



TOGETHER
for a sustainable future

OCCASION

This publication has been made available to the public on the occasion of the 50th anniversary of the United Nations Industrial Development Organisation.



TOGETHER
for a sustainable future

DISCLAIMER

This document has been produced without formal United Nations editing. The designations employed and the presentation of the material in this document do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations Industrial Development Organization (UNIDO) concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries, or its economic system or degree of development. Designations such as “developed”, “industrialized” and “developing” are intended for statistical convenience and do not necessarily express a judgment about the stage reached by a particular country or area in the development process. Mention of firm names or commercial products does not constitute an endorsement by UNIDO.

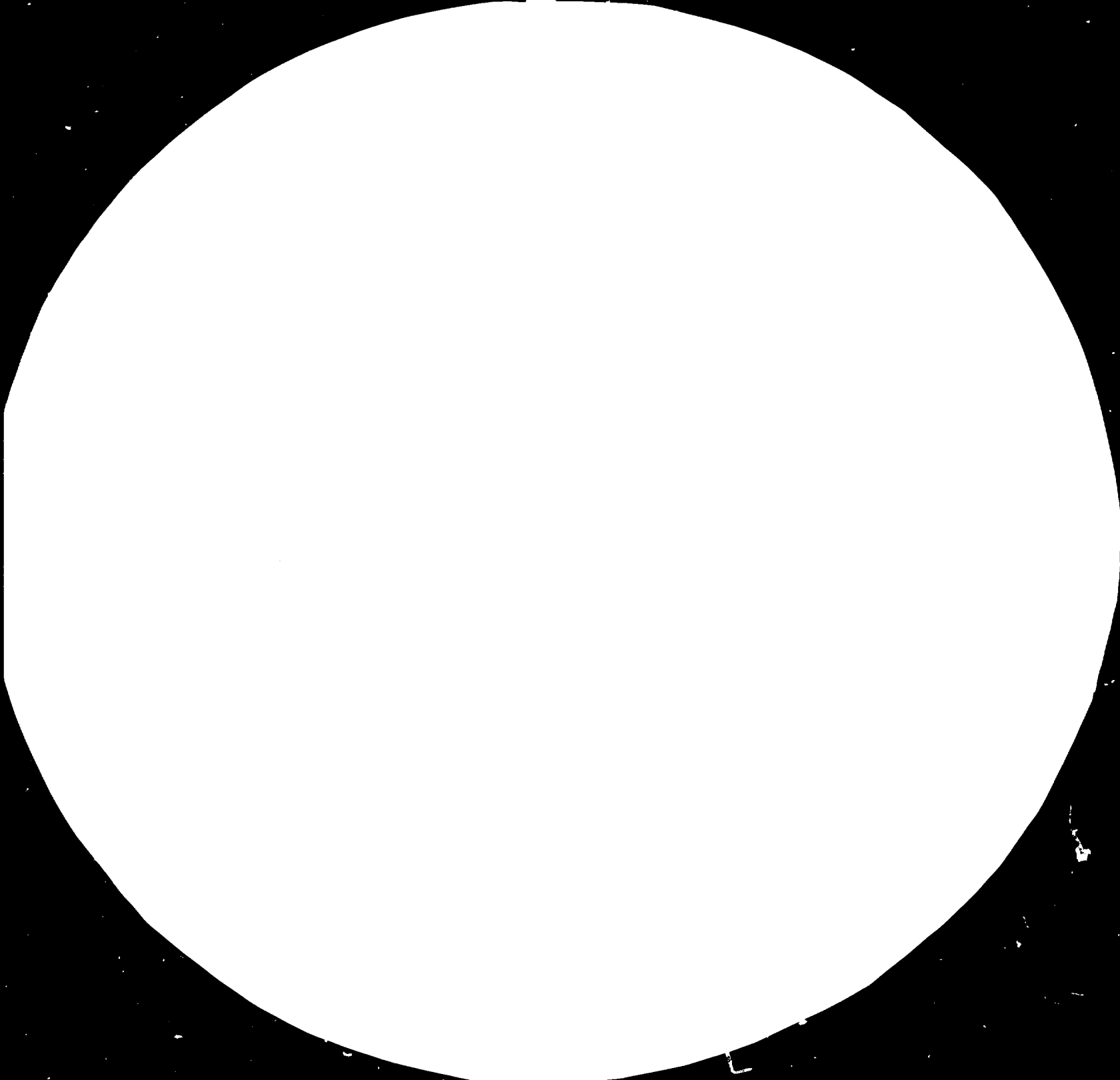
FAIR USE POLICY

Any part of this publication may be quoted and referenced for educational and research purposes without additional permission from UNIDO. However, those who make use of quoting and referencing this publication are requested to follow the Fair Use Policy of giving due credit to UNIDO.

CONTACT

Please contact publications@unido.org for further information concerning UNIDO publications.

For more information about UNIDO, please visit us at www.unido.org





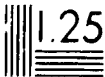
1.0 2.5

1.1 2.2



2.0

1.8



Visual acuity is the ability to resolve detail. It is measured in terms of the minimum angle of resolution (MAR) of the eye. The MAR is the angle subtended by the two lines of a resolution test pattern at the eye. The MAR is the reciprocal of the spatial frequency of the test pattern. The spatial frequency is the number of cycles per degree of visual angle. The MAR is the angle subtended by the two lines of a resolution test pattern at the eye. The MAR is the reciprocal of the spatial frequency of the test pattern. The spatial frequency is the number of cycles per degree of visual angle.

RESTRICTED

12556

DP/ID/SER.B/403
2 June 1983
English

Turkey.

ASSISTANCE TO THE NATIONAL PACKAGING CO-ORDINATION COMMITTEE
ON SETTING UP A PACKAGING LABORATORY

DP/TUR/75/056

TURKEY

Terminal report*

Prepared for the Government of Turkey
by the United Nations Industrial Development Organization,
acting as executing agency for the United Nations Development Programme

Based on the work of Gilden Tarhan,
National Project Co-ordinator

United Nations Industrial Development Organization
Vienna

* This document has been reproduced without formal editing.

7.83-56743

TABLE OF CONTENTS

	<u>Page</u>
I SUMMARY	4
II INTRODUCTION	5
A. Institutional Framework	5
B. The Structure of the Packaging Centre	5
III OBJECTIVES AND LOGIC OF THE PROJECT	7
A. Immediate Objectives	7
B. Development Objectives	7
C. Background and Justification	7
IV ACTIVITIES CARRIED OUT AND OUTPUTS PRODUCED	9
A. Experts	9
1. Packaging Expert (11-01)	9
2. Testing Expert (11-02)	10
3. Research and Development Mechanical Testing Expert (11-03)	11
B. Training Provisions	12
1. Study Tours (32-00)	12
2. Fellowships	13
C. Equipment	14
1. UNIDO-Provided Equipment	14
2. TSE-Provided Equipment	15
V ACHIEVEMENT OF IMMEDIATE OBJECTIVES	15
VI UTILIZATION OF PROJECT RESULTS	17
VII FINDINGS	18
VIII RECOMMENDATIONS	18

APPENDICES

Page

1	JOB ACTIVITIES OF THE PACKAGING EXPERT (11-01)	19
2	JOB ACTIVITIES OF THE TESTING EXPERT (11-02)	20
3	WORK PLAN FOR THE UNIDO REPORT, DR. SCHMIDT (11-03)	22
4	INSTITUTIONS AND ESTABLISHMENTS IN EUROPE VISITED IN NOVEMBER 1977 - JANUARY 1978 BY CHEM. ENG. MS. WYLDON BARHAM AND MECH. TECH. MR. SAUJITS AGAR	23
5	INSTITUTIONS INCLUDED IN THE TRAINING PROGRAMME OF CHEMIST, MR. HIGAN SAITH AGAR	24
6	LIST OF THE ESTABLISHMENTS INCLUDED IN THE FELLOWSHIP PROGRAMME OF HEAD OF PACKAGING CENTRE	25
7	UNIDO-PROVIDED EQUIPMENT	26
8	EQUIPMENT PURCHASED LOCALLY	27
9	EQUIPMENT MANUFACTURED AT THE TSE WORKSHOP	28
10	EQUIPMENT TRANSFERRED FROM OTHER TSE LABORATORIES	29
11	EQUIPMENT COMMONLY USED WITH OTHER TSE LABORATORIES	30
12	STANDARDS PREPARED BY THE STANDARD PREPARATORY COMMITTEE	31
13	PAPERS GIVEN IN SEMINARS	32

I SUMMARY

The Turkish Standards Institution (TSE) had taken the initial steps to establish a packaging centre in 1965, realizing the fact that rapid growth of the Turkish economy requires adequate development of the packaging industry to satisfy the needs of the home and export markets. Standardization, based on the results of testing chemical, physical and mechanical properties of packaging materials and containers, has been regarded as one of the important tools in the improvement of package quality.

However, due to tight finance resources the establishment of the Packaging Centre could not start until 1977.

In 1977 the project document DP/TUR/75/056 "Assistance to TSE in the Establishment of a Packaging Centre" was signed by the Turkish Government and UNIDO as the executing agency, and approved by UNDP. In the same year the project activities were started and were completed at the end of 1982.

During this period the Packaging Centre began to conduct tests on various packaging materials and containers such as paper, corrugated board, corrugated board boxes, laminated aluminium foils, cans, glass bottles, plastic cases, polystyrene coated with paper, cement bags, etc. Some of the tests mentioned above were carried out to determine specifications for preparing standards and the others were carried out to check the conformity of the product to the standards.

In addition, five papers on the subject of packaging were presented by UNIDO experts and national staff during the seminars.

The activities of the Packaging Centre, which have been realized to the present time, following the recommendations of the UNIDO experts and evaluation of the information gained during the fellowship programmes, are given in detail in the relevant parts of the report.

With the establishment of the Packaging Centre there has been great movement in attacking the problems in the field of packaging. However, some more time and additional support are necessary for the Packaging Centre to reach its aimed state.

II INTRODUCTION

A. Institutional Framework

TSE, established by law number 132 in 1960 as an autonomous public institution, is the only national agency authorized to prepare national standards as deemed necessary and to stimulate the implementation of them. In order for the Government to make a standard compulsory, it has to be a Turkish standard.

Up to this date, TSE has prepared and published nearly 3,800 Turkish standards and 639 of them are compulsory. Most of the compulsory standards cover consumer goods and export products, including some provisions for packaging as well.

The following four laboratories exist in addition to the Packaging Centre in TSE:

- Chemical Materials Laboratory:
- Mechanical and Civil Materials Laboratory:
- Electrical Laboratory:
- Electronics Laboratory.

The activities of the abovementioned laboratories are:

- to conduct research work required during the preparation of standards.
- to conduct tests required for Government inspections of standards; tests relevant to implementation of conformity to Turkish standards, and tests requested by various organizations according to private codes of practice.
- to act as an "Arbitrator Laboratory" in cases where results between the different laboratories will differ.

B. The Structure of the Packaging Centre

The Packaging Centre is established on an area of approximately 3,000 m² (3 floored building on an area of 1,000 m²) consisting of the following departments:

- Packaging Materials and Retail Packages Testing Laboratories (chemical, physical and physico-chemical tests on packaging materials and retail packages are conducted).
- Transport Packages Testing Laboratory (transport conditions are simulated for testing the transport packages).
- Documentation and Training Department (consists of two classrooms and one library).

The planned activities of the Packaging Centre are as follows:

- conduct research work of packaging materials and packages required during the preparation of standards.
- conduct tests on packaging materials and packages : for Government inspections of standards and to check conformity to the relevant standards.
- compile and analyse statistical data relating to the packaging industry.
- formulate a long-range programme of packaging development based on the assessment of local quantitative and qualitative demands for packaging materials and machines as well as foreign market requirements.
- co-ordinate the implementation of the programme with the ministries and other responsible organizations.
- promote packaging in the country by organizing seminars, congresses and exhibitions.
- give information and documentation services.
- act as an "Arbitrator Laboratory" in packaging cases when requested.

The extent to which the abovementioned activities could, till now, be realized, is illustrated in other parts of the report.

III OBJECTIVES AND LOGIC OF THE PROJECT

A. Immediate Objectives

Assistance in the:

- establishment of a Packaging Centre at the TSE.
- training of the counterpart staff in the effective operation of the centre.
- training of the TSE staff in the application of packaging media in the food and non-food sectors.
- start of applied research and development work.

B. Development Objectives

Assisting the industry in its packaging problems through a well-established centre, and undertaking research/development work to overcome these problems, thus contributing to the overall improvement of quality and standards of packaging for home and for export markets.

C. Background and Justification

In 1965, the lack of packaging within the Turkish economy was definitely observed and TSE had been in contact with OECD. In the same year, Mr. J.B. Verlot, President of the Laboratoire General pour Emballages, in Paris, was sent through the OECD. He elaborated some principal points concerning the Packaging Centre.

In 1966, a second expert from OECD, Mr. G. Jouhaud, arrived at TSE and prepared plans for the arrangement of the testing equipment in the packaging laboratory. In October 1966, Mr. Jouhaud came for a second time and, together with people from TSE, a project document relating to the Packaging Centre, was prepared. The following points were mentioned in the document:

- It is necessary to improve the quality of packing in order to bring Turkish products (especially agricultural products which have an acceptable quality, but poor presentation and inadequate packing) up to a competitive level in the world market.

- The most practical means of achieving this goal is to standardize packaging and the methods of presenting products.
- TSE is well qualified to undertake this task and is actively engaged in this work by closely co-operating with the International Standardization Organization (ISO).
- Standardization needs a means of control in order to be effective : one such means of control in the field of packing would be the establishment of a specialized study and control laboratory.

With this project document TSE tried first of all to interest the State Planning Organization (SPC) and then UNIDC-UNDP Office in Ankara, but both attempts were unsuccessful.

In 1973 the project was reviewed and it was proposed to the SPC to request UNDP assistance but this was again unsuccessful.

In addition to these efforts by TSE, in 1970 a packaging consultant group from UNIDO made some studies in Turkey on packaging under the leadership of Mr. A. Soltan. Mr. A. Soltan returned in 1975 and prepared a report in which he mainly recommended the following points:

- In order to up-grade the quality of packaging in Turkey, especially for export, appropriate standards should be established, precisely defining physical and functional properties of packaging materials and ready-made packages, in conformity with international regulations. To achieve this goal, a packaging testing laboratory should be established at the Turkish Standards Institution with the assistance of UNIDO.
- Development of manufacturing industries and distribution of commodities increase the demand for more and better packaging materials, machines and know-how. On the other hand, it is necessary to keep the costs of packaging at an economically acceptable level. To deal with the resulting problems, long-range policies and a programme in packaging development,

correlated with the development of other economy sectors, should be devised in Turkey, and co-ordination of activities established in this field on a national level.

It is considered to set up a Packaging Co-ordination and Development Committee, possessing a character of a national packaging authority, as a suitable way of carrying out the above duties.

In addition Mr. Soltan prepared a draft of the project document. Since the financial resources were tight at that time, the project activities could not be started.

In 1977 the necessary financial resources could be supplied and the project document DP/TUR/75/056 "Assistance to TSE in the Establishment of a Packaging Centre" was signed.

IV ACTIVITIES CARRIED OUT AND OUTPUTS PRODUCED

Major activities of the project could be carried out within the time limits mentioned in the latest revision of the project document; there was no factor which facilitated or impeded the implementation of the project.

Each major activity and its output is mentioned hereunder:

A. Experts

1. Packaging Expert (11-01)

The packaging expert, Mr. Klaus Luxenhofer, arrived at TSE in April 1977 and left in June 1977.

He made a survey on the packaging industry in Turkey in order to form an idea of how best to establish the new Packaging Centre. The activities mentioned in Appendix 1 were then carried out, with the exception of point 6 (due to the lack of time).

The recommendations he mentioned in his technical report mainly cover the following points:

- First of all the Packaging Centre must deal with the studies of tin plate, paper/board and plastics in co-operation with the other establishments working on these subjects.

- An "Advisory Board" must be established at TSE to be in contact with industry and governmental and semi-governmental establishments.
 - The financial sources are too short for supplying the minimum equipment and staff necessary for the Packaging Centre to fulfil all of its planned activities. In 1975, US\$ 314,000 was foreseen necessary for the project, however, it had to be decreased to US\$ 162,000 in 1977.* Further assistance must be supplied in future within the tight limits of the project; at first the head of the TSE-workshop, a very skilled technician together with the head of the Packaging Centre or with the future head of the testing sub-department, should be sent for training within the fellowships programme.
- * In the final revision of the project this amount changed to US\$ 167,997.

2. Testing Expert (11-02)

The testing expert, Mr. P.V. Narayanan, arrived at TSE in December 1979 and left in May 1980.

The activities mentioned in Appendix 2 were carried out. He made the following recommendations, which he mentioned in the technical report:

- One of the main objectives of the project is to establish the necessary testing facilities at the Institute to enable to grant "Quality Mark TSE" to improve the standard of packaging. To extend such effective service on an industry-oriented basis, the laboratory needs to be further equipped.
- Some important reference books in the field of packaging must be supplied and the Institute must also subscribe to a few useful technical magazines.
- Fellowship must be used for the project staff to be trained.
- The technical staff of the packaging laboratory must visit as many factories as possible.
- Small projects must be undertaken on a continual basis.

- Preparatory studies must be carried out before the planned fellowship programmes.
- A "Packaging Manual" must be prepared.
- A "Packaging Machinery and Testing Equipment Manual" could also be undertaken.
- Standards must be prepared for the main packaging materials.
- The calibration and maintenance of the equipment must be undertaken on a regular basis.
- Studies to be made on packaging of food products such as fruits and nuts.
- It is necessary to make industry and other institutions aware of the establishment of the packaging laboratory and its functional role.
- The functions of the packaging laboratory will cover testing, technical consultancy service, training and information dissemination. It is therefore felt more appropriate to name the laboratory as "Packaging Centre".

3. Research and Development Mechanical Testing Expert (11-C3)

The Research and Development Mechanical Testing Expert, Mr. Ernst R.W. Schmidt, arrived at TSE in September 1982 and left in October 1982.

The activities carried out during his presence at TSE are given in Appendix 3.

He recommended the following points in his technical report:

- Completion of the adjustment of the existing drop table and dolly on the inclined plane.
- Completion of the existing test equipment by purchasing a compression tester, a vibration table, measuring equipment for impacts and vibrations for use in the laboratory and in the field, a drop hammer and a rain chamber.

- Be in contact with industry who answered the questionnaire.
- Collect test specimens from a representative number of producers of packaging materials for testing.
- Perform investigations on distribution systems.
- Install an information system about the distribution systems.
- Perform standardizations concerning, with priority, the classification of corrugated board produced in Turkey, applying the foreign standards and specifications.
- For the packaging laboratory to be capable to implement these recommendations within some years, it requires additional help and additional staff members.

B. Training Provisions

1. Study Tours (32-00)

In November 1977, following the recommendation of Mr. Luxenhover, Chemical Engineer, Ms. Gulden Tarhan (Head of the Packaging Centre) and Mechanical Technician, Mr. Satilmis Acar (Head of the TSE Workshop), were sent to the packaging institutions and establishments in the European countries given in Annex 4. The study tour was over in January 1978, the total period being six weeks. The aim of the study tour was mainly:

- To observe all the test equipment used in the packaging laboratories of different European countries and to prepare a list of the equipment that must be purchased, with priority, for the TSE Packaging Laboratory.
- To inspect and acquire information regarding the instruments and equipment planned to be installed at the TSE Workshop. Based on the knowledge and experience acquired during the study tour, the following activities were carried out:
 - a. determination of the first group of equipment to be purchased.
 - b. preparation of the specifications of the equipment.

- c. ordering of the equipment through UNIDO by giving specifications and manufacturers' addresses.
- d. preparation of the projects of the big drop table and inclined impact tester, selection of construction material and commencement of construction.
- e. determination of the dimensions of the concrete blocks needed to separate five sets of equipment from the building foundation.
- f. construction of concrete blocks.

2. Fellowships

a. Testing of Materials for Packaging for Approved Standards (31-02)

In May 1981, Chemist, Mr. Hasan Salih Acar (Head of the Testing Laboratory), was sent to the institutions given in Appendix 5 for ten weeks.

The aim of the fellowship programme was mainly to study the following topics:

- Test methods applied to packaging materials.
- Equipment for testing.
- Significances of the test methods and selection of the proper test methods.
- Application of the tests.

Based on the knowledge and experience acquired during the fellowship programme the following activities were carried out:

- Conduction of tests on several different types of corrugated boards and evaluation of the test results.
- Conduction of tests on several different types of paper.
- Conduction of a training programme on tests regarding corrugated boards to a firm - user of this material.

b. Organization and Management of Packaging Centre (31-01)

In August 1981, the Head of the Packaging Centre, Ms. Gulden Tarhan, visited the establishments given in Appendix 6, the duration being a total of six weeks.

The aim of the fellowship programme was mainly to acquire as thorough a knowledge as possible on the following subjects in the well-established packaging centres in the developed countries:

- Organization and management practices.
- Financing and budgeting procedures.
- Planning, programming and evaluation of research work, both short-term and long-term based.
- Testing of packages and packaging materials and specifications.
- Information services and courses.

Based on the knowledge and experience gained during the fellowship programme the organization of the packaging centre is planned as follows:

- To establish a library (list of the essential books has been prepared).
- To subscribe to some of the technical periodicals, and prepare abstracts from them.

(TSE has already subscribed to one of the periodicals and abstract preparation activity has begun and is in the pilot state.)

The packaging courses attended during the training programme will be helpful while preparing the schedule of the courses.

c. Equipment

Equipment present in the Packaging Centre is supplied from different sources:

1. UNIDO-provided equipment (Appendix 7).

2. TSE-provided equipment:

- Equipment purchased locally (Appendix 8).
- Equipment manufactured at the TSE Workshop (Appendix 9).
- Equipment transferred from other TSE laboratories (Appendix 10).
- Equipment commonly used with other TSE laboratories (Appendix 11).

With the present equipment, the following tests can be performed:

- Tests on packaging materials and retail packages.
- Paper, paper-board, corrugated board (however, some test equipment like tensile tester, tear tester, guillotine, pick resistance tester, plybond adhesion tester, etc. is missing).
- Plastic films and cups (part of the tests are possible on this material, for the remainder of the tests to be performed, additional equipment is necessary).
- Timplates and cans (partly).
- Glass containers (except profile projection, thickness distribution and coating measurement tests).
- Aluminium foil and laminates (except tensile and elongation test and printability test).
- Tests on transport packages: Drop test, inclined impact test, stacking test and conditioning.

V ACHIEVEMENT OF IMMEDIATE OBJECTIVES

The immediate objectives could be achieved to a great extent as explained in the following:

The first immediate objective was to assist in the establishment of a packaging centre at the TSE. At the end of the project a packaging laboratory functioning as a packaging centre was established at the TSE. The activities carried out by the packaging laboratory till now can be summarized as follows:

- The establishment of the packaging laboratory provided for the establishment of the standard preparatory committee working on the standards of packaging materials and packages. This group has prepared five standards till now, and is working on thirteen standards (Appendix 12).
- During the preparation of these standards the packaging laboratory carried out tests on glass containers, paper and laminated aluminium foils. They also conducted tests on the following packaging materials and packages:
 - a. For the Government inspections of conformity to standards - hermetically closed metal containers (two firms).
 - b. On requisition of firms to have "TSE" quality mark or quality certificate - adhesives, various kinds of paper used for packaging, PE bottles, corrugated boxes and glass bottles (14 firms).
 - c. On requisition of firms to learn the specification of the products they manufacture or use - cement bags, aluminium laminated foils, corrugated board boxes and polystyrene coated with kraft paper.
- All the addresses of the firms manufacturing packaging materials and packages were gathered together to prepare a catalogue.
- A questionnaire was prepared and sent to 300 firms in order to be in contact with the packaging industry.
- During the preparation of the report on packaging for the next five year plan of Turkey, the co-ordination of the committee was provided.
- In various seminars, (Appendix 13) some papers were given.
- A plan to establish the Information and Documentation Service has been formulated and the initial steps taken, however, this activity has not been able to be completed as yet.

The second and third objectives of the project were training of the TSE staff in:

- The effective operation of the Centre.

- The application of packaging media in the food and non-food sectors.

As mentioned above, the packaging laboratory has started to conduct a lot of activities.

The TSE staff has been trained during fellowship programmes and expert visits, on the effective operation of the Centre and the application of packaging media in general, to a great extent. However, some more detailed training, especially in the application of packaging media in the food sector, and tests on transport packages will be very helpful.

The last immediate objective of the project was "assistance in the start of applied research and development work". Small-scale projects on corrugated board boxes and paper were conducted relating to this subject. However, applied research and development work must be improved.

VI UTILIZATION OF PROJECT RESULTS

The packaging laboratory started to conduct tests on various packaging materials and packages.

The required tests, during the preparation of packaging standards, can be conducted within the limits of the available equipment. Preparation of standards on the specifications and test methods of the main packaging materials and packages in Turkey has been planned and started. As soon as the standards being worked on are completed, the manufacturers and users of these materials will be aware to check these materials and to better learn the properties of them. This consciousness will lead to the improvement of the quality of packaging in Turkey.

On the other hand, when the planned information and documentation service of the packaging laboratory is completely established, the manufacturers and users of packaging materials and packages will be aware of all the new approaches and technology in this field.

As the testing facilities of the laboratory develop, it will be possible to conduct more tests.

Some time and more training in detail on each of the packaging materials will lead to research and development work being undertaken in this field.

VII FINDINGS

On completion of the project:

- A packaging laboratory was established.
- Test methods on various kinds of packaging materials and packages were learned during the expert visits and fellowship programmes.
- Most of the tests had been conducted within the limits of the equipment available.
- An approach was learned for the establishment of the information and documentation service. This approach will be applied in a very short time.
- Contact had been established with industry during the expert visits, which contributed to a great extent in making them aware of the packaging laboratory.
- Based on the recommendation of UNIDO expert, Mr. Luxenhofer, it is planned to establish an "Advisory Board" at TSE to be in contact with industry, governmental and semi-governmental establishments.

VIII RECOMMENDATIONS

The project achieved, to a great extent, its objectives.

However, for the consolidation and further development of the packaging laboratory, a second phase of the project must be prepared to mainly cover the following activities:

- More technical assistance - to establish the Food Packaging Department and to build up the training capacity of the Packaging Laboratory.
- Further development of the testing capabilities of the laboratory.

APPENDIX 1

JOB ACTIVITIES OF THE PACKAGING EXPERT (11-C1)

1. To make a list of equipment and apparatus necessary for the Packaging Centre.
2. To make a plan for the arrangement of this equipment in the main testing hall, in particular the heavy testing apparatus.
3. To select equipment which can be built in Turkey and that which will be imported.
4. To establish a personnel organization scheme for the Packaging Centre.
5. To formulate fellowships.
6. To devise a training programme for persons from industry, ministries etc.

APPENDIX 2

JOB ACTIVITIES OF THE TESTING EXPERT (11-02)

1. To study the present status with regard to equipment, fellowships, experts, building and laboratory set-up.
2. Identification of further equipment needed and action planned.
3. Identification of equipment not ordered, assistance in drawing up specifications and suggestions as to new equipment needed. Assistance in processing fellowship forms.
4. The planning of the layout of laboratories with counterpart staff.
5. Installation, as much as possible, of equipment and assistance to counterpart staff on operation, calibration and maintenance. Listing of other laboratory items required, such as glassware, chemicals and miscellaneous items.
6. To conduct a series of explanatory technical discussions, sessions for training and benefit to counterpart staff on various aspects of packaging, packaging materials, material and package testing, test procedures and evaluation of test results, significance of tests and specific case studies.
7. Preparation of laboratory test procedures for testing of plastic materials.
8. Preparation of reference standards guide for various tests.
9. Preparation of a ready reckoner on "Properties/Tests for packaging materials and their significance".
10. To plan, organize and help counterpart staff in tests/equipment based laboratory projects, to study the use of equipment and to analyse test results and their relevance to end use applications.
11. To draw up an outline for the preparation of a "Packaging Manual" and "Packaging Machinery Manual" and discuss methodology to be adopted for compilation of the information.
12. Preparation of test record sheets and time/cost sheet.

13. Identification of equipment that could be manufactured at TSE Workshop and/or locally and to render possible assistance.
14. To assist in the preparation/participation of technical seminars in packaging and provide background write-ups.
15. Preparation of final report.

APPENDIX 3

WORK PLAN FOR THE UNIDO EXPERT, MR. SCHMIDT (11-C3)

- September 6 - 7 Meeting with TSE personnel, visits of the different laboratories to ascertain which tests for transport packages could be performed. (See preliminary report concerning the equipment at the disposal of the packaging laboratory.)
Preparation of the work programme taking into consideration the following conditions:
- a. Mr. Salisbury, expert for export packaging, arriving 3rd of October, so that after this date visits to producers and users of packages could be performed together, marked by (S).
 - b. The counterpart for transport packaging available after 15 September.
- September 8 - 10 Introductory discussion of distribution processes and hazards. Preparation of letters and questionnaires and visits to transporters.
- September 13 - 17 Further discussion of distribution hazards and visits to transporters. Commencement of discussion and performance of testing methods for distribution packaging - compression and stacking tests.
- September 20 - 24 Further discussion and use of testing methods - impact and vibration tests.
- October 1 Discussion of classification of goods to be packed.
- October 4 - 8 Discussion of the functions of packaging materials and auxiliary packaging means. Methods of realizing and standardizing them.
- October 11 - 15 Visits to ports and factories and seminars in Izmir and Istanbul.
- October 18 - 22 Discussion of the results of the visits and seminars. Seminar in Ankara.
- October 25 - 27 Final report.

APPENDIX 4

INSTITUTIONS AND ESTABLISHMENTS IN EUROPE
VISITED IN NOVEMBER 1977 - JANUARY 1978
BY CHEM. ENG. MS. GULDEN TARHAN AND
MECH. TECH. SATILMIS ACAR

WEST GERMANY (15 November 1977 - 10 December 1977)

1. MULTIVAC Vakuum - Verpackungs Maschinen - Wolfertschwenden.
2. Fa. 4P NICOLAUS - Kempten.
3. LEBENSMITTELINSTITUT - München.
4. Fa. ZWICK GmbH - Ulm - Einsingen.
5. Fa. KARL FRANK GmbH - Weinheim.
6. Fa. SCHENK AG, Darmstadt.
7. Fa. KALLE - Wiesbaden - Bibrich.
8. Fa. HOECHST AG, Frankfurt.
9. Fa. BRABENDER GmbH - Duisburg.
10. INSTITUT FUR EXPORT-VERPACKUNG - Hamburg.

DENMARK (12 December 1977 - 22 December 1977)

1. EMBALLAGEINSTITUTTET - Danish Packaging Research Institute, Copenhagen.
2. ELEKTRONIK CENTRALEN - Danish Research Centre for Applied Electronics.

BULGARIA (26 December 1977 - 7 January 1978)

1. Packaging Institute, Centre NIERA, Sofia.
2. Centre for New Commodities which belongs to the Ministry of Agriculture and Food Products, Sofia.

APPENDIX 5

INSTITUTIONS INCLUDED IN THE TRAINING PROGRAMME

OF CHEMIST, MR. HASAN SALIH ACAR

1. THE FINNISH PAPER AND PULP RESEARCH INSTITUTE
Helsinki/Finland.
2. FRAUNHOFER - INSTITUT FÜR LEBENSMITTELTECHNOLOGIE UND VERPACKUNG
München/Germany.
3. PIRA - THE RESEARCH ASSOCIATION FOR THE PAPER AND BOARD, PRINTING
AND PACKAGING INDUSTRIES.
England.

LIST OF THE ESTABLISHMENTS INCLUDED IN THE
FELLOWSHIP PROGRAMME OF HEAD OF PACKAGING CENTRE

NETHERLANDS

1. Institute TNO for Packaging Research, Delft.
2. NKC, Netherlands Calibration Service, Delft.
3. Central Institute for Nutrition and Food Research, TNO
(CIVO), Zeist.

U.S.A.

1. Rutgers - The State University of New Jersey, Piscataway.
2. Union Carbide Corporation, New Jersey.
3. Pratt Institute, New York.

APPENDIX 7

UNIDO-PROVIDED EQUIPMENT

- Dial Micrometer
- Dial Micrometer
- Water Vapour Permeability Testing Apparatus
- Gas Permeability Testing Apparatus
- Laboratory Sealer
- Salt Spray Test Chamber with Accessories
- Cold Chamber
- Polariscopes
- Strain Discs
- Compression Testing Machine with Accessories
- Puncture Tester
- Climatic Cabinet
- Glass Hydraulic Pressure Tester
- Glass Impact Tester
- Concora Medium Flutter
- Thickness Gauge
- Stiffness Tester
- Analytical Balance
- Top Loading Balance

EQUIPMENT PURCHASED LOCALLY

- Oven for general purposes.
- Oven for MWTR test.
- Glass Laboratory Wares.
- Chemicals.
- Water Demineralizer.
- Air Filter.

APPENDIX 9

EQUIPMENT MANUFACTURED AT THE TSE WORKSHOP

- Drop Table
- Inclined Impact Tester
- Stacking Loads
- Hood
- Wax Applicator
- Specimen Sampler
- MVTR Dishes
- Thermal Resistance Test
- Equipment for Glass Containers
- Verticality Tester for Glass Bottles
- Cobb Tester
- Can Leakage Tester

EQUIPMENT TRANSFERRED FROM OTHER TSE LABORATORIES

- Burst Tester
- Erichsen Deep Drawing
- Timous Olsen Metal Tensile Tester

APPENDIX 11

EQUIPMENT COMMONLY USED WITH OTHER USE LABORATORIES

- Gas Chromatography
- Double Fold Endurance Tester
- Vicat Softening Point

STANDARDS PREPARED BY THE STANDARD PREPARATORY COMMITTEE

A - Completed:

- Packaging - complete, filled transport packages compression test.
- Wooden cases - dimensions of rigid, rectangular shaped packages.
- Packaging - general principles, part 1 : choice of packaging.
- Packaging - general principles, part 2 : storage of packaging materials.
- Packaging - general principles, part 3 : marking and labelling.

B - Worked on:

- Glass Containers - dimensions, shapes, testing methods, classification (three standards).
- Laminated Aluminium Foils (four standards).
- Plastic Films and Containers (three standards).
- Wooden Crates (two standards).
- Paper used for packaging.

APPENDIX 15

PAPERS GIVEN IN SEMINARS

1. Standardization of Packaging Materials Used for Food (1980)
Ms. Gulden Tarhan, Head of Packaging Centre (7-8 May 1980),
Izmir.
2. Packaging - Integrating the Disintegrated
UNIDO Expert, Mr. P.V. Narayanan (7-8 May 1980), Izmir.
3. Marking and Labelling of Packages
Ms. Gulden Tarhan, Head of Packaging Centre (April 1982),
Ankara.
4. The Role of the Packaging Department to Promote Export by
Testing and Standardization
UNIDO Expert, Mr. E.R.W. Schmidt (October 1982), Ankara, Istanbul.
5. Application of Scientific Test Methods to Packaging Materials
UNIDO Expert, Mr. Salisbury (October 1982), Ankara, Istanbul.

