a second phase could improve on the first by giving more support to activities which had little or no support during the first phase, by means of experts, fellowships, and equipment.

In the formulation of the second phase some of the provision for experts and fellowships should be left unspecified: it was found in the first phase that various changes in these components were approved in tripartite meetings, and in a multi-purpose project like this, some flexibility is required.



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## INTRODUCTION

### A. Background

This is the terminal report of the United Nations Development Programme (UNDP) project for the establishment of an Industrial Research and Development Centre (IRDC) in the Syrian Arab Republic (DP/SYR/72/006). The project was an amalgamation of two previous UNDP projects: the first was the "Industrial Testing and Research Centre" (DP/SYR/64/517), for which the United Nations Educational, Scientific and Cultural Organization (UNESCO) acted as executing agency; the second was entitled "Strengthening the Bureau of Industrial Project Evaluation and Feasibility Studies" (DP/SYR/70/534), for which the United Nations Industrial Development Organization (UNIDO) was the executing agency.

The idea of the first project dates back to 1960, when the Syrian Arab Republic started to prepare its first Five-Year Development Plan. The project was agreed upon between the Government and UNDP/UNESCO in 1964, and the Project Manager arrived in the Syrian Arab Republic in the middle of 1965. Project activities included setting standards, executing fellowships and ordering equipment. No laboratories were available, and real scientific or technical activities were not undertaken.

The second project was agreed upon between the Government and UNDP/UNIDO in 1970, although the project started its activities in September 1971. Initially, the project was under the aegis of the Ministry of Petroleum and Mineral Resources, which tended to narrow its range of activities. Eventually, the Ministry of Industry took over the direction of the project.

In 1972, the Syrian Government and UNDP agreed to eliminate overlap and to maximize the efficiency of the projects by merging them into IRDC ("the Centre"), with UNIDO as the executing agency. A project document was prepared. Official approval of the project document was not given until 15 November 1973.

According to the original project document, the project should have started in mid-1973 and lasted for four years. However, owing to the delay in approving the project document, the project did not start until January 1974. The project duration was effectively reduced to three and a half years, formally ending in August 1977.

## B. Objectives

The long-range objectives of the project were to assist the Syrian Government in setting up and initiating the activities of the Centre. The Centre was to contribute to the industrial development of the country by carrying out industrial testing and analysis, applied research and development in problems related to feasibility studies, engineering, production, quality standardization and applied metrology as well as by providing a wide range of technical information services. The Centre was also expected to advise and assist the Government on technical matters in the preparation of industrial development programmes.

The following were the main immediate objectives:

1. To help in performing technical advisory services for local industries in the fields of technology, economics, finance and organization, with a view to improving production processes, raising the quality of products (including the installation and operation of quality control systems), reducing production costs, and developing data on which investment decisions could be based.
2. To aid in adapting technological know-how of foreign origin to local conditions through applied research and development studies; to carry out research activities aimed at improving industrial forecasts and developing new products and processes that utilize as much of local raw materials and industrial by-products as possible.
3. To assist in conducting techno-economic feasibility studies based on sectorial analyses and in the pre-assessment of specific industrial projects within the sector.
4. To assist in preparing and applying industrial standards and codes of practice, including analysis and testing, as well as in national product certification.
5. To assist in establishing applied metrology services and workshop facilities.
6. To assist in establishing and developing a technical information service for local industries.



7. To promote the training of local research personnel in appropriate scientific and industrial fields so as to ensure the continuity of activities after the project is completed.

C. Finance

The total UNDP budget of the project was increased from \$776,000 in the original Project Document to \$1,002,811 in the last revision. This was due to increases in the post adjustment of the experts, and in the cost of equipment and fellowships. Annex II shows the changes in the UNDP inputs in the various revisions of the project.

The total government inputs during the project amounted to LS 7,210,325, this is LS 1,440,000 less than the figure given in the Project Document, but the Government's financing of the buildings should be mentioned. In general, the government financial contribution was satisfactory.

## I. FINDINGS

The new project started in January 1974, on the arrival of the Project Manager. The Project Manager was introduced to counterpart personnel, and links were established between IRDC and the various industrial operations in the country. A list of the plants visited by Project Manager, experts and counterparts is given in annex IV.

### A. Installations

In January 1974, the Centre was housed in an apartment of seven rooms, packed with the desks of its staff. Fortunately, a new building for the Centre was under construction and approaching completion.

The Centre gradually moved into the new building during the second half of May 1974. Equipping the premises with necessities like gas, air-conditioning and telephones delayed the start of laboratory activity until October 1974. Training of counterparts in testing and analysis took a further three months, and the Centre was finally able to carry out work for Syrian industrial concerns at the beginning of 1975. A list of tests carried out at the Centre is given in annex VI.

The new building comprises a basement and two floors. The basement originally housed the workshop and mechanical testing laboratories, a cement laboratory, an air-conditioning control unit, a telephone exchange, and an electrical switching room. The first floor housed the administration, and had rooms for metrology, standardization, the library and documentation services, the electrical calibration and testing laboratory, a non-destructive testing laboratory and some storage rooms. The second floor housed the inorganic chemistry laboratory, the physical metallurgy laboratory, the textile laboratory, special laboratories for leather, paper, plastics and rubber, stores for chemicals, and some staff rooms. The whole building was air-conditioned with various controls specific to each laboratory.

In 1975, three more buildings were started: the administration building, the pilot-plant building, and a lecture theater. The construction of these buildings took a long time due to the incomplete design and the sub-division of the contract among different builders. Only one building is ready; this is the administration building, which now houses the administration offices

together with the standards and documentation sections. The building was occupied in June 1977. The pilot-plant building is almost ready, with some pilot equipment already erected. The lecture theater may be delayed because of the necessity to call for offers for the supply and construction of the flooring, seats and cinema. It is expected to be ready for use in 1978.

Equipment for the establishment of a calibration service was delivered gradually until 1976. Various proposals were submitted to activate this service; they are awaiting execution.

The workshop that is now in the basement of the main building is a general mechanical and electrical workshop. The technicians are still being trained; some have left the Centre. However, the skill of those at the Centre is far below the level necessary to handle sophisticated equipment. A new workshop building is under construction and is due for completion before the end of 1977. This new building will contain shops for mechanics, woodwork, painting, electrical work, fine mechanics, welding and tinsmithery. In view of the importance of the fine mechanics shop for maintenance and repair in the Centre, this activity should be stressed in the second phase of the project through the provision of one or more experts in fine mechanics and a few fellowships. Due to the shortage of technicians in fine mechanics in Syria, it is intended to invite industrial concerns to send some of their personnel to the Centre to gain training during the presence of the expert or experts.

Construction of a laboratory for mechanical testing and research is expected to start in 1978. The project area is big enough to accommodate further expansions for at least ten years. The Centre has its own artesian well and elevated water tank, which supply the laboratories. Drinking water, however, is still brought every day to the Centre from the town water supply by lorry. The standard of cleanliness of the Centre has always been very high.

#### B. United Nations assistance

##### International staff

The Project Document expert component was slightly modified due to the cancellation of cost accountancy from the activities of the Centre; this was done to avoid duplication of the work of the "Management Development Centre" set up by the State Planning Commission. The man-month provision

provision was partially transferred to fund a textile expert for nine months. The balance of man-months was added to the provision for short-term consultants, which helped to fill some important gaps in this multi-purpose project. The entire allotment for experts was used, except the provision for an expert in mechanical testing, who is expected to arrive soon for three months, and for an expert in spectrography, also for three months.<sup>1/</sup>

The arrival of most of the UNIDO experts coincided with the initiation of the fourth Syrian Five-Year Development Plan (1976-1980). This five-year plan is of relatively large scope, with an envisaged total investment in the field of industry alone of LS 11,300 million.

UNIDO experts, assisted by counterparts, engaged in consultancy activities, especially in the following fields: choice of technology and appropriate know-how; projected capacities; choice of sites for projects; and local foodstuffs, products and their specifications. Syrian authorities appreciated the assistance of the Centre in this direction.

Trouble-shooting activities were carried out by all UNIDO experts, together with their counterparts. Their efforts in this respect were much appreciated. Annex XIII lists the trouble-shooting activities performed.

Some preliminary research was performed, including studies of the suitability of local materials for the preparation of pesticides, and research connected with the packaging industry. However, the main research effort is expected to start at a later stage in the project, after the pilot plant starts functioning and after the counterparts have been trained in testing and analysis to a very high level. Without such training, research would be valueless. It is thus expected that research will be an important activity in the second phase of the project. Annex XV shows the assistance to industry rendered via consultations on new projects.

In general, the international team of experts did a very good job; they created a co-operative spirit with their counterparts and left a good impression in the Centre. The quality of personnel available necessitates more experts and in some cases, missions of longer duration. Annex VIII lists the experts and local staff of the Centre.

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<sup>1/</sup> As of February 1978, these experts have completed their work.

#### Sub-contracts

When the project started in January 1974 it inherited a sub-contract with AFNOR, the French Association for Standards. This contract was cancelled and the last AFNOR expert left the Syrian Arab Republic early in March 1974.

#### Training provisions

According to the Project Document, ten fellowships were approved. However, during the tripartite meetings it was deemed necessary to change the number and specifications of the fellowships to suit the needs of the Centre, while keeping the total number of man-months the same. The execution of this component was delayed due to (a) the difficulty of finding suitably qualified personnel for the Centre; (b) the difficulty of finding candidates with a reasonable proficiency in a foreign language; (c) the financial position of UNDP forcing the shifting of five fellowships to 1977, the last half year of the project; and (d) the delay in placement of the fellowships abroad. However, all the fellowships have either been executed or at least have candidates nominated for them. Annex IX shows the fellowships executed, in execution and awaiting placement.

#### UNDP supplies and equipment

The original budget for this component in the Project Document was \$243,000 but it was increased gradually to \$269,000. Finally, to cover the cost of urgently needed spare parts, \$9,800 was shifted from the fellowship component to the equipment component to make the total equipment figure \$279,890.

Orders for the whole equipment budget were sent to UNIDO before the end of 1975. Procurement and shipping, however, extended into 1976. The last deliveries are still being expected; they consist mainly of spare parts, and are valued at \$5,000. The equipment delivered by UNDP/UNIDO was appropriate for the various activities of the Centre. Unfortunately, some of the equipment arrived damaged due to unseaworthy packing or improper handling in Syrian ports. However, all the damaged equipment was repaired and put into operation.

#### Administrative support

A secretary and a driver were appointed at the start of the project. They fulfilled their duties very well, and should be kept for the second phase of the project.

### Assessment

Tripartite meetings were held every year, and were felt to be very fruitful indeed. During these meetings, the fulfilment of UNDP/UNIDO and government obligations was discussed thoroughly. The progress of implementation of the project was also discussed. An in-depth evaluation mission composed of representatives of UNDP and UNIDO visited the project in January 1977.

In general, UNDP/UNIDO executed all their obligations as regards inputs, except for two short-term experts, some spare parts, and the unfilled fellowships mentioned.

### Difficulties related to United Nations assistance

Recruitment of experts. Generally a rather long time elapsed between the nomination of experts and their arrival at the duty station, and this delayed the start of some activities. The industrial economist, for example, arrived at the duty station in November 1975, in mid-project. In spite of this delay, the Project Manager started to train the first counterpart appointed to the techno-economic section by initiating a prefeasibility study (see annex XIV). The arrival of the industrial economist coincided with the appointment of new counterpart personnel, and more active training started. Throughout the project, the techno-economic section was supervised personally by the Project Manager in the absence of a director. Other experts that arrived late included the textile laboratory and electrical laboratory experts.

Equipment. The procurement of equipment was a slow process. Some equipment arrived a year, or even longer, after the requisition was sent to UNIDO. This led to delays in the installation of equipment and in the training of counterparts.

Placing of fellowships. This was also a very slow process. Two candidates were nominated for fellowships in March 1976, but the fellowships were only executed in May and July 1977. Placement was delayed in some cases, even though the place of training was selected by the Project Manager or the Director of the Centre.

UNDP financial constraints. This factor led to five fellowships being postponed to the last six months of the project, which, given the difficulty of recruiting the right persons and the delay in placement, made it impossible to execute the remaining fellowships before the end of the project.

### C. Counterpart performance

#### Personnel

The Project Document manning table shows a counterpart staff of 50 persons. This number proved to be too small for a multi-purpose project of this calibre. The total rose to 109 persons, but still more are needed. Thirty-one of the total are non-scientific staff, such as guards, cleaners, drivers, gardeners, and messengers. The official working hours in the Syrian Arab Republic are from 0800 hours to 1430 hours. When one considers the lack of relevant previous experience of most of the counterparts, and the loss to the Centre of personnel through conscription and fellowships, it becomes clear that the number originally envisaged was too small.

Due to the low scale of salaries, the total staff pay came to about half the total sum allotted in the Project Document. The low salary scale was a major obstacle to the appointment of qualified personnel and this, in turn, impeded the rate of implementation of the fellowships and other objectives. Annex VIII lists the personnel of the Centre and their classifications.

#### Equipment and deliveries

The figure given for this item in the Project Document is LS 3,950,000; the actual expenditure was much less. The deliveries, which included chemicals and materials, always covered the needs of the Centre. The equipment delivered also included units for the pilot plant. The usual procedure for ordering of equipment from abroad is lengthy: first there are calls for offers (three are required); then one is selected and approved; the contractor must then get an import permit and the foreign currency required, and open a letter of credit; the equipment or supplies then have to be produced abroad and shipped to the Syrian Arab Republic; the final stage is customs clearance and local transportation to the Centre.

#### Buildings

This item was not included in the budget of the Project Document. However, it amounted to LS 3,285,321 during the 3½ years of the project. This does not include the cost of the original main building. The contribution of the Government here was more than satisfactory.

Difficulties related to counterpart performance

Personnel. The country is in general short of highly qualified engineers and chemists. Trained engineers and chemists are not attracted by Government-run projects like IRDC because they feel they will not gain adequate recognition for their work and that salaries will not conform to their experience and skills. Highly qualified personnel tend to prefer the private sector, which pays according to efficiency and output. As a result, the Centre was only able to attract staff who needed lengthy training before assuming full responsibilities at the Centre. Even at this level, there was a distinct shortage of staff. As part of their training counterparts attended regional meetings related to documentation and standards and other activities. It is expected to arrange lecturing activities during the second phase of the project when the number of staff increases and the new lecture theatre is completed.

Language proficiency. It is very difficult to find Syrian engineers or chemists with linguistic abilities. Engineers who have studied abroad usually prefer to work in the private sector. This made it difficult to find engineers or chemists suitable for fellowships. Language problems in general hampered implementation by causing an inefficient use of technical literature. To remedy this situation, the Project Manager and the General Director of the Centre gave the staff tuition in technical and scientific English.

Scale of salaries. According to the Project Document the Board of the Centre is empowered "to establish scales of salaries and conditions of service, so as to ensure full-time and continuous service of counterpart staff". The scale of salaries applied in the Centre was the standard government scale. When the Resident Representative and the Project Manager raised the question of the low salary scale during the first tripartite meeting, they were informed that the introduction of a different scale of salaries would cause dissatisfaction among professional personnel in the Government. Trials were carried out to find other incentives; it was stated that one quarter of the income of the Centre from its services would be paid as incentives. Still more incentives are needed to attract personnel of a sufficiently high quality.



Conscription. Compulsory military service is deferred for university students until after graduation. Accordingly, when a newly qualified engineer or chemist is appointed to the Centre, he usually stays a few months then goes on military service for  $2\frac{1}{2}$  years. In some cases, a counterpart was not able to get the full benefit of expert assistance because he was called up before the end of the expert's mission. Even when the counterpart did stay for the duration of the expert's mission, he generally was called up soon afterwards, as a result of which his section was depleted and he needed retraining upon his return  $2\frac{1}{2}$  years later. Requests that service with the Centre should be counted as being equivalent to military service, or that staff appointed to the Centre should first be allowed to complete their military service, were refused.

Final clearance of experts. After the nomination and approval of an expert, government clearance took about three months. This delay occasionally meant that the expert was no longer available; either a new candidate had to be found, or implementation had to be delayed until the expert was again available.

Legislative decree. According to the Project Document, a legislative decree for the establishment of the Industrial Research and Development Centre should have been enacted. This Decree has still not been enacted. The objectives of the project had to be implemented under the legislative decree formalizing the old project (Industrial Testing and Research Centre). This did not cause much difficulty. However, a new decree with the new name and objectives of the project is essential. The last draft of the proposed decree bore the title "The Industrial Testing, Research and Development Centre". The Syrian authorities feel that, since the Centre is already known as the "Testing Centre", removing the word "Testing" from the title would affect the Centre's identity. The Project Manager has no objection to this new title, so long as the text of the decree incorporates a statement of the duties and activities agreed upon in the Project Document.

Board. A board was appointed in mid-1975 under the old decree. It is headed by the Minister of Industry, and is composed of government officials, and representatives of the University of Damascus and the Chambers of Commerce and Industry. There are no representatives of industrial organizations, and it is hoped that this will be rectified in the new decree. At present, the Board meets every three months or so, but a monthly meeting would be more appropriate.

D. Standards

The Centre is a member of the Arab Standards and Metrology Organization (ASMO), and of the International Standards Organization (ISO). The standards section in the Centre maintains the full standards documents of a number of national organizations. Annex X lists the standards elaborated by this section during the project.

A technical committee is organized for each standard, comprising personnel from the Centre, the appropriate government organization, and competent technical personnel from the public and private sectors.

The permanent standards committee is chaired by the Minister of Industry and has 14 members. The General Director of the Centre serves as the Deputy Chairman of the committee, which also includes members of ministries concerned with the standards. After the approval of a standard by a technical committee, the proposed standard is sent to bodies engaged in the production or control of the article concerned. Comments on the proposed standard must be communicated to the Centre within two months. These comments are then studied by the technical committee and used in the preparation of the text for the final approval by the permanent committee. The Minister of Industry then issues the necessary decree.

As yet, no certification mark is in force, owing to the limited number of fully approved standards. It is expected that a certification mark will be introduced in the near future.

## II. CONCLUSIONS AND RECOMMENDATIONS

### A. Conclusions

The Project Document gave specific dates by which objectives were to be started. This schedule proved impossible to follow because (a) the official approval of the Project Document was delayed for about half a year, and consequently the project was delayed for the same period, (b) the execution of the building housing the Centre was delayed, (c) UNIDO experts on occasion arrived late, and (d) there were delays in appointing counterparts.

The main problems encountered were as follows:

1. This was a multi-purpose project with diversified activities, including: setting standards; establishing quality control and metrology laboratories; trouble-shooting; providing consultation and information services; undertaking prefeasibility and feasibility studies; and research and development. It was difficult to achieve a reasonable level of implementation of all these activities in the short time allotted.
2. Some activities needed a particularly long time to implement properly. For example, training young chemists to operate modern laboratory equipment and to interpret accurately and decisively the results obtained in such fields as spectrography, gas chromatography, and infra-red and atomic absorption spectrophotometry.
3. A grounding in quality control is necessary for all research staff, particularly for those who are to help industrial units set up their own quality control systems.
4. To speed up implementation, sufficient good scientists are needed. The lack of such staff was noted by all UNDP project managers in the country. This means delays due either to late appointment of qualified staff or to the substantial time needed to train inexperienced staff.
5. The execution of fellowships was delayed due to delays in the appointment of counterparts.
6. The slow rate of delivery of equipment, especially of locally supplied equipment, retarded the rate of implementation.

7. Some activities, such as documentation, were not adequately supported during the first phase of the project and will need further assistance. The fine mechanics workshop will also need real assistance, especially after the completion of the new workshops. A new mechanical testing and research laboratory should be ready for use in 1978; this will also need UNIDO assistance to operate properly.

8. Poor counterpart staffing and the lack of appropriate UNIDO assistance retarded the establishment and development of a technical information service for local industry. This activity would need further assistance in the form of one or more experts and some fellowships. The main efforts in this direction should be devoted to (a) screening, classifying and abstracting incoming information for use within the Centre and by industry; and (b) establishing an inquiry and advisory service for industry, and providing liaison to the UNIDO industrial clearing house of information.

Most of UNIDO assistance to Syrian industry should be channeled through the Centre; any future centres for assisting a sub-group of industry should be extensions of the present Centre. Creating new units within the Centre rather than new centres for individual industries (such as the plastics and food industries) would help to utilize the Centre's testing and analysis laboratories, documentation department and scientific and technical personnel to the full.

The ambitious Syrian industrialization programme requires the Centre's training capabilities, control equipment, and maintenance personnel. The Centre is also expected to train persons who will, in turn, assume training responsibilities in the training centres planned by the Government. This will be feasible after the completion of the new lecture theatre.

In spite of the achievements of the project, there is a need for a second phase.

#### B. Recommendations

1. A second phase of the project of three years should be implemented as soon as possible, so as to maintain continuity. A long delay might lead to a slow-down in the activities of the Centre.

2. In view of the conditions prevailing in the Syrian Arab Republic as regards the quality of professional personnel, and of the multi-purpose nature of the project, there should be a generous allotment of man-months for experts to help establish activities and to train the Centre's personnel.

3. As it is very difficult to foresee the actual needs of the second phase as regards experts and short-term consultants, it is recommended that half of the man-month allotment be left unidentified.

4. It is recommended that fellowships be left unidentified, since their precise nature will depend on the quality and experience of the personnel recruited to fill them.

5. It is recommended that the Centre should inform industry about its activities through visits to works and factories during the early months of the second phase. Documentation on the Syrian industry should be updated during these visits.

6. The Legislative Decree formalizing the Centre should be enacted as soon as possible; the Board of the Centre appointed according to the new Decree should include representatives of industrial organizations.

7. The Project Manager for the second phase should be a scientist with some experience in research and feasibility studies, and not an industrial economist as suggested by the evaluation mission. This is because six of the seven main objectives of the Centre are technical in nature, and the second phase should emphasize research, fine mechanics, plastics and food technology. As regards expert staffing in the second phase, two experts are needed for the fine mechanics workshop: one in mechanics, and one in electronics. (The evaluation mission suggested that only one expert was needed.)

8. Faster provision of equipment and experts and faster placement of fellowships is necessary in order to implement the project in the limited period of three years.

9. The Centre should arrange a course in the English language for professional personnel, so as to improve their utilization of the library and otherwise to facilitate the execution of fellowships. Perhaps there should be some form of incentive associated with the language course to obtain the best results.

Annex I

TERMS OF REFERENCE OF THE PROJECT MANAGER

The terms of reference of the Project Manager were as follows:

- To assist in setting up and operating the Centre
- To advise local executives and researchers on managerial and professional matters
- To participate in establishing strong ties between the Centre and industries and assist in developing advisory services to be presented by the Centre to industries
- To participate actively in planning and implementing the Centre's activities including advisory and consulting services to industry and elaboration of practical development programmes with special emphasis on the chemical and processing industries
- To be responsible for co-ordination of the work of the international team
- To report to UNIDO on the progress of operations

Annex II

MAJOR UNDP INPUTS PROVIDED FOR IN THE PROJECT DOCUMENT (P.D) AND ITS REVISIONS (P.REV.)

| Major component             | P.D. Rev. 1973<br>Rev. May 1974 | P.Rev.<br>March 1975 | P.Rev.<br>May 1975 | P.Rev.<br>June 1975 | P.Rev.<br>Dec. 1976 | P. Rev.<br>July 1977 |
|-----------------------------|---------------------------------|----------------------|--------------------|---------------------|---------------------|----------------------|
| Experts (m/m)               | 140                             | 146                  | 146                | 146                 | 145                 | 146.7                |
| Administrative support (\$) | 27 500                          | 27 500               | 27 500             | 27 500              | 36 609              | 39 489               |
| Sub-contracts (\$)          | 90 000                          | 90 000               | 71 800             | 48 956              | 48 956              | 48 956               |
| Fellowships (m/m)           | 76                              | 50                   | 50                 | 62                  | 72                  | 64                   |
| Group training (\$)         | -                               | -                    | -                  | 1 800               | 5 920               | 6 678                |
| Equipment component (\$)    | 245 000                         | 245 000              | 263 000            | 269 000             | 269 000             | 279 890              |
| Miscellaneous (\$)          | 19 300                          | 19 300               | 19 300             | 17 300              | 19 209              | 19 209               |
| Mission costs (\$)          | -                               | -                    | -                  | 4 000               | 4 840               | 4 840                |
| Travel costs (\$)           | -                               | -                    | -                  | -                   | 6 230               | 684                  |
| Total (\$)                  | 776 000                         | 852 150              | 852 150            | 851 056             | 1 003 984           | 1 002 811            |
| Planned termination         | Dec. 1976                       | July 1977            | July 1977          | Aug. 1977           | July 1977           | Aug. 1977            |

Annex III

MAJOR ITEMS OF EQUIPMENT RECEIVED

| Description   | US \$<br>equivalent | Received |      |
|---|---------------------|----------|------|
|   |                     | Month    | Year |
| Vehicle: Mercedes-Benz, model 220   | 3 657               | 07       | 72   |
| Double-beam optical null infra-red spectro-<br>photometer   | 12 030              | 10       | 74   |
| Chromatograph, model Girdel 75/CD/PT  | 8 675               | 09       | 74   |
| Spectrograph, model Jarrel-Ash wide-angle<br>Wadsworth stigmatic spectrograph   | 4 350               | 08       | 75   |
| Arc and spark stand, convertible to Petrey<br>stand   | 2 800               | 08       | 75   |
| Spectro - varisource, model Jarrel Ash, in<br>horizontal cabinet, with all the required<br>timers, pilot lights, switches, meters etc.,<br>and with 3" oscilloscope | 6 650               | 08       | 75   |
| Digital console comparator microphotometer  | 11 230              | 08       | 75   |
| Photoprocessor, model Jarrel-Ash, including<br>thermostatically controlled tanks for<br>developer and fixer   | 2 650               | 08       | 75   |
| Atomic absorption spectrophotometer, model<br>305 B   | 9 435               | 12       | 74   |
| Temperature recorder, model Z9CT-F  | 2 694               | 10       | 75   |
| Sound and vibration set, model 3501   | 3 457               | 11       | 75   |
| Digital indicator, model SDT-100A   | 3 096               | 03       | 76   |
| Measuring gauge, stainless steel with gauges<br>for 50 l, 100 l and 200 l (2 each)  | 11 015              | 01       | 76   |
| TONSEE Universal testing machine, model NAT-<br>100   | 20 290              | 04       | 76   |
| Contracer, model number 218-901 for 220<br>volts/50 Hertz   | 5 878               | 06       | 76   |
| Balance masses in case, 2 series, x 2   | 6 667               | 06       | 75   |



Annex IV

VISITS TO ORGANIZATIONS AND PLANTS

Adra

Sugar factory

Aleppo

Plastics factory

Accumulators Batteries

Vegetable-oil factory

University Chemistry Faculty

Cement factory

Tractor factory

Tannery Company

Beirut

Industrial Research Institute

Bloudan

Mineral bottling plant

Damascus

Arabian Company for manufacturing soap and detergents

Barada Cable Company

Cement factory

Chocolate and biscuit factory

Camelia Biscuit Factory

Corrugated board and box factory

Conserve factory

Debes Factory

Dairy and Deriwate factory

Glass factory

Glass containers factory

Ghraoui Factory

General Organization for Food Industries

General Organization for Grains and Mills

Harasta Institute

Damascus (continued)

Medical Preparation  
Metal Construction and Mechanical Industries Company  
Milk sterilizing plant  
Orient Knitwear Manufacturing Company  
Paints factory  
Plastic Shoe Factory  
Philips Moyen Orient  
Refrigerator Company  
Sugar factory  
Textile Testing and Design Centre  
Textile factory ("Modern Industries Corporation")  
TAFCO  
Yeast factory

Hama

Cement factory  
Ceramics Company  
Vegetable-oil factory  
Cotton Yarns Corporation  
Steel-rolling mill  
Wool-grading Centre

Homs

Fertilizer plant  
Petroleum refinery  
Corporation for Spinning, Weaving and Dyeing  
Nitrogen fertilizer plant

Lattakia

Arab Timber Manufacturing Company  
Cement factory  
Chipboard Company  
Electric Motors Company

Mesalmen

Shahba Cement

Rastan

Cement factory

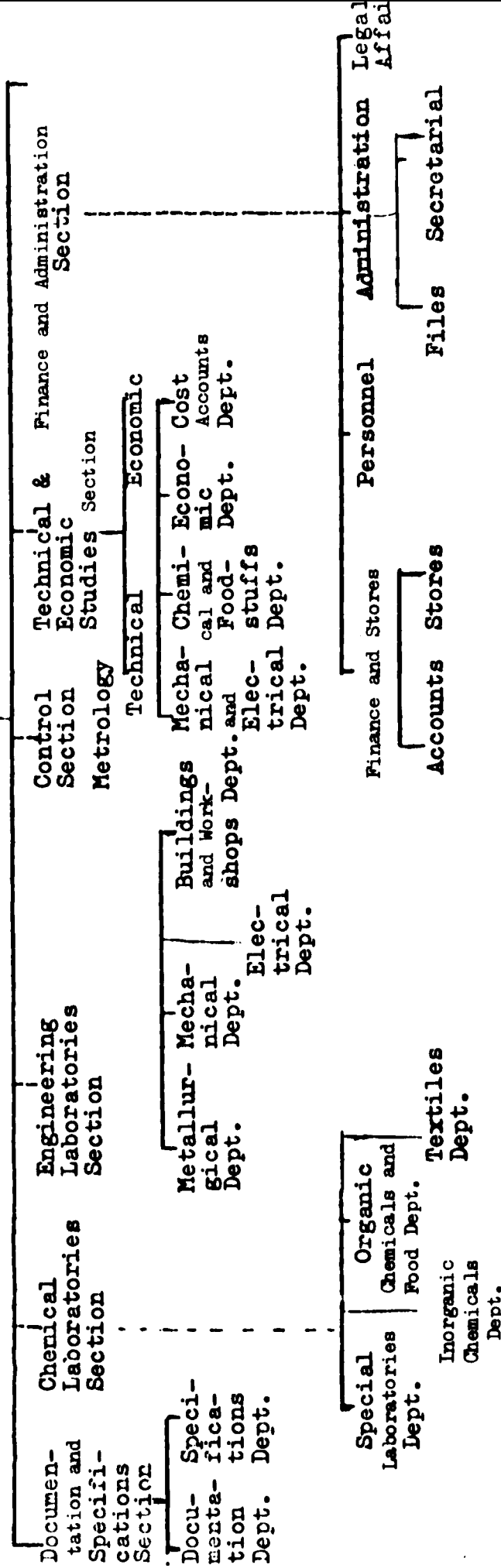
Sheikh Saeed

Shahba Cement

Annex V

ORGANIZATION CHART

General Manager



Annex VI

ANALYSES AND TESTS CONDUCTED AT THE CENTRE

1. Calibration of test masses at the Cement Factory, Musulmiyeh, for several newly installed bridge weighing machines for road vehicles ranging up to 10 ton capacity.

2. Tests on PVC-shoe material. Tests on shoes produced under the control of the Centre using the original material were carried out to find a method for identifying imported raw materials.

3. In a court case, the identity of polyethylene pipe-material and the specifications of imported raw material had to be proved.

4. About 200 tensile strength tests and hardness tests on various metals and alloys imported by AFTOMETAL, the Foreign Trade Organization for Metals and Building Materials.

5. Synthetic filament yarn strength tests.
6. Fibre identification by chemical means.
7. Twist testing.
8. Fabric tensile strength testing.
9. Shrinkage tests for knitwear.
10. Crimp and loop measurement in knitwear.
11. Solubility of polypropylene for identification purposes.
12. Colour fastness to washing.
19. Experiments in measurement of whiteness in bleached fabrics.
20. Evenness and imperfection measurements in cotton yarns.
21. Fire resistance tests.
22. Crease recovery tests.
23. Quantitative of chemical analysis of wool/polyester mixtures.
24. Analysis of woven fabrics.
25. Linear density of yarn from woven fabrics.

26. Fibre sorting by chemical methods.
27. Wool fibre diameter measurements by microscope.
28. Fibre counting technique for determining percentage blend in yarns.
29. Relaxation shrinkage tests.
30. Spun yarn strength tests.
31. Water absorbancy tests.
32. Water penetration of woven canvas fabrics.
33. Fabric strength tests.
34. Resistance to tearing tests.
35. Fastness to light tests.
36. Fastness to weather tests.
37. Dimensional stability tests.
38. Test of the pH of water extracted from bleached textiles.
39. Use of standard grey scales for colour fastness testing.
40. Colour fastness to hot pressing test.
41. Colour fastness to sea water test.
42. Colour fastness to perspiration test.
43. Colour fastness to water spotting.
44. Colour fastness to bleaching.
45. At the request of local firms and organizations the following industrial analyses and tests were performed:

| <u>No. of samples</u> | <u>Item</u>       |
|-----------------------|-------------------|
| 56                    | Iron ore          |
| 60                    | Clay              |
| 25                    | Water             |
| 10                    | Unknown materials |
| 65                    | Metal             |
| 82                    | Paper             |

| <u>No. of samples</u> | <u>Item</u>                  |
|-----------------------|------------------------------|
| 2                     | Mazut-deposit                |
| 6                     | Detergents                   |
| 8                     | Soap                         |
| 6                     | Edible oils                  |
| 2                     | Cement                       |
| 1                     | Pectin                       |
| 1                     | Olive oil                    |
| 15                    | Milk powders                 |
| 7                     | Biscuits                     |
| 1                     | Pesticides                   |
| 3                     | Bleaching powder             |
| 5                     | Raw sugar                    |
| 2                     | Wheat                        |
| 10                    | Butter                       |
| 5                     | Palm oil                     |
| 5                     | Glass                        |
| 2                     | Hydrogenated oil             |
| 5                     | Non-woven textile            |
| 5                     | Naphta                       |
| 28                    | Empty cans                   |
| 8                     | Sodium perborate             |
| 1                     | Sodium chloride              |
| 1                     | Polyethylene bag             |
| 1                     | Polyethylene barrel          |
| 1                     | Water                        |
| 1                     | Rubber ring                  |
| 18                    | Cans                         |
| 11                    | Animal feed                  |
| 11                    | Cereals                      |
| 18                    | Polymers                     |
| 4                     | Starch                       |
| 20                    | Microbiological examinations |

Annex VII

EXCERPT FROM LEGISLATIVE ACT NO. 71 (25.3.1965)

- Article 1: A Centre is hereby established in the Syrian Arab Republic called "The Centre for Testing and Industrial Research". This Centre is to have the status of a general organization enjoying administrative and financial autonomy, to be attached to the Ministry of Industry, to be located in Damascus with the right to carry out its activities in all areas of the Syrian Arab Republic.
- Article 2: The objectives of the Centre are: carrying out technical studies for industrial projects; preparation of studies related to technical specifications, standardization and metrology; carrying out analyses and testing of raw materials and manufactured products as well as applied research in the different industrial fields, and work necessary for the development of the programmes of the industrial development organizations, co-ordination of these programs and providing techno-economic industrial consultancy services. To achieve these objectives the Centre shall carry out the following tasks:
1. Testing and analysis activities.
  2. Industrial studies and research.
  3. Studies and research related to raw materials and other materials, aimed at identifying their characteristics, determining their applications and providing the basis for their utilization.
  4. Rendering technical and economic consultancy services to existing and planned industries.
  5. Rendering internationally recognized services in the fields of testing, analysis and standards for materials and products as well as issuing certificates of analysis, quality certificates and certificates of conformity with standard specifications.
  6. Co-operation with the government and non-government organs, industrial organizations, as well as foreign organs in all matters related to the industrial development of the country.
  7. Publication of industrial studies and research in accordance with the internal regulations of the Centre.
  8. Training technicians in all fields of the Centre's activities.

Annex VIII

PROJECT PERSONNEL

| Budget line | Name            | Job description                           | Arrival                | Departure              | Total man-months |
|-------------|-----------------|---|------------------------|------------------------|------------------|
| 11-01       | M.A. Shaaban    | Project Manager<br>(Chemical Industries)  | Jan. 1974              | Aug. 1977              | 43.0             |
| 11-02       | Dieter Köttgen  | Mechanical Production Engineer            | Mar. 1974              | Feb. 1976              | 24.1             |
| 11-03       | Oscar Kvaale    | Food Processing                           | Nov. 1974<br>Sep. 1976 | Oct. 1975<br>Nov. 1976 | 14.0             |
| 11-04       | T.S. Abida      | Industrial Economist                      | Oct. 1975              | July 1977              | 21.6             |
| 11-05       | Jack Woolfenden | Textile Testing                           | Nov. 1976              | July 1977              | 9.0              |
| 11-06A      | M. Parkany      | Instrumental Methods of Chemical Analysis | Jan. 1975              | July 1976              | 18.0             |
| 11-06B      | M. Ipacs        | Electrical Calibration                    | Nov. 1976              | May 1977               | 6.0              |
| 11-06C      | (expected)      | Material Testing Expert                   | -                      | -                      | 6.0              |
| 11-06D      | P. Herard       | Packaging Industries                      | Feb. 1977<br>May 1977  | Mar. 1977<br>June 1977 | 2.0              |
| 11-06E      | (expected)      | Spectrograph Expert                       | -                      | -                      | 3.0              |
| 13-01       | Leila Muwakki   | Administrative Assistant                  | Jan. 1974              | -                      | -                |
| 13-02       | A.N. Aphemoghat | Driver                                    | Jan. 1974              | -                      | -                |



Annex IX

FELLOWSHIPS AND GROUP TRAINING

| Budget line  | Subject                             | Recipient     | Duration (months) | Year scheduled | Actual starting date | Actual completion date | Remarks   |
|--|-------------------------------------|---------------|-------------------|----------------|----------------------|------------------------|---|
| <u>Fellowships executed</u>                              |                                     |               |                   |                |                      |                        |   |
| 31-06  | Machine Tools and Welding           | Y. Thalgeh    | 7                 | 1975           | 29.11.75             | 30.7.76                | Extended to 8 months                                      |
| 31-08  | Construction Materials              | W. Rifai      | 6                 | 1975           | 3.11.75              | 30.5.76                |   |
| 31-10  | Feasibility Studies                 | S. Adwan      | 6                 | 1975           | 17.11.75             | 16.4.76                | Returned one month earlier than scheduled                 |
| 31-11  | Plastic and rubber                  | M. Kaisaniyeh | 6                 | 1976           | 1. 1.77              | 3.7.77                 |   |
| 31-14  | Textile testing                     | H. Boshi      | 6                 | 1976           | 1. 5.77              | -                      | Not yet completed   |
| <u>Fellowships already nominated but not yet started</u> |                                     |               |                   |                |                      |                        |   |
| 31-05  | Pilot plant                         | F. Kadri      | 7                 | 1976           |                      |                        | Delayed due to illness; expected to start 1 August 1977   |
|  |                                     |               | 2                 | 1977           |                      |                        |   |
| 31-15  | Technical Information/Documentation | F. Abiad      | 2                 | 1977           |                      |                        | Placement awaited   |
| 31-16  | Technical Information/Documentation | A. Habash     | 2                 | 1977           |                      |                        | Placement awaited   |
| 31-17  | Pesticides analysis                 | M. Abazeid    | 2                 | 1977           |                      |                        | Replacing 1 month study tour of Centre's General Director |
| 31-18  | Spectrographic analysis             | W. Kokash     | 2                 | 1977           |                      |                        | Replacing part of 31-03                                   |
| 31-07  | Laboratory equipment maintenance    | S. Talo       | 6                 | 1977/1978      |                      |                        |   |

| Budget line                              | Subject                             | Recipient   | Duration (months) | Year scheduled | Actual starting date | Actual completion date | Remarks                                       |
|--|-------------------------------------|---|-------------------|----------------|----------------------|------------------------|---|
| <u>Fellowships cancelled or replaced</u> |                                     |   |                   |                |                      |                        |   |
| 31-01                                    | Library and Technical Documentation | (replaced by 31-15 and 31-16)                                     |                   |                |                      |                        |   |
| 31-02                                    | Cancelled                           |   |                   |                |                      |                        |   |
| 31-03                                    | Food Processing (sugar)             | (cancelled to finance AICHEMA participation, budget line 32-03)   |                   |                |                      |                        |   |
| 31-04                                    | Electrical Industry and Testing     | (cancelled - funds shifted to equipment component)                |                   |                |                      |                        |   |
| 31-09                                    | Laboratory Administration           | (cancelled to finance 2-month extension for both 31-05 and 31-14) |                   |                |                      |                        |   |
| 31-13                                    | Food Processing (canning)           | (cancelled to finance 31-18)                                      |                   |                |                      |                        |   |
| <u>Group Training - Executed</u>         |                                     |   |                   |                |                      |                        |   |
| 32-01                                    | Interregional Training Workshop     | S. Adwan  | 18 days           | 1975           | 23.6.75              | 12.7.75                |   |
| 32-02                                    | Study Tour                          | Z. Sawaf  | 2                 | 1976           | 18.9.76              | 18.10.76               | The second month replaced by fellowship 31-17 |
| 32-03                                    | ACHEMA Participation                | Hakki, Dabbik, Makhouli, Kadri                                    | 7 days each       | 1976           | 20.6.76              | 26.6.76                |   |

Annex X

SYRIAN NATIONAL STANDARDS EXECUTED, 1974 - 31 JULY 1977

| <u>National Standard<br/>number</u> | <u>Title</u>   |
|-------------------------------------|--|
| 46-1974                             | Standard methods for testing and analysis<br>of drinking water   |
| 52-1974                             | Superphosphate fertilizer  |
| 47-1976                             | Non-alcoholic beverages  |
| 50-1976                             | Part 1: Basic SI quantities and units of<br>space and time<br>Part 2: Quantities and units of periodic<br>and related phenomena<br>Part 3: Quantities and units of mechanics<br>Part 4: Quantities and units of heat |
| 53-1976                             | Fresh tomatoes   |
| 54-1976                             | Grape  |
| 55-1976                             | Pears  |
| 56-1976                             | Cucumbers  |
| 57-1976                             | Vegetable marrows  |
| 58-1976                             | Aubergines   |
| 59-1976                             | Onions   |
| 60-1976                             | Potatoes   |
| 61-1977                             | General terms for fresh fruits and vegetables  |
| 62-1977                             | General terms for fruit and vegetable boxes  |
| 63-1977                             | Apples   |
| 64-1977                             | Citrus fruits  |
| 65-1977                             | Fresh fruit and vegetable sampling   |
| 66-1977                             | Installations and fittings for liquified<br>petroleum gas (LPG)  |
| 67-1977                             | Premium gasoline   |
| 68-1977                             | Gas oil  |
| 69-1977                             | Conditions for filling and handling of<br>LPG cylinders  |
| 70-1977                             | Labels of prepacked and canned foods   |

Annex XI

DEVELOPMENT OF DOCUMENTATION DEPARTMENT, 1974-1976

| Year | No. of books | No. of periodicals | Expenditures for books and periodicals (LS) |
|------|--------------|--------------------|---|
| 1974 | 511          | 32                 | 37 126.26                                   |
| 1975 | 817          | 66                 | 45 138.30                                   |
| 1976 | 1 205        | 104                | 46 400.00                                   |

Annex XII

TROUBLE-SHOOTING ACTIVITIES

1. Investigations of the heat treatment problems at Barada Company, Damascus. The hardness of the work pieces was found to be insufficient. It was recommended that the provisional hardening arrangements should be replaced by annealing and normalizing supplemented by hardness-controlling instruments. Accordingly, a technically satisfactory heat treatment shop was provided for the new Barada extension project.

2. Assistance to the Fertilizer Plant, Homs. When erecting the new ammonia pressure sphere, the factory was confronted with problems. We checked all relevant standards and codes and found an applicable provision according to which heat treatment after cold forming is not needed as long as the maximum fibre elongation does not exceed a certain limit. The erection of the spheres was continued.

3. The cyclone layout of the Arab Timber Manufacturing Company, Lattakia, was checked. Samples of wood dust were taken and analysed at the Centre. We came to the conclusion that the cyclon was capable of doing the job, but the operational conditions might have deteriorated. We recommended that the whole installation should be checked for deposits, leakages, ventilatory damage etc. No further complaints about the system were heard.

4. At the request of UNICHEM, difficulties experienced by the Plastic Shoe Factory, Damascus, with the PVC granules were studied. We pointed out that both machinery and material were responsible for the wear of the extruders and moulds and the high proportion of waste material. We recommended that the company insist on receiving a better quality of granules and that the machinery should be overhauled to reduce backlash and play between extruder and moulds.

5. Assistance was given on the layout of an extension project of the Metal Construction and Mechanical Industries Co. in Adra. We wrote to numerous suppliers and asked them to provide the company with technical information and prices. The characteristics and prices of all burners were compared to make the choice of burner easier.

6. At the request of the Office of the Prime Minister, an inspection was performed of the biscuit oven at the Camelia Biscuit Factory of the Damascus Company for Food Industry. This oven was overheated and heavily damaged and caused the interruption of production for several months. In our report we

recommended eight technical measures to repair the oven and to prevent the recurrence of such incidents.

7. Consultancy services were requested by the Arab Timber Manufacturing Company, Lattakia, regarding heating problems. The installations were inspected and the problems discussed with the technical staff. The supplier of the presses was contacted for details about the press construction. We suggested installing a condensor for technical and economic reasons and submitted a number of recommendations for eliminating deficiencies. At our next visit to the factory we found the press heating system in operation, and no difficulties were reported.

8. In the Damascus Factory No. 1 of the Modern Conserves and Agricultural Industries Corporation, a list was made of all laboratory equipment available and advice was given on supplementary equipment. Recommendations were made regarding the proper installation and maintenance of laboratory equipment.

9. The management of the Canning Factory at Jable expressed their need for a production programme better suited to the raw materials available locally. We were asked for advice on production of orange marmalade and prepared recommendations for such production, suggestions for recipes, and production procedures.

10. Visits were paid to the Biscuit and Chocolate Factory, Aleppo, the Camelia Biscuit and Chocolate Factory, Damascus, and the Ghraoui Biscuits and Chocolate Factory. A series of experiments were made using different types of hydrogenated fats and different types of recipes. These experiments included pilot plant trials at the Centre and in the factory, organoleptic evaluations of the experimental products and gas chromatographic analysis of the different fats in use.

11. The industrial companies producing vegetable oils in Aleppo and Homs were visited. We carried out gas-chromatographic analysis of samples from refined cotton seed oil and from the hydrogenated product "Vegetamine".

12. The Onion and Vegetable Dehydration Factory, Salamiyeh, was visited.

13. The sugar factories in Homs and Damascus were visited. The enforcement of measurements of process and product quality control was very moderate, which made the steering and optimizing of processes very difficult. The factories

requested the Centre to verify their own control results and to provide assistance in developing their control systems.

14. The milk sterilizing plant in Damascus was visited. Detailed recommendations were prepared and forwarded to the plant management. These included an easy method to detect whether raw milk from farmers has been mixed with dehydrated dry milk powder; methods to determine the rest of the concentration of chlorine in water; rapid methods to detect traces of antibiotics in raw milk; and recommendations on literature available on flavoured milk.

15. Assistance was given to factories producing food packaging materials. Technical specifications and methods of quality control for tinplate, can lacquers and can-lid lining were recommended. A system for routine control of can seams was also recommended. The Organization of Food Industries was supplied with the production capacity and equipment cost of different types of factories (automatic and semi-automatic) for the production of empty cans.

16. Assistance was given in the planning of a continuous steel casting line for the new scrap melting plant at the Steel Rolling Mill, Hama.

17. Assistance was given to the Barada Cable Factory and Refrigerator Company, Damascus.

18. Assistance was given to the Electrical Motor Factory, Lattakia.

19. Assistance was given to the Oriental Underwear Manufacturing Company, Damascus.

20. Assistance was given to the Hama Cotton Yarns Corporation and Wool Grading Centre.

Annex XIII

QUALITY CONTROL ACTIVITIES

1. A programme of in-plant quality control was recommended to the Modern Cans and Agricultural Industries, Damascus.
2. A quality control programme for the production of empty cans and various canned food products was prepared.
3. A quality control programme for the production of orange marmalade was recommended at Jable Canning Factory.
4. Quality control of cables was undertaken at Cable Factory, Damascus.
5. Assistance was given to the Arab Timber Company, Lattakia, in the installation of a quality control laboratory.
6. Boiler feed-water quality control and on-site training were provided at Hama Vegetable Oil Factory.
7. Cement analysis and quality control and on site training were provided at Lattakia Cement Factory.
8. A quality control system was set up at the Fertilizer Factory, Homs.
9. A lecture on quality control was given at the Agricultural Research Institute, Douma.
10. The quality control of paper was undertaken.
11. Codes of Practice for analysis of iron ores were prepared.
12. A Syrian Draft Standard for quality control using polarography/voltametry was formulated.
13. Quality control of soaps was undertaken by analysing their fatty acid composition using the GC technique.
14. Quality control of semi-industrial scale-produced pectins was performed, using polarometry and Kjeldahl analysis.
15. Quality control of steel building materials was performed using Ströhlein C-S determinations.
16. Industrial-water quality control was provided for the Hama Tyre Factory.
17. Assistance was given to a textile laboratory in cotton-wool analysis and quality control.



Annex XIV

PREFEASIBILITY AND FEASIBILITY STUDIES

Prefeasibility studies

Trisodium polyphosphate plant using phosphoric acid and soda ash

Sodium sulphate plant using gypsum and soda ash

Nitrogen fertilizer plant (ammonia-urea)

Machine-tool factory

Five shoe factories

Vegetable-oil solvent-extraction plant

Feasibility studies

The establishment of a nitrogen fertilizer plant (ammonia-urea)

Triple-superphosphate plant at Homs

Sugar plant at Tel Salhab

Rubber-tyre production plant

Annex XV

TECHNICAL CONSULTATIONS ON NEW PROJECTS

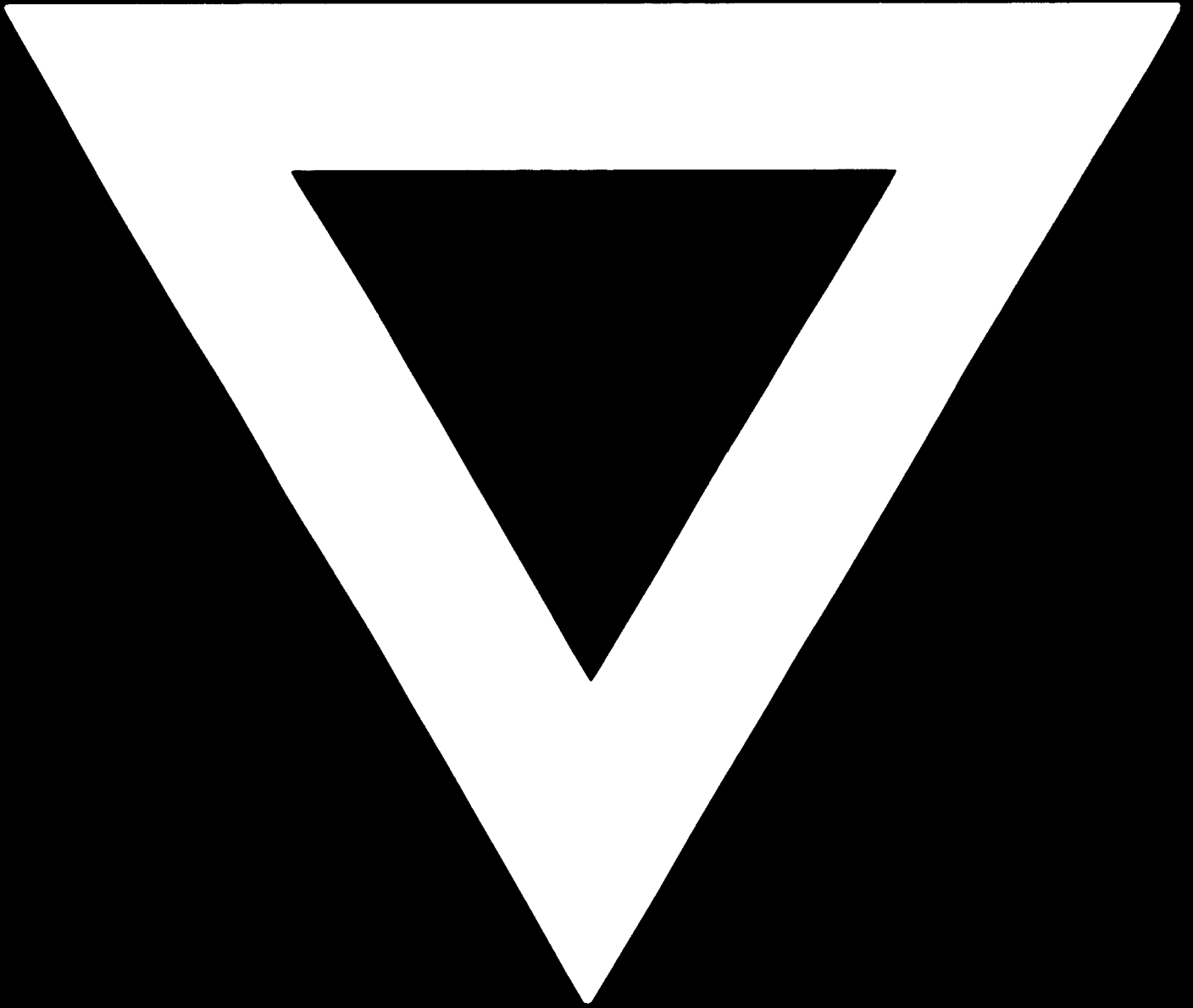
The following list indicates the assistance rendered to some important projects:

1. Ammonia-urea project. The consultation covered capacities, feedstock, products and their specifications, choice of site, the main features of the appropriate technology for process plant and off-site facilities. The consultation also extended to discussions with firms regarding their technical offers, problems of storage capacities, pollution etc. Consultation was later extended to include negotiating the commercial offer.
2. Triple-superphosphate plant at Homs. Consultation covered almost the same topics as in the ammonia-urea project.
3. Pulp and paper mill at Deir-es-Zor. Consultation covered almost the same topics as mentioned in the previous projects.
4. Triple-superphosphate plant at Deir-ez-Zor. Consultation covered the technology of the process, off-site facilities, and storage capacities.
5. Soda-ash and caustic-soda project. Consultation covered the site, feedstock, capacity, and main features of appropriate technology. The project was postponed.
6. Rubber tyre project at Hama. Assistance was given concerning the general layout of the plant.
7. Calcium carbide project. Assistance was given regarding the capacity of the plant, raw materials, and advice was given concerning the doubtful economic feasibility of the project.
8. Sugar manufacturing factories at Tel Salhab. At the request of the Minister for Planning Affairs studies were made for the installation of four sugar factories at Tel Salhab.
9. Committee for small projects with quick return. The Project Manager was nominated to this committee by the Minister of Planning. Various small projects were studied, including the production of printing ink, writing ink, and chalk.

10. The Project Manager was appointed by the Minister of Industry to preside over a committee that studied projects that were not included in the Fourth Five-Year Plan, such as the production of soda ash, caustic soda, and calcium carbide, the expansion of a paints factory, and the manufacture of rubber belts.



**C-700**



**78.12.12**